CORPORATE TAX AVOIDANCE AND PROFITABILITY FOLLOWED BY MERGERS AND ACQUISITIONS

Daniel Duarte [*], Victor Barros [**]

* ADVANCE/CSG, ISEG – Lisbon School of Economics and Management, Universidade de Lisboa
** *Corresponding author* ADVANCE/CSG, ISEG – Lisbon School of Economics and Management, Universidade de Lisboa
Contact details: ISEG, Rua Miguel Lupi, 20, 1249-078 Lisboa, Portugal

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Abstract

This paper aims to understand the change in corporate tax avoidance of acquirer firms following M&A deals. Several M&A features were tested in a sample which covers 391 European deals announced between 2005 and 2014. Overall, results suggest that there is no evidence of changes in acquirer's ETR following M&As. However, evidence was found of a decrease in acquirer's ETR of about 6.7% when the target firms report negative pre-tax income before the deal, and of 2.6% for domestic M&A. The decrease is increased to 7.9% if these characteristics are not mutually exclusive. Furthermore, it was found that acquirer's ETR decreases with profitability, which is more pronounced in the presence of M&A deals. The findings support the longstanding view that taxation may not trigger M&As, although significant tax savings appear to occur for certain M&A characteristics.

Keywords: Mergers and Acquisitions, Tax Avoidance, Cross-Border

1. INTRODUCTION

This study aims to examine whether the level of corporate tax avoidance increases following mergers and acquisitions (M&A) for firms on the buy side in European deals. Firms are increasingly inclined to search for more favourable tax treatments and are relocating operations and headquarters in order to achieve tax savings. One example is the success of Ireland in attracting businesses, with its 12.5% statutory corporate income tax rate, leading to a flow of "inversions", whereby firms with their headquarters in foreign countries move overseas to lower-tax jurisdictions. Several jurisdictions have responded by steadily decreasing statutory tax rates over the past two decades. However, the proliferation of tax avoidance strategies, especially from multinational firms, mainly arises from the tax rate-gap between countries (Schwarz, 2009; Huizinga and Laeven, 2008; Clausing, 2009). Nevertheless, tax avoidance strategies in M&As are not limited to tax inversion deals. While countries are lowering corporate tax rates in advanced, emerging, and low-income markets, parent firms from high tax jurisdictions engage in more tax avoidance strategies through income shifting with their affiliates to reduce the tax burden (Klassen and Laplante, 2012; Clausing, 2003).

A recent and much-criticised case was the announced $160 billion deal between Pfizer and Allergan in 2015-2016. The question that arises is, what was the rationale for the deal? Logic surmises that the deal was motived by operational synergies. However, in order to reduce its actual corporate tax burden with the deal, Pfizer planned to strategically move its headquarters from the US to Ireland through a "tax inversion" deal.[1] According to Fortune (2015), the M&A would reduce Pfizer's current ETR

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[1] The smaller firm, Irish-based Allergan would buy the larger firm, American-based Pfizer, maintaining the well-known Pfizer brand as the name.

of about 25% by more than a fourth, to 17% to 18% of combined ETR, with an estimated tax saving of around $1 billion annually with the tax inversion M&A deal. Therefore, it is hardly clear that the deal was driven by operational synergies resulting in the creation of the biggest drug making firm in the world. Instead, it looks clearly like a tax-motivated M&A. Once again, it is important to recall that this paper aims precisely to understand whether these firms actually decrease ETRs following European M&As, and to assess whether the decrease in ETRs is only derived from the deal. A paper by Belz et al. (2013) found a decrease of target's ETR by 3% following M&As, however, the focus is on target's ETR, rather than on the buy-side. Contrary to Belz et al. (2013), this paper aims to understand the effects of M&As on corporate tax avoidance and on the performance of acquirer firms.

The dataset comes from Thomson Reuters Eikon database, covering M&As announced between 2005 and 2014, where both acquirer and target firms have their headquarters in Europe. The final sample comprises 359 completed M&A deals from 16 different European countries, from 23 industries. Data from both target and acquirer firms were obtained from the same database and merged to a sample of 2,167 firm-year observations.

Overall, the findings suggest no evidence of higher levels of corporate tax avoidance following M&As, although the inconclusive results may be shaped by several features. First, a detailed analysis suggests that the effect of M&As on acquirer's level of corporate tax avoidance is more pronounced after the first year, during which acquirers decrease ETRs by about -2.0% derived uniquely from the deal. However, this result is not robust enough to support findings for acquirer firms similar to those of the paper of Belz et al. (2013) for target firms. However, results may be driven by the inability of acquires to achieve tax savings during the year when the deal occurs. Second, the empirical analysis suggests that acquirer's ETR is reduced by about 6.7% when the target firm reports negative pre-tax income in the year before the deal. Third, the analysis of cross-border versus domestic M&As is revealing, as, in contrast to prior empirical evidence (Belz et al., 2013, and Huizinga and Voget, 2009), acquirer's ETR is reduced by about 2.6% in domestic M&As. The findings are opposite to expectations and might be justified by the fact that tax loss carryforwards are more difficult to materialise in cross-border deals inside Europe. Combining domestic M&As with target firms that report losses, the results suggest that M&As amplify the effect on acquirer's ETR, as it falls about 7.9%.

Firms that exhibit higher ROE or ROA increase tax avoidance, especially when M&As occur. Profitability in both forms is a determinant of ETR, but it is more pronounced in decreasing acquirer's ETR in the presence of M&A deals. That is to say, more profitable acquirer firms are more able to increase the level of corporate tax avoidance when engaged in M&A operations. An increase in acquirer's ROE (ROA) by about 100 basis points reduces the ETR by 0.25% (1.0%) following the M&A. One justification for this is that profitable firms are more likely to manage the level of corporate tax avoidance while avoiding being under the scrutiny of the tax administration (Rice, 1992).

This paper contributes to the current literature for several reasons. Results found weak statistical evidence to support changes in acquirer's ETR derived from M&As, which is in contrast with Belz et *al.* (2013). Nevertheless, significant tax savings might occur for specific deals. The main policy implication of this study is at the European level, resulting from the fact that cross-border M&As within Europe have no effect on acquirer's ETR. The tax neutrality regime for merges introduced by Directive 90/434/CE, later reinforced by Directive 2005/56/CE, aimed to facilitate cross-border mergers. Our findings show whether tax inversion deals are limited in Europe by regulations that are already in place.

The paper proceeds as follows. The next section provides a brief overview of prior research and presents the research hypotheses. Thereafter, the construction of data and methodological approach is outlined. Section 4 presents the results, and the last section concludes by discussing our contributions.

2. LITERATURE REVIEW

Over the last years, mergers and acquisitions have increased significantly, both in value and number of transactions, increasing its importance as a form of business investment. The main reason pointed out in the literature for a firm to engage in M&As is the perception of an increase in profitability by the acquiring firm (Pautler, 2001).

M&As can generate synergetic gains through the reduction of operational costs and consolidation, leading to a greater market share and increases in revenues (Devos et al., 2008). M&As generate operational and financial synergies, and tax synergies can influence M&A operations. Nevertheless, tax issues have been largely ignored in the literature on M&As, including in the important research of Martynova and Renneboog (2008). Their study is focused on extensive literature related to the determinants of M&As and changes in performance derived from these deals. Martynova and Renneboog (2008) analysed the determinants of the five M&A waves and found common reasons for all waves. The authors pointed out managerial self-interest and hubris reasons as being motives for M&A activity. The paper of Ngueyn et al. (2012), using a sample of domestic acquisitions in the US, adds that M&As may also be motivated by market timing, agency, or hubris reasons as a response to economic or industry shocks. Francoeur (2007) found that M&As can effectively bring about efficiency gains and long-term value in cross-border M&As. Extant literature on the topic suggests that tax attributes can play an important role in M&A activity (Auerbach and Reishus, 1986, 1987, 1988; Hayn, 1989) and that these attributes are usually reflected in higher premiums paid by acquirer firms in M&A deals (Kaplan, 1989).

In the literature, several tax aspects at shareholder's level are considered to be drivers of M&As, namely: the form of transaction (Gilson et al., 1988; Erickson, 1998); the method of payment (Bierman, 1980), and; tax effects from dividend-paying firms (Bierman, 1980; Carleton et al., 1983). In the case of a cash transaction, target shareholders are immediately taxed on the gain resulting from the

deal. However, a paper by Sullivan (1993) found that target shareholders request higher premiums to compensate the immediate liability they face after the deal. Based on the same topic, Erickson (1998) found a higher average premium is demanded by shareholders if the transaction is taxable, rather than tax-free. Seminal evidence from Carleton et al. (1983) highlights that cash offers are more likely than stock offers when target firms have low dividend payout ratios and expected growth is lower, the latter being measured by the market-to-book ratio.

The academic research on tax issues as determinants of M&A has given more attention to tax considerations at the corporate level. The extant Literature regarding tax attributes that may drive more M&As cites the following causes: tax attributes regarding unused tax credits and tax losses (NOLs) (Auerbach and Reishus, 1987; Cooper and Knittel, 2006); the management of the asset basis before the M&A to allow higher future deductions (Brown and Ryngaert, 1991, Hayn, 1989); the organisational form (Erickson and Wang, 2007), and; adjustments to the capital structure to benefit from the tax deductibility of interest (Auerbach and Reishus, 1986).

Gains from tax attributes trigger the increase in the value of target firms and may be reflected in the premium to be paid by acquirers (Gaughan, 2015). However, a paper by Moore and Pruitt (1987) suggests that higher premiums are not due to tax motivation, and they argue that NOLs are priced in capital markets and are partially reflected in the share price of target firms. Research by Kaplan (1989) finds that tax benefits were included in the premium paid for 76 management buyouts (MBO). The value of tax benefits, mostly from interest deductions, represented a wide and surprising range of the premiums paid to pre-buyout shareholders, at a level of between 21% and 143%. Sherman (1972) pointed out important tax advantages arising from conglomerate mergers, associated with the use of debt and better growth opportunities. The use of debt increases for family firms when facing M&As on the buy side (Quarato, 2017).

2.1. Tax avoidance following M&As

Literature exists regarding tax avoidance activity around the world practiced by multinationals, mainly by US-based firms. US multinational firms are increasingly becoming more tax aggressive and are entering into tax schemes and tax planning to avoid taxes (Klassen and Laplante, 2012). The issue is pressing innovation in the structure of M&A deals.

Over the last years, a pattern of cross-border M&A has arisen, through tax inversion deals. A tax inversion occurs when the parent firm moves its headquarters to a foreign country, in order that the foreign firm becomes the "parent". Clearly, these agreements have emerged for tax purposes (Marples and Gravelle, 2014). By changing headquarters to a low-tax country, the combined tax rate reduces significantly for the target firm on the buy side. Desai and Hines (2002) investigated the determinants of corporate inversions. They concluded that larger and more leveraged firms are more likely to invert. However, there is no accordance in the Literature as to whether leverage increases following M&As. Ghosh and Jain (2000)

found strong empirical evidence of higher financial leverage levels following mergers. Contrary to Desai and Hines (2002) findings, a paper by Graham and Tucker (2006) concluded that firms engaged in tax shelters have lower debt ratios. The reasoning is that interest tax deductibility benefit is much lower than the tax savings generated by tax shelters, which are seen as substitutes for tax purposes. Countries such as the Cayman Islands, Bermuda, Panama, or The British Virgin Islands all have zero corporate income tax rates and are considered pure tax havens for sheltering tax liabilities (Kudrle, 2016). However, other countries in Europe, such as Ireland, the Netherlands, or Liechtenstein, though not considered as being pure tax havens, also have low-than-average corporate income tax rates. Desai et *al.* (2006) studied the reasons for transactions in tax havens and they found that the affiliates were allocated in large tax haven countries, precisely for the purpose of transferring taxable income.

The tax rate-gap between countries yield adverse effects for fiscal policies and has a pivotal role in defining aggressive tax planning through profit shifting strategies. Multinational tax avoidance activities are strictly associated with advantages that different tax jurisdictions countries typically offer (Schwarz, 2009). Multinationals have the advantage to shift income between countries with different tax jurisdictions (Huizinga and Laeven, 2008; Bartelsman and Beetsma, 2003).[2] Multinationals can shift income by increasing (decreasing) export prices to high-tax regions (tax havens). One example regards intangible assets transfer, as these offer a unique opportunity for income shifting strategies (Karkinsky and Riedel, 2012), as intellectual property is difficult to measure and it provides more room to adjust the asset basis. Clausing (2003) found that country's tax rates significantly affect intra-firm trade prices. Clausing (2009) found evidence of a tax rate-gap between US and foreign countries, which is responsible for increasing tax avoidance incentives and revenue lost to the tax authority. Klassen and Laplante (2012) found evidence that firms in the US with lower average foreign tax rates are more aggressive income shifters. They estimated that firms with lower average foreign tax rates shifted more $10 billion per year out of United States between 2005 and 2009, compared with the period from 1988 to 1992.

International competition on taxation is responsible for flows of cross-border M&As. Barrios et al. (2012) conclude that the combination of foreign income taxation and supplementary parent income taxation are independent and may act as a disincentive for the choice of location of the foreign subsidiary. Huizinga et al. (2012) evaluated the impact of additional international taxation on the target firm and found that shareholders from the target firm bear the total additional international taxation resulting from a cross-border transaction.

A paper by Huizinga and Voget (2009) studied the effect of the international tax system on the structure of cross-border M&As and found that international double tax liabilities affect the organisational structure of multinationals after cross-border M&As. A report by EY (2015) estimated

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[2] Income shifting can be carried out by setting intra-firm transfer prices on parent-affiliate operations, by choosing intellectual property location, or by planning the moment when foreign income received is repatriated.

the impact of a reduction in the US statutory corporate tax rate on cross-border M&As. A reduction of 100 bps in statutory tax rates would avoid 1,300 US firms and affiliates being open to OECD foreign acquirers: "...the United States would have shifted from a $179 billion deficit with OECD countries to a $590 billion surplus, a $769 billion shift".

2.2. Research hypotheses

The main purpose of this paper is to search for evidence as to whether the level of corporate tax avoidance increases following M&A operations. Is this evidence more pronounced for cross-border M&As operations? Can M&A deals between firms from the same industry sector provide tax synergies? Do some firms provide better tax conditions for M&As (e.g. lower tax rates, net operating losses)? A concurrent paper by Belz et *al.* (2013) analysed the change in target's ETR before, and after the deal, and found evidence of a 3% reduction following the deal. However, the effect is only analysed for the target firm, thus it is relevant to perform a deeper analysis. In contrast to Belz et al. (2013), this paper focusses on the acquired firm. The first research hypothesis is as follows:

H1: There is a decrease in acquirer's ETR following an M&A deal.

Firms in the same industry may have potential gains arising from M&As, such as reduced competition, economies of scale, or increases in market power. Ciobanu et *al.* (2014) suggest that the likelihood of a takeover being successful is higher when it involves firms in similar industries. Devos et al. (2008) estimated synergy gains arising from M&As. The authors find that tax savings represented 1.64% of the average gain of 10.03% while operating synergies represented the remaining 8.38%. However, Brodzka et *al.* (2017) found evidence that sectoral differences explain variability in ETRs. Such considerations suggest that firms from the same industry ought to yield higher tax savings, which motivates the second research hypothesis:

H2: There is a decrease in acquirer's ETR following an M&A deal if both acquirer and target firms are classified as being in the same industry.

International tax rate differences amongst countries trigger tax avoidance strategies (Schwarz, 2009; Huizinga and Laeven, 2008; Clausing, 2009) and can influence the location of FDI and M&A flows. For instance, Erel et al. (2012) concluded that international tax differences are an increasing function of the attractiveness of FDI. Hence, firms with lower tax rates than those of acquirers can be more desirable targets to engage in tax avoidance strategies, which is the rationale of our third research hypothesis:

H3: There is a decrease in acquirer's ETR following an M&A deal if acquirer's ETR is higher than the target's ETR.

The Literature refers frequently to the impact of potential tax attributes on M&A operations. If a target firm has operating tax losses, in order to reduce the tax liability, these losses can be transferred to the acquirer, or vice-versa (e.g., Auerbach and Reishus, 1987). By offsetting the taxable income of the acquirer firm, this allows the acquirer firm to reduce the effective amount of taxes to be paid to the tax authority. Hence, the fourth hypothesis is the following:

H4: There is a decrease in acquirer's ETR following an M&A deal if target firms report losses in the year before the deal.

Tracking the reasoning of H3, multinational firms can benefit from affiliates being located in low-tax countries to engage in tax avoidance strategies through income shifting. Furthermore, firms from certain industries can be strongly motivated to move their patents to low-tax countries and then charge a fee or royalty to high-tax country affiliates (see Dyreng et al., 2008). The following hypothesis is addressed:

H5: There is a decrease in acquirer's ETR following an M&A when firms are not located in the same country (cross-border deal).

Profitability may influence two opposing tax behaviours (Rice, 1992). More profitable firms have greater ability to understate income without being under the scrutiny of the tax administration. However, less profitable firms may be pressurised to engage in tax avoidance strategies to reach industry standards and analysts' targets, through increases in pre-tax earnings, or decreases in the income tax expense. However, most of the existent studies highlight that the incentive for tax avoidance is increasing in profitability (Dunbar et al., 2010), thus the last research hypothesis is as follows:

H6: Acquirer's ETR following an M&A is lower for more profitable firms.

3. RESEARCH METHODOLOGY

3.1. Data

The initial sample is formed by all completed European M&A deals available from the Thomson Reuters Eikon database, which was announced between 2005 and 2014. The period of study runs from 2005 to cover the accounting harmonisation in Europe and to increase comparability. European M&As are defined in this study as being deals in which both acquirer and target firms are European-based. The initial sample was narrowed down for the following reasons: European special member state territories were excluded, due to restricted disclosure of financial data; deals where one or both firms had no identification code available, as it is essential to collect and match the financial data. All ownership percentages and forms of acquisitions were considered to cover a wide range of M&As. After eliminations, a sample of 1,031 deals was identified, containing information about deal size, percentage acquired, transaction form, firm's country of headquarters, industry, announcement date, form of transaction, and firm status (public vs. private). For the deals identified, we collected data from financial statements for both acquirer and target firms from 2005 to 2014. The reporting country of a firm can be different from the location of its headquarters, and therefore firms with headquarters outside Europe were removed. After collecting all the data, the two databases were merged (list of deals and financial data), in order to associate the acquirer-target deal with its financial data. For the merger process, we only considered one deal of each acquirer and target firm, otherwise, it would not be possible to implement our research

design. A final sample of up to 10 years of financial statement data was obtained for 391 deals, from 23 different business sectors, and 16 European countries - 240 of which are cross-border deals. The final sample comprises 2,167 firm-year observations.

3.2. Measuring corporate tax avoidance

Corporate tax avoidance may be referred to as all tax planning transactions that explicitly reduce the amount of taxes paid by a firm (Dyreng et al., 2008; Hanlon and Heitzman, 2010). Several measures of tax avoidance are used in the literature, although effective tax rates (ETR) are preferred, due to their wider availability and comparability. The contribution of Graham et *al.* (2015) is relevant, as they focus on the viewpoint of practitioners. Using data from a survey, the authors conclude that managers prefer statutory tax rates or effective tax rates for the decision-making process, rather than marginal tax rates and other tax measures. Determinants and consequences of corporate tax avoidance have been extensively studied in the literature, such as firm size (Mills et *al.* 1998; Rego, 2003); effects from economies of scale; political costs (Rego 2003; Sudibyo and Jianfu, 2016), and effects from top executives (Dyreng et al., 2010), to name just a few.

Book ETR (*BETR*) is the main measure of corporate tax avoidance applied in this study, which is defined as being the ratio of income tax payable to

EBT. The measure "reflects the aggregate proportion of the accounting income payable as taxes" (Salihu et al., 2013) as is used in other recent studies, such as that of Zemzem and Ftouhi (2016). The option for an accounting ETR derives from the advantage of these measures to include the effects of both temporary and permanent book-tax differences. An additional measure is included as robustness – Cash ETR (*CETR*), which is equal to cash taxes paid, divided by EBT. Both measures were winsorized at 1 percent to account for outliers. Measures of tax avoidance are frequently normalised for a period of 3, 5, or 10 years, as recommended by Dyreng et al. (2008). The inclusion of multi-year measures of ETRs would not enable us to capture the change in ETRs immediately following the deals, and ultimately this is the reason for normalisation not being included in the econometric approach.

3.3. Econometric approach

To test the impact of M&As on acquirer's ETR following the deal, we created a dummy variable *D*, which is equal to one from the year when the deal occurs onwards. The inclusion of *D* in a difference-in-differences model aims to capture the effect of tax avoidance arising uniquely from the M&A. The base model following a difference-in-differences approach is estimated as:

$$ETR_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 \ln Assets_{it} + \beta_3 CAPEX_{it} + \beta_4 Intangibles_{it} + \beta_5 Inventory_{it} + \beta_6 Accruals_{it} + \beta_7 PPE_{it}$$
$$+ \beta_8 Leverage_{it} + \beta_9 Equity_{it} + \beta_{10} TaxRate_{ct} + \beta_{11} Trust_{ct} + \sum_{i=1}^{23} \varphi_z + \sum_{t=1}^{10} \delta_t + \sum_{c=1}^{16} \gamma_c + \varepsilon_{cizt} \qquad (1)$$

where, φ_z is the fixed-effect specification for industry z; δ_t is the time fixed-effects for year *t*, and γ_c represents country fixed-effects for country *c*.

To control for firms' characteristics, the following variables were used: *lnAssets* is equal to the log of total assets of the firm and is used as a proxy for firm's size; *CAPEX* is given by the ratio of capital expenditures to total assets. *Intangibles* is defined as goodwill divided by total assets; *Inventory* represents inventory intensity measured as the ratio of inventory to total assets, and; *PPE* represents capital intensity, defined as the ratio of property, plant, and equipment (PP&E) to total assets. *Leverage* is long-term debt divided by total assets. *Equity* is equal to equity of the firm divided by total assets. *Accrual* is a measure of earnings management, and is calculated by the ratio of EBT to operating cash flow. The variable aims to control for corporate tax avoidance derived from earnings management. Lastly, we included two controls at country level: *TaxRate* captures the average statutory tax rate in each country, and; *Trust* from the Global Competitiveness Reports of World Economic Forum reflects the trust in government and proxies for the culture of a country. Robinson and Slemrod (2012) studied the determinants of tax system variation among countries using several economic, political, and culture measures. They find that *Trust* is the most reliable determinant of tax systems variability. All standard errors are robust for heteroscedasticity and serial correlation.

Tax synergies may be difficult to materialise when the deal occurs and may only be attained in the medium-run. Therefore, Eq. 1 is decomposed to account for time variations in the treatment effect. D_{First} is the treatment effect exclusively for the year of the deal and $D_{AfterFirst}$ captures the treatment effect onwards:

$$ETR_{it} = \beta_0 + \alpha_1 D_{First_{it}} + \alpha_2 D_{AfterFirst_{it}} + CONTROLS + \mathcal{E}_{cizt} \qquad (2)$$

in which the same controls from Eq. 1 are used for all the equations.

To test the effect of M&A on deals involving firms in the same industry was included in Eq. 3 and also interaction of *D* with $D_{INDUSTRY}$, the latter taking the value one, if both target and acquirer firms belong to the same industry, and zero otherwise:

$$ETR_{it} = \beta_0 + \beta_1 D_{it} + \alpha_1 D_{it} \times D_{INDUSTRY_i} + CONTROLS + \mathcal{E}_{cizt} \qquad (3)$$

In Eq. 4 the analysis proceeds by focusing on target firms with ETRs lower than acquirers. The economic reason for this hypothesis is that firms with lower tax rates might be more desirable targets for acquirers that aim to engage in tax avoidance strategies. $D_{DIF\ ETR}$ is a dummy variable equal to one when the target's *ETR* is lower than acquirer's *ETR* in the year before the deal, and zero otherwise:

$$ETR_{it} = \beta_0 + \beta_1 D_{it} + \alpha_1 D_{it} \times D_{DIFF\ ETR_i} + CONTROLS + \mathcal{E}_{cizt} \qquad (4)$$

The fifth model assesses the potential benefits from target's negative pre-tax income one year before the deal. To reduce the income tax to be paid, tax losses could be transferred from the target to the acquirer, or vice-versa (e.g. Auerbach and Reishus, 1987). To test the fourth research hypothesis, $D_{TARGET\ LOSS}$ interacted with D is included, the former taking the value one when target firms report negative pre-tax income one year before the deal, and zero otherwise:

$$ETR_{it} = \beta_0 + \beta_1 D_{it} + \alpha_1 D_{it} \times D_{TARGET\ LOSS_i} + CONTROLS + \mathcal{E}_{cizt} \qquad (5)$$

To evaluate the potential impact on tax avoidance after an international M&A we included an interaction with $D_{DOMESTIC}$, which is equal to one for domestic deals and zero if it is classified as cross-border:

$$ETR_{it} = \beta_0 + \beta_1 D_{it} + \alpha_1 D_{it} \times D_{DOMESTIC_i} + CONTROLS + \mathcal{E}_{cizt} \qquad (6)$$

Lastly, the analysis focuses on firm's profitability. A measure of profitability is added, *ROE* or *ROA,* which is interacted with the treatment effect D:

$$ETR_{it} = \beta_0 + \beta_1 D_{it} + \alpha_1 D_{it} \times ROE_{it} + \alpha_2 ROE_{it} + CONTROLS + \mathcal{E}_{cizt} \qquad (7)$$

Table 1 Table 1 describes the variables applied in the econometric approach and the expected sign for the respective coefficient.

Table 1. Variables definition

Variable	Description (predicted sign)	Definition
*Tax avoidance measures (ETR***)**		
BETR	Book effective tax rate	Income tax payable divided by earnings before taxes. *BETR* is winsorized at 1%.
CETR	Cash effective tax rate	Cash tax paid divided by earnings before taxes. *CETR* is winsorized at 1%.
Controls		
ln*Assets*	Size of the firm (+)	Natural log of total assets.
CAPEX	Capital expenditures (-)	Capital expenditures scaled by total assets.
Intangibles	Intangibles (?)	Goodwill scaled by total assets.
Inventory	Inventory intensity (+)	Inventory scaled by total assets.
Accruals	Accruals (?)	Difference between earnings before taxes and operating cash flow divided by lagged total assets.
ROE	Return on equity (-)	Net income divided by equity.
ROA	Return on assets (-)	Net income divided by total assets.
PPE	Capital intensity (-)	Property, plant, and equipment (PP&E) scaled by total assets.
Leverage	Leverage (-)	Long-term debt divided by total assets.
Equity	Equity value (-)	The equity value of the firm.
TaxRate	Statutory Tax Rate	Statutory tax rate at country level, from KPMG, available at Available online at https://home.kpmg.com/xx/en/home/services/tax.html
Trust	Trust in politicians (?)	Cultural variable used by Robinson and Slemrod (2012), which measures trust in politicians. The survey question was: "Public trust in the financial honesty of politicians", 1 is very low and 7 is very high.
Treatment effect		
D	Treatment effect (-)	Dummy variable equal to 1 from the year the deal onwards, and 0, otherwise.
D_{First}	Year of the deal	Dummy variable equal to 1 for the year the deal occurs, and 0 otherwise.
$D_{AfterFirst}$	Years after the deal	Dummy variable equal to 1 from the first year after the deal onwards and 0 otherwise.
$D_{INDUSTRY}$	Same industry (-)	Same industry dummy, which is equal to 1 if both acquirer and target belong to the same industry sector, and 0, otherwise.
$D_{DIF\ ETR}$	ETR lower for target (-)	Target's ETR lower than acquirer's ETR. The variable takes the value 1 if each corresponding tax avoidance measure is lower for target firm than for acquirer the year before the deal and 0 otherwise.
$D_{TARGET\ LOSS}$	Target with NOL (-)	Target with NOL, in which the variable is equal to 1 if target's earnings before tax are negative the year before the deal, and 0, otherwise.
$D_{DOMESTIC}$	Domestic M&A (-)	Domestic vs Cross-Border M&A deal. The variable is equal to 1 if the deal is domestic and 0 if it is between firms headquartered in different countries.

3.4. Descriptive statistics

Table 2 summarises descriptive statistics for the variables used in the equations described above, and the coefficients of the pairwise Pearson correlation between these variables is represented in Table 3. Regarding the two tax avoidance measures, acquirer's *BETR* mean is equal to 16.9%, while *CETR* mean is equal to 26.1%, and standard deviations of these two measures are significantly high. The average level of leverage of acquirers points out that roughly 17.4% of total assets are financed by long-term debt. Both ROA and ROE are positively correlated, although not in a strong form, and they

present conventional levels for the mean, which are 6.1% and 15.5%, respectively. Both ROA and ROE are statistically negatively associated with proxies for corporate tax avoidance, which is in contrast to Santosuosso (2017) findings. The author suggests a positive correlation between firm profitability and tax burden.

Table 2. Descriptive statistics by variable

Variable	No.	Mean	Std. Dev	1st Quartile	Median	3rd Quartile
Tax Measures						
BETR	2,167	0.169	0.165	0.063	0.122	0.217
CETR	2,167	0.261	0.160	0.155	0.244	0.333
Profitability Measures						
ROA	2,167	0.061	0.050	0.029	0.051	0.080
ROE	2,167	0.155	0.329	0.080	0.134	0.193
Firm-Level Controls						
lnAssets	2,167	22.36	2.240	20.69	22.27	23.95
CAPEX	2,167	0.051	0.041	0.025	0.039	0.064
Intangibles	2,167	0.156	0.136	0.043	0.123	0.240
Inventories	2,167	0.108	0.096	0.023	0.089	0.167
Accruals	2,167	-0.012	0.094	-0.047	-0.016	0.018
PP&E	2,167	0.227	0.177	0.091	0.189	0.308
Leverage	2,167	0.174	0.129	0.074	0.161	0.250
Equity	2,167	0.411	0.165	0.297	0.401	0.509
Country Level Controls						
TaxRate	2,167	0.274	0.057	0.250	0.280	0.333
Trust	2,167	4.464	1.036	3.666	4.405	5.372

Table 3. Matrix of correlations

Variable		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
BETR	(1)	1											
CETR	(2)	0.19*	1										
ROE	(3)	-0.09*	-0.10*	1									
ROA	(4)	-0.30*	-0.26*	0.27*	1								
lnAssets	(5)	0.04*	0.09*	-0.04	-0.12*	1							
Capex	(6)	-0.07*	-0.02	0.03	0.07*	0.06*	1						
Intangible	(7)	0.08*	0.10*	0.00	-0.09*	0.00	-0.26*	1					
Inventories	(8)	0.01	0.00	0.03	0.04	-0.20*	-0.15*	-0.28*	1				
Accruals	(9)	-0.15*	-0.09*	0.07*	0.41*	-0.05*	-0.22*	-0.07*	0.17*	1			
PPE	(10)	-0.06*	-0.02	-0.03	0.01	0.26*	0.54*	-0.32*	-0.10*	-0.15*	1		
Leverage	(11)	0.02	0.05*	-0.02	-0.25*	0.21*	0.18*	0.11*	-0.20*	-0.12*	0.26*	1	
Equity	(12)	-0.18*	-0.11*	-0.04*	0.43*	-0.20*	-0.06*	0.02	0.00	0.16*	-0.01	-0.48*	1

*Notes: This matrix reports univariate analyses. The symbol * represents significant a level of 5%.*

4. RESULTS

4.1. Tax avoidance following M&As

Table 4 presents the initial results of the first five research hypotheses. The regression analysis is conducted using *BETR* as a proxy for corporate tax avoidance, while *CETR* is only used as robustness. In the first research hypothesis, the impact of M&A on acquirer's level of corporate tax avoidance is studied. In Column (1), of Table 4 we can observe a negative coefficient for the variable *D*. Despite the fact that the negative sign is consistent with H1, the evidence is weak for supporting higher levels of corporate tax avoidance for the acquirer following M&As. Belz et al. (2013) found a decrease on ETR after the deal of 3%, but for the target firm. Results point out that taxes might influence M&As, but it is inconclusive as to whether the overall level of corporate tax avoidance of acquirers is affected by M&A deals.

The timing for obtaining the tax benefits from the deals may shape how M&As affect tax avoidance strategies. In Column (2), the analysis is extended to include two distinct periods following M&As, namely the year in which the deal occurs (D_{First}), and the period onwards ($D_{AfterFirst}$). The coefficient for $D_{AfterFirst}$ suggests that decreases in acquirer's ETR are more pronounced during the years following the deal, although the evidence is not significantly robust,

using additional controls in the robustness section. Nevertheless, this result may be driven by the

inability of acquirers to achieve the desired tax savings in the year when the deal occurs.

Table 4. Effect of M&A deal on corporate tax avoidance

OLS estimation	(1)	(2)	(3)	(4)	(5)	(6)	(7)
D	-0.017 (0.010)		-0.015 (0.012)	-0.016 (0.011)	-0.016 (0.011)	0.001 (0.012)	0.002 (0.012)
D_{First}		-0.012 (0.012)					
$D_{AfterFirst}$		-0.020* (0.012)					
$D \times D_{INDUSTRY}$			-0.003 (0.009)				
$D \times D_{DIF ETR}$				-0.035 (0.025)			
$D \times D_{TARGET LOSS}$					-0.067** (0.027)		-0.121*** (0.027)
$D \times D_{DOMESTIC}$						-0.026*** (0.009)	-0.027*** (0.009)
$D \times D_{DOMESTIC} \times D_{TARGET LOSS}$							0.069* (0.040)
ln$Assets$	0.003 (0.002)	0.004 (0.002)	0.003 (0.002)	0.003 (0.002)	0.003 (0.002)	0.002 (0.002)	0.002 (0.002)
ROE	-0.063** (0.032)	-0.063** (0.032)	-0.063** (0.032)	-0.063** (0.032)	-0.063** (0.032)	-0.063** (0.031)	-0.063** (0.031)
$CAPEX$	-0.290*** (0.092)	-0.289*** (0.092)	-0.289*** (0.092)	-0.284*** (0.092)	-0.290*** (0.092)	-0.313*** (0.092)	-0.311*** (0.092)
$Intangibles$	0.091*** (0.030)	0.091*** (0.030)	0.092*** (0.030)	0.091*** (0.030)	0.091*** (0.030)	0.084*** (0.030)	0.084*** (0.030)
$Inventories$	0.087* (0.045)	0.088** (0.045)	0.086* (0.045)	0.086* (0.045)	0.087* (0.045)	0.081* (0.045)	0.081* (0.045)
$Accruals$	-0.221*** (0.062)	-0.221*** (0.062)	-0.220*** (0.062)	-0.220*** (0.062)	-0.222*** (0.063)	-0.220*** (0.062)	-0.221*** (0.062)
$PP\&E$	0.013 (0.028)	0.013 (0.028)	0.013 (0.028)	0.012 (0.028)	0.011 (0.028)	0.003 (0.028)	0.000 (0.028)
$Leverage$	-0.083** (0.035)	-0.082** (0.035)	-0.083** (0.035)	-0.081** (0.035)	-0.082** (0.035)	-0.083** (0.035)	-0.082** (0.036)
$Equity$	-0.207*** (0.032)	-0.207*** (0.032)	-0.208*** (0.032)	-0.207*** (0.032)	-0.206*** (0.032)	-0.205*** (0.031)	-0.204*** (0.031)
$TaxRate$	0.105 (0.223)	0.103 (0.222)	0.105 (0.223)	0.106 (0.223)	0.116 (0.223)	0.118 (0.222)	0.127 (0.223)
$Trust$	-0.002 (0.010)	-0.002 (0.010)	-0.002 (0.010)	-0.002 (0.010)	-0.002 (0.010)	-0.002 (0.010)	-0.002 (0.010)
$Constant$	0.122 (0.111)	0.110 (0.113)	0.122 (0.111)	0.124 (0.111)	0.121 (0.110)	0.144 (0.110)	0.144 (0.110)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,167	2,167	2,167	2,167	2,167	2,167	2,167
Adjusted R^2	0.135	0.135	0.135	0.135	0.136	0.139	0.139

Notes: $ETR_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 \ln Assets_{it} + \beta_3 ROE_{it} + \beta_4 CAPEX_{it} + \beta_5 Intangibles_{it} + \beta_6 Inventory_{it} + \beta_7 Accruals_{it} + \beta_8 PPE_{it} + \beta_9 Leverage_{it} + \beta_{10} Equity_{it} + \beta_{11} TaxRate_{ct} + \beta_{12} Trust_{ct} + \sum_{i=1}^{23} \varphi_z + \sum_{t=1}^{10} \delta_t + \sum_{c=1}^{16} \gamma_c + \varepsilon_{cizt}$
In all columns, the dependent variable is BETR, which is equal to Income Tax payable divided by earnings before taxes and is winsorized at 1%. Fixed effects for year, country and industry were included in all equations. Robust standard errors were used in all equations, with t statistics in parentheses, and the *, ** and *** symbols representing the significance levels of 10%, 5%, and 1%, respectively.

The variable *lnAssets* is statistically positive and indicates that larger firms support higher tax burdens (e.g. Rego, 2003; Zimmerman, 1983). For *CAPEX*, there is statistical evidence of a negative relationship with ETR, which is in contrast with the findings of Dyreng et *al.* (2010). Acquirers with higher levels of capital expenditures seem to have lower book ETRs. *Intangibles* are uncertain by nature, and managers have a significant discretion in its carrying amount. The empirical evidence is very significant to support a positive relationship with ETR. Results suggest that acquirer firms with higher amounts of goodwill recognised in their financial statements face higher tax burdens. Results add to the extant literature about the goodwill of the valuation of these intangibles for the purchase

premiums in business combinations, especially in the case of foreign acquisitions (Abeysekera, 2012; Norbäck et al., 2009). For *Inventories*, the relationship with ETR is statistically positive, being consistent with Gupta and Newberry (1997), although contrary to Mills et *al.* (1998), who did not find a consistent relationship between inventory intensity and tax expenditures.

4.2. M&As in the same industry

The second research hypothesis is tested in column (3) of Table 4 by adding an interaction variable to D and $D_{INDUSTRY}$. The aim is to focus on the effects of M&A on ETRs derived from deals involving firms in the same industry. The statistical evidence

does not support a negative effect of M&As on acquirer's ETR for deals in the same industry. Our results are in contrast with existent empirical evidence. A paper by Fee and Thomas (2004) using a sample of horizontal mergers finds evidence of stronger operating performance during the year after the merger. Likewise, Healy et al. (1992) found evidence of higher operating cash-flow after a merger using a sample of US firms.

4.3. Target firm with lower ETR

Column (4) of Table 4 tests *H3*, which aims to understand whether acquirer's ETR decreases if the target's ETR is lower during the year before the deal. There is no evidence of lower levels of corporate tax avoidance following M&As when acquirer's ETR is higher than target's ETR. Small differences between ETRs for both target and acquirer firms before the deal might justify these results. To better understand this ambiguous result, an additional analysis was performed by computing the mean of book ETR for both acquirer and target. The mean difference among firms varies between 1% and 2%, in absolute terms, which is somehow consistent with results in Table 4.

4.4. Target firm reporting losses

The next research hypothesis, tested in Column (5) of Table 4 assesses whether acquirer's ETR decreases if the target firm reports losses during the period pre-deal, and was found to provide statistical support for H4. The negative coefficient for $D \times D_{TARGET\ LOSS}$ suggests a decrease in ETR of about 6.7% for the acquirer firm following M&As, given that the target firm reported negative pre-tax earnings. The rationale is that target's NOL carryforwards can be seen as being an economic asset for the target firm, as they can reduce the amount of taxes paid in the future (Bottomlee et al., 2009). Our results are consistent with Hayn (1989) conclusions that tax attributes could be an important driver for acquisitions, and with Auerbach and Reishus (1986; 1987; 1988), who found evidence of potential gains in merger activity arising from the transference of tax attributes from one firm (target) to offset the gains of the other (acquirer).

4.5. Domestic vs cross-border M&As

In Column (6) of Table 4 *H5* is assessed – whether acquirer's tax burden is lower when the deal is cross-border, in contrast with domestic ones. The results support a negative association between *ETR* and $D \times D_{DOMESTIC}$, meaning that acquirer's *ETR* decreases after the deal if the deal is between firms whose headquarters are in the same country. Existent empirical evidence seems to favour the theory that firms from high-tax jurisdictions enter into M&As with firms from low-tax countries, in order to reduce the amount of taxes that have to be paid through strategies of income shifting (Klassen

and Laplante, 2012; Clausing, 2003). A paper by Erel et al. (2012) found that taxes influence cross-border mergers decision if the acquirer firm is usually located in a higher-tax jurisdiction than that of the target firm. Conversely, it is important to note that in this research, only European M&As were included, while the studies mentioned above covered M&As from all over the world. Overall, results in this paper are in contrast with most of the existent literature and they suggest that acquirers in domestic M&As decrease ETR by about 2.6% following a deal.

ETRs are more likely to decrease following M&As for domestic deals and if the target company reports losses during the year before the deal. The next analysis focusses on whether these elements are mutually exclusive. Empirical evidence has not documented this. However, the potential gain for acquirers in horizontal M&A is when the target firm reports losses and, therefore, there is potential for NOLs. The effect on acquirer's ETR following M&As is increased when the deal is domestic, and the acquirer targets firm reporting losses, and in these situations, the decrease in ETR is of about 7.9%.

4.6. The role of profitability

In the research hypothesis section, it was stated that acquirer's profitability following M&A deals increases the level of corporate tax avoidance. The analysis of *H6* is tested in Table 5. In Columns (1) and (2) profitability is measured by return on equity (ROE), while in the remaining columns, a measure of return on assets (ROA) stands for profitability.

Results in Columns (1) and (3) suggest that profitability is a driver of firm's ETR, with a negative sign. The logic seems to be that profitable firms have more ability to manage the level of corporate tax avoidance while avoiding being under the scrutiny of the tax administration (Rice, 1992). Our findings are also consistent with the view that the incentive for tax avoidance is increasing profitability (Dunbar et *al.*, 2010), which is consistent with Mills et al. (1998) research, which found that more profitable firms engage in more tax planning activities.

In Columns (2) and (4), the paper attempts to understand the effect of profitability on firm's ETR derived from an M&A deal. In both columns, the measures of profitability, either ROE or ROE, are statistically negative, although the effect is more pronounced when interacted with the treatment effect (*D*). That is to say, more profitable firms are able to decrease ETR, although this decrease is more pronounced if the firm takes part in the buy-side of M&As. The inclusion of several combinations of control variables does not change the robustness of results in Table 5. These results are not reported here for parsimony. Therefore, we can confirm *H6* that acquirer's ETR is lower for profitable firms following M&A deals. In our estimations, a 100 basis point increase in ROE (ROA) triggers a decrease in acquirer's ETR after the deal of about 0.25% (1.0%).

Table 5. Effect of M&A deal on corporate tax avoidance – profitability

OLS estimation	(1)	(2)	(3)	(4)
D	-0.017 (0.010)	0.019 (0.017)	-0.016 (0.010)	0.022 (0.019)
ROE	-0.063** (0.032)	-0.032*** (0.010)		
D × ROE		-0.217*** (0.076)		
ROA			-0.852*** (0.096)	-0.481*** (0.139)
D × ROA				-0.552*** (0.161)
lnAssets	0.003 (0.002)	0.004 (0.002)	0.003 (0.002)	0.003 (0.002)
CAPEX	-0.290*** (0.092)	-0.221** (0.097)	-0.159* (0.090)	-0.165* (0.089)
Intangibles	0.091*** (0.030)	0.093*** (0.030)	0.076** (0.030)	0.081*** (0.029)
Inventories	0.087* (0.045)	0.099** (0.044)	0.076* (0.045)	0.087** (0.044)
Accruals	-0.221*** (0.062)	-0.179*** (0.060)	-0.058 (0.058)	-0.076 (0.048)
PP&E	0.013 (0.028)	0.008 (0.029)	0.003 (0.028)	-0.001 (0.028)
Leverage	-0.083** (0.035)	-0.090** (0.035)	-0.095*** (0.035)	-0.102*** (0.035)
Equity	-0.207*** (0.032)	-0.215*** (0.034)	-0.114*** (0.031)	-0.107*** (0.031)
TaxRate	0.105 (0.223)	0.075 (0.219)	0.026 (0.221)	0.024 (0.220)
Trust	-0.002 (0.010)	-0.002 (0.010)	-0.005 (0.010)	-0.004 (0.010)
Constant	0.122 (0.111)	0.103 (0.109)	0.144 (0.109)	0.105 (0.109)
Time FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	2,167	2,167	2,167	2,167
Adjusted R^2	0.135	0.152	0.165	0.170

Notes: $ETR_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 \ln Assets_{it} + \beta_3 ROE_{it} + \beta_4 CAPEX_{it} + \beta_5 Intangibles_{it} + \beta_6 Inventory_{it} + \beta_7 Accruals_{it} + \beta_8 PPE_{it} + \beta_9 Leverage_{it} + \beta_{10} Equity_{it} + \beta_{11} TaxRate_{ct} + \beta_{12} Trust_{ct} + \sum_{i=1}^{23} \varphi_z + \sum_{t=1}^{10} \delta_t + \sum_{c=1}^{16} \gamma_c + \varepsilon_{cizt}$

*In all columns, the dependent variable is BETR, which equal to Income Tax payable divided by earnings before taxes and is winsorized at 1%. Fixed effects for year, country and industry were included in all equations. Robust standard errors were used in all equations, with t statistics in parentheses, and the *, ** and *** symbols representing the significance levels of 10%, 5%, and 1%, respectively.*

4.7. Robustness checks

To access the robustness of results, several sensitivity analyses were performed. Four country-level variables could be relevant to explain M&A activity and its relationship with tax avoidance. The literature refers frequently to the relationship between horizontal mergers and anti-trust policy. Several large firms enter into anti-competitive horizontal mergers to eliminate competition and increase market power (Lee, 2013). These operations, which are mostly carried out by monopolistic and oligopolistic firms, can seriously affect the efficiency of the market. Nevertheless, antitrust laws play a relevant role by maintaining the basic rules of competition and avoiding monopolistic practices. Therefore, a measure of the effectiveness of anti-monopoly policy (*Anti-trust*) for each country was added. A proxy for the macroeconomic environment of a country (*Macroeconomic*) was also introduced. Erel et al. (2012) found that macroeconomic performance could make cross-border M&As more attractive for acquiring firms. Choi and Jeon (2011) also found a long-run equilibrium relationship between some macroeconomic variables and merger activity. The variable *Macroeconomic* is a

composition of several indicators of the country[3]. The quality and strength of accounting standards affect the volume of M&A activity. This is fundamental and is good disclosure for the identification of potential targets (Rossi and Volpin, 2004)[4]. Bris and Cabolis (2008) built some measures of change in investor protection. The authors found a positive relationship between the quality of shareholders' protection and accounting standards in the acquirer's country and the merger premium paid in cross-border deals, relative to domestic deals. The *Accounting* variable was added as a measure of the strength of auditing and accounting standards. Finally, we introduced the variable *R&D*, which reflects the level of R&D spending by firms in a country, relative to their international peers. Bertrand and Zuniga (2006) found that international M&A operations can stimulate R&D expansion. Furthermore, several countries possess tax incentive policies for firms to increase their R&D expenditure[5]. The inclusion of more controls at a country level does not change the initial conclusions. Analysing

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[3] This variable includes government budget balance, gross national savings, inflation, government debt, and country credit ranking, all taken from Global Competitiveness Report.
[4] The authors used an index of the quality of accounting standards as a proxy for investor protection, developed by La Porta et al. (1998).
[5] The European Commission set out investment in R&D as one of their five priorities to increase Europe´s competitiveness (see Straathof et al., 2014).

the effect of the new variables on tax avoidance measures, *Anti-trust* appears to be negatively related with *ETR*, which indicates that the higher the level of effectiveness of anti-monopoly policy in acquirer's country, the lower the amount of taxes paid by the acquired firm. For *R&D*, there is statistical evidence of a positive relationship with *ETR*, indicating that the higher the level of R&D spending in acquirer's country, the lower the level of conforming tax avoidance.

There is no consensus in the literature regarding the best proxy to measure corporate tax avoidance. Taking this concern into consideration, all models are re-estimated using a Cash measure for ETR, rather than the Book ETR. Not all the conclusions for the first five research hypothesis are supported by this different specification, although *H6* remains robust with the inclusion of *CETR*. The exclusion of the fixed effect specification for industries was made to relax the assumption of delimited variability in ETR by industry, which yielded consistent results.

5. CONCLUSIONS

This paper investigates the change in the level of corporate tax avoidance following M&As. Six research hypotheses were tested on a sample of 391 European deals, involving 16 European countries, for a period of 10 years, between 2005 and 2014. No significant evidence of increasing tax avoidance of acquirer firms following M&As was found. Our main finding is contrary to that of Belz et al. (2013), who found a decrease in ETR of 3% following M&A deals, although they focused on the target firm, rather than on the acquirer. Nevertheless, this result should be discussed considering several features of the M&A deals.

6. DISCUSSION

The timing of the M&A was analysed, but there is not robust enough result to support a higher decrease in acquirers ETR after the year of the deal. Neither was any evidence of increasing tax avoidance following M&A found when target's ETR is lower than that of the acquirer during the year before the deal. The small average difference in ETRs between acquirer and target firms in the sample might explain the inconclusive result. Further analysis of this relationship is recommended, perhaps to only include deals for which the tax rate difference between both firms is more relevant.

Acquirer's ETR falls by about 6.7% following M&As for deals when the target firm reports negative pre-tax income during the year before the deal. The tax savings for the acquirer should encourage the tax administrations to increase enforcement during M&A transactions to prevent firms from taking advantage of the European neutrality regime for mergers, which allows firms to carry forward tax losses under certain conditions. This result is consistent with Hayn (1989), regarding the potential transfer of tax attributes from the acquirer to the target, and vice-versa, to reduce the

amount of taxes to pay for the tax administration. Auerbach and Reishus (1986, 1987, 1988) insights that tax savings due to the carrying forward of tax losses may be driving several M&A transactions fits with the findings of this paper.

A decrease in acquirer's ETR of about 2.6% was also found in domestic M&A transactions, comparing to cross-border ones. Previous literature suggests the opposite, whereby cross-border transactions are more likely to yield tax savings (Belz et al., 2013; Huizinga and Voget, 2009). The sample is limited to cross-border deals within Europe, and tax savings in cross-border deals might only be relevant for transactions between firms that are not subject to taxation guidelines, and where tax inversion deals are more likely – beyond a European scope. Furthermore, for domestic deals when the target company reports losses, the decrease in ETRs is even larger, at around 7.9%.

Finally, the focus on profitability yielded interesting conclusions. On one hand, the existent literature considered profitability to be a determinant of tax avoidance (e.g., Dunbar et al., 2010) and such an understanding was confirmed in this paper. On the other hand, we found that more profitable acquirer firms might decrease ETR even further when they engage in M&As, which may indicate that profitable firms have more ability to manage the level of corporate tax avoidance while avoiding being under the radar of the tax administration (Rice,1992). Estimations point to a decrease in acquirer's ETR of about 0.25% (1.0%) when acquirer firms are able to increase ROE (ROA) by 100 basis points following the deal.

Our findings add a small, but a relevant contribution to the literature on corporate tax avoidance and M&As. Firstly, this research provides empirical research of corporate tax avoidance in the context of M&As in Europe, which, up until now, has been little discussed in the literature on M&As. Secondly, several findings regarding some features of M&A operations, such as operating losses, were also introduced in the context of tax avoidance and different effects were found from that which was documented by previous empirical evidence. The main policy implication of this study is at a European level, derived from the fact that cross-border M&As within Europe have no effect on acquirer's ETR, which may be due to regulations already in place.

Despite our findings, more research in this field is still required. The inclusion of countries other than the US and Europe could provide a different understanding in this field. Taking advantage of the growing tax inversion activity, especially between US and European firms, a deeper analysis of these operations is relevant for further research. Additional research should focus on whether tax administrations challenge these deals. That is to say, tax administrations may impose restrictions to deals considering features of tax codes, and tax benefits following M&A deals may well be obtained in countries in which tax enforcement is less harsh.

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