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M&A and the Tax Benefits of Debt Financing*

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Abstract:

The deductibility of interest expenses from the corporate tax base creates an incentive for acquiring companies to finance a takeover with debt. I investigate the impact of profit taxation on the financing decision in corporate acquisitions for the first time over a sample of different acquirer countries mainly in Europe. I find that the likelihood to observe a debt financed acquisition increases in the acquirer's tax rate. In addition, I take into account that the financing decisions of particular acquisitions might not be independent from other investment decisions. Therefore, I analyze the acquirer's capital structure development around the acquisition. I find that an increase of the statutory tax rate by one %-point is associated with a stronger increase of the debt ratio by 0.55 %-points during the acquisition period.

Keywords: M&A, Business Taxation, Capital Structure, Empirical Analysis

JEL-Classification: G34, H25, H32

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1 Introduction

In September 2012, France published plans to increase taxes on investment income and to restrict the deductibility of interest expenses from the corporate tax base. This announcement led to a massive complaining by fund managers. They stated this would mean the death of private equity in France.³ One reason for this reaction is that especially acquisitions undertaken by private equity companies are often mainly debt financed. This results in a very large amount of interest expenses according to the large dealvalues of acquisitions of whole companies.

In my sample, there are indeed many acquirers showing a strong increase in the interest expenses after the deal. For example, the interest expenses of Linde AG raised from 145 million to 271 million EUR after the mainly debt financed acquisition of BOC Group in 2006 because of the large dealvalue amounting 12.2 billion EUR. Another example is the acquisition of Cumerio sa/nv by Norddeutsche Affinerie AG in 2008 valued at 543.7 million EUR. The net interest expenses increased from 1.4 million EUR before the deal to 20.3 million EUR after the deal.⁴

As a consequence, a restriction of the deductibility of such expenses may significantly increase the tax burden of acquiring companies. The question is why the fraction of debt financing is so high in some corporate acquisitions. Is it mainly because in large deals it is not possible to issue enough equity for the financing or is there a tax effect? Since tax deductibility creates an interest tax shield, there might be an incentive to use debt as a financing method from a tax point of view. This debt bias is already known and investigated in the empirical literature⁵ and overindebtedness has received increased attention during the recent financial crisis⁶. Mergers and acquisitions are a special case of on average large investments and have experienced increasing importance with respect to foreign direct investment in the last decades.⁷ Therefore, I analyze to what extent the financing decision in corporate acquisitions and the capital structure of acquiring companies are influenced by profit taxation.

I contribute to the literature by analyzing the tax effects on the financing decision in corporate acquisitions in a sample of several, mainly European acquirer countries. In addition, I combine an analysis of the specific deal financing decisions and of the overall

³Compare Chassany (2012).

⁴Compare Linde (2006) and Norddeutsche Affinerie (2009) for these figures.

⁵Compare the metastudy by Feld et al. (2013), for example.

⁶Compare Liu and Rosenberg (2013)

⁷Compare Desai and Hines (2003).

capital structure development of the acquiring companies in the acquisition period. My main finding is that higher tax rates indeed increase the debt to assets ratios of the acquirers in the acquisition period. Looking at deals between 2001 and 2011 with an acquirer in one of 21 European countries, I find that a one %-point raising statutory tax rate is associated with an increase of the debt ratio by 0.55 %-points. Furthermore, the probability to observe an at least partly debt financed deal increases on average by 1.58 %-points for all acquirers and by 2.03 %-points for the subsample of profitable acquirers if the tax rate increases by one %-point.

The remainder of this paper is organized as follows. The next section summarizes the recent empirical literature, section 3 develops the main hypotheses and section 4 describes the data. Section 5 illustrates the empirical approach, section 6 presents the results and finally section 7 concludes.

2 Literature Review

In the empirical literature there exist many studies analyzing the effects of taxes on the capital structure of companies. Most of them find a positive relationship between the tax rate and the debt to assets ratio. Those studies vary in the type of proxy for the marginal tax advantage of debt, the empirical methods used and the types of firms they are investigating. While some studies only looked at one country (for example Graham et al (1998) and Graham (1999) which use simulated marginal tax rates of US corporations), other authors examined tax effects across several countries (e.g. Rajan and Zingales (1995)). While some studies focus on domestic firms (e.g. Altshuler and Grubert (2003)), others analyze the financing decisions of multinational companies (e.g. Overesch and Voeller (2010) and Huizinga et al. (2008)). Overviews can be found in Auerbach(2002), Graham(2003) and a meta-study by Feld et al. (2013).

As Desai and Hines (2003) point out, the share of mergers and acquisitions in foreign direct investment (FDI) has increased significantly in the last decades and in the meantime has become the largest part of FDI underlining the economic importance of such kind of investment. Concerning the financing decision of corporate acquisitions there are already several papers dealing with non-tax determinants of the method of payment. Those studies like Amihud et al. (1990), Martin (1996) and Gosh and Ruland (1998) examine the role of growth opportunities, managerial ownership or cash availability of the acquirer. Analyzing deals within Europe, Faccio and Masulis (2005) also investigate the countervailing effects of corporate control of managers and existing shareholders that will decrease by stock

financing and the financing constraints linked to debt. Using mergers of publicly listed US firms, Ismail and Krause (2010) find a significant impact of the correlation of acquirer and target pre-deal returns, weather the merger is hostile and of defense mechanisms for the acquirer on the method of payment. Bi and Gregory (2011) focus on the overvaluation of acquirers. Madura and Ngo (2012) analyze acquisitions of private firms and find an information asymmetry effect.

The first study investigating the tax advantage of debt financing in corporate acquisitions is Erickson (1998). The author distinguishes between 100 % debt financed cash deals and 100 % equity financed stock deals in the US and finds that higher tax rates increase the probability to observe a debt financed deal. He uses a trichotomous tax variable capturing if the acquirer is near tax exhaustion. As an alternative measure, he uses an indicator variable for a net operating loss.

Dhaliwal et al. (2005) also analyze US deals but take into account the possibility to finance a corporate acquisition by retained earnings. That is why the authors only look at cash deals. The main finding in this study ist that the rules concerning the foreign tax credit limitations in the US significantly influence the decision to use debt or internal funds for the financing of a cash deal. Gosh et al. (2011) do not find robust effects of taxes on the debt issuance of US acquirers in the years after an acquisition using a panel approach.

In contrast to former studies, I examine deals in many countries mainly in Europe. Furthermore, I analyze both public and private firms and the acquisitions labeled as equity financed in my sample can be both cash deals and share deals. Besides the investigation of the probability to observe a debt financed deal I also evaluate the development of the acquirers' debt ratios during the deal period. I find empirical evidence for a higher probability of debt financing if the acquirer faces a high tax rate and for the impact of tax rates on the capital strucure around the deal. Moreover, I investigate the specific tax incentives for multinational companies.

3 Development of Hypotheses

Graham (2003) summarizes the main findings of Modigliani and Miller (1958) and (1963) and Miller (1977): If an investment is purely equity financed, the net earnings will be taxed with the corporate income tax rate τ^C at the company level and in addition dividends will be taxed at the shareholder level with the personal income tax rate τ^P . If the investment

is instead debt financed, the interest payments to the capital provider are not taxed at the company level because they are deductibly from the corporate tax base. However, such payments are taxed at the level of the capital provider with the interest tax rate τ^I . Therefore, the difference in the tax burden between equity and debt financing of an investment with net earnings equal to the interest expenses is

$$\Delta TAX := \{[\tau^C + (1 - \tau^C)\tau^P] - \tau^I\} rD, \quad (1)$$

where r is the interest rate, D is the amount of debt and rD is the amount of interest payments, accordingly. For simplicity, we now assume that τ^P and τ^I equal zero. In reality personal taxes might be irrelevant for the financing decision if the company is very large and has diversified shareholders in different countries and different tax brackets. Then the management does not know and cannot take into account the taxation of individual shareholders and just consider corporate taxation.⁸ In that case equation (1) reduces to

$$\Delta TAX = \tau_{acq}^C rD. \quad (2)$$

In this equation we see immediately that the theoretical tax advantage of debt increases in the statutory corporate income tax rate. Of course there are also negative aspects of debt financing. Several studies modeled these disadvantages explaining why we do not observe 100% debt financed companies, for example financial distress costs or the restricted access to the capital market due to excess demand or insufficient collaterals.⁹ But even if we control for these issues, the tax rate is supposed to influence the financing decision of corporations.

This theory can be adopted for corporate acquisitions. An acquisition brings benefits by yielding synergies. In contrast, the acquirer has to bear the costs. If the deal is equity financed, the cash cannot be used for dividend distribution or the acquirer has to pay with own shares which reduces the influence in the own company. If the deal is financed by debt, the interest expenses lower the distributable profits in the future and reduce the financial room to maneuver. The acquirer tries to minimize the costs of the acquisition. Debt financing can be part of that strategy if the deductibility of interest expenses helps saving taxes. Thus, *ceteris paribus* a higher tax rate should positively influence the probability to use debt for the deal financing as the tax savings increase in the tax rate. Using variation of statutory tax rates over countries and over time I state the first hypothesis:

⁸In my analysis, I focus on the company taxation for the same reasons and employ personal taxation only in sensitivity analyses.

⁹Compare Graham (2003) for an overview.

H 1. *Acquirer companies in high tax countries have a higher probability to use debt to finance a corporate acquisition than companies in low tax countries.*

In addition to the specific decision how to finance the acquisition, I analyze the capital structure change of the acquiring company during the deal period. By considering the development of the debt to assets ratio of the acquirer I take into account that the decision about the financing of the acquisition might not be independent from other investments undertaken in the same period. Furthermore, looking at the change of the debt ratio also gives information about how much debt is used in the acquisition period whereas in the analysis of the probability to observe a debt financed deal I do not know the fraction of debt financing. Concerning the capital structure, I state the following hypothesis:

H 2. *The debt to assets ratio of acquirers in high tax countries should increase during the acquisition period compared to acquiring companies in low tax countries.*

An acquisition is an additional investment, hence the marginal tax rate is relevant for the financing decision. If additional interest expenses do not further reduce the tax base, there is no incentive for debt financing from a tax point of view. This situation is named "tax exhaustion" in the Literatur.¹⁰ The proposed tax effect should thus especially be observed for companies having taxable profits that can be reduced by additional interest expenses. In contrast, loss making acquirers have no incentive to save taxes. Therefore I state the third hypothesis:

H 3. *The effect of taxes on the probability to observe a debt financed deal and the effect on the debt ratio depends on the profit or loss situation of the acquiring company.*

The hypotheses derived above are valid for both, purely domestic and multinational companies. Moreover, for multinationals there are additional tax aspects of corporate acquisitions. Facing different tax systems and rates in the countries their subsidiaries are located in, the opportunities for tax planning are various. Multinationals are found to have incentives for higher internal and overall debt ratios compared to national firms especially if they are majority-owned¹¹ and to use tax rate differences for profit shifting¹².

Ruf (2010) summarizes the tax structuring options in international acquisitions. Generally, multinationals can decide to acquire a given target company through an acquisition vehicle in the target country or by a subsidiary in a different country. In the first case, the

¹⁰ Compare MacKie-Mason (1990), for example.

¹¹ Compare Schindler and Schjelderup (2010).

¹² Compare Møen et al and Huizinga et al. (2008).

profits of the target company can be offset by interest expenses for a debt financed acquisition if the target country applies a group taxation regime that allows for tax consolidation of different entities belonging to the same group. In addition, the acquiring company can use potential past losses of the target company in order to reduce its taxable profits if tax consolidation is possible. This might reduce the incentive to use debt for the deal financing as the loss carry-forward of the target is a non-debt tax shield and decreases the need to further reduce the taxable income of the acquirer by additional interest expenses.

Furthermore, a multinational can use tax rate differences within the group to reduce the acquisition costs. If a subsidiary in a high tax country takes out a loan for the acquisition of a target company in a low tax country, the costs for the acquisition, which are the interest expenses, are deductible from the tax base in a high tax country and the earnings from the acquisition, which are the increased profits of the target company due to synergies, are taxable in a low tax country. In addition, a subsidiary in a low tax country can provide a loan to the acquisition vehicle in the high tax country. Then, there is an additional tax saving because interest expenses are deducted in the high tax country (acquiring subsidiary) but interest earnings are taxable in a low tax country (loan providing subsidiary). This leads to the next hypothesis:

H 4. *The financing decision of multinational companies in the acquisition period is influenced by a possible group taxation and different tax rates within the multinational group.*

4 Data and Descriptive Statistics

I use firm-level data from ZEPHYR and AMADEUS, two databases of Bureau van Dijk. ZEPHYR provides information about mergers and acquisitions in several countries around the world and the involved parties since 1996. I use all mergers and acquisitions through which the acquirer company gets a majority stakeholding in the target company and which was completed between 1998 and 2011. For the analysis I keep all observations where the acquirer and target companies are corporations and where the industry is not public administration, financial industry, activities of households as employers or activities of extraterritorial organisations. AMADEUS is a firm-level database providing unconsolidated accounting data of European companies. In my final sample I drop observations with implausible values for the financial variables such as profit, size, EBIT, market cap-

italization, equity, depreciation, financial result and debt ratio.¹³

4.1 Dependent variables

For the analysis of the probability to observe a debt financed deal the dependent variable is an indicator that equals one if the deal is debt financed and zero if not. The information is collected from three variables in the ZEPHYR database. From the variable DEAL FINANCING I use entries such as *vendor placing*, *leveraged buy out* and *new bank facilities*. *Vendor placing* means that the seller of the target company becomes a shareholder of the acquiring company after the deal and is an indicator for equity financing. The other two entries are indicators for debt financing. A second variable, METHOD OF PAYMENT, contains entries such as *shares* which indicates equity financing and *loan notes* and *debt assumed* which indicate debt financing. In addition, this variable reports if the acquisition price is at least partly paid with *cash*. In a third variable, DEAL SUBTYPE, that mainly describes the kind of the deal I also sometimes find the entry *leveraged buy out*. With this information I construct in a first step an indicator for an at least partly debt financed deal, $Debt_{i,j}$, which equals one if I find one or more of the entries *leveraged buy out*, *new bank facilities*, *loan notes* or *debt assumed* and zero if none of these information is given but at least one of the ZEPHYR variables provide some information about the deal financing or method of payment. In my base sample 18.8 % of deals are labeled as debt financed according to this definition.

Erickson (1998) distinguishes between 100 % debt financed and 100 % equity financed deals. That is why I define in a second step $DebtB_{i,j}$. With this variable I also try to separate debt financed cash deals and equity financed stock deals. $DebtB_{i,j}$ equals one in the same cases like $Debt_{i,j}$ but only if the deal is no *vendor placing* and the method of payment is not *shares*. It only equals zero if *vendor placing*, *shares*, or *cash* and no note about debt financing is given. For some acquisitions I only have the information that cash was used as a method of payment. Those observations cannot be classified into debt or equity financed deals certainly. Therefore, I employ $DebtC_{i,j}$, which excludes these deals. This leads to an increase of the fraction of debt financed deals to 43.8 %.

In contrast to Erickson (1998), Dhaliwal et al. (2005) only look at cash deals. Therefore,

¹³Deals where the acquirer shows pre- or post deal profits > thousand EUR 1.0e+07 or < thousand EUR -1.0e+07, total assets < 0 or >= thousand EUR 1.0e+09, ebit < thousand EUR -1.0e+07 or >= thousand EUR 1.0e+09, market capitalization < 0 or >= thousand EUR 1.0e+10, shareholder funds < 0 or >= thousand EUR 1.0e+09, $D\&A_i < 0$ or $>= 1$, net interest result to assets ratio < 0 or > 1 or debt to assets ratio < 0 are excluded from the analysis.

I also try to identify the method of financing for cash deals. For this reason I redefine $Debt_{i,j}$ and $DebtB_{i,j}$ and only used deals where the variable METHOD OF PAYMENT contains *cash*. Surprisingly, the fraction of debt financed deals remains at a very low level of about 14-15% although in the study of Dhaliwal et al. (2005) about two third of cash deals were mainly debt financed. This result in my opinion indicates a data problem regarding the identification of cash deals and I therefore abstain from using these variables in the further empirical analysis. Table 1 summarizes descriptive statistics of the dependent variables for the analysis of the probability to observe a debt financed deal. The last two columns show the difference of the average tax rate, $\phi\tau_{acq}^C$ (see section 4.2 for details of the tax variables), between debt financed and equity financed acquisitions according to the employed definitions and the corresponding p-values using a standard t-test with unequal variances. For all definitions, the average tax rate is slightly higher for debt financed deals with a statistically significant difference. This is a first hint for a potential tax effect on the financing decision.

Table 1: Information about financing

Variable	Equal 1	Equal 0	% Equal 1	Δ Tax rate	P-value
$Debt_{i,j}$	698	3019	18.8%	0.005	0.020
$DebtB_{i,j}$	609	2797	17.9%	0.005	0.030
$DebtC_{i,j}$	591	759	43.8%	0.015	0.000
$Debt_{i,j}$, cash only	414	2321	15.1%	0.007	0.009
$DebtB_{i,j}$, cash only	340	2028	14.4%	0.008	0.003

Numbers of debt financed and non-debt financed deals according to $Debt_{i,j}$ refer to the baseline sample in Column (1) of Table 4. Δ Tax rate shows the difference of the average $\phi\tau_{acq}^C$ between debt financed and non-debt financed deals. The last column depicts the corresponding p-value of a standard t-test with unequal variances that this difference equals zero.

For the acquiring company's capital structure analysis the dependent variable is $\Delta Debt_{i,j}$ which is defined as the difference between the year-end debt to assets ratio of the acquirer after the acquisition and the corresponding pre-deal value. The figures used to calculate this variable stem from unconsolidated statements of the respective acquiring company. The empirical link between the financing decision for the acquisitions in my sample and the development of the capital structure is given by two facts. First, the change in the debt ratio is significantly higher in debt financed deals than in equity financed deals according to all of my definitions of the indicator for debt financing using a standard t-test with unequal variances. Second, a univariate analysis between the development of the debt ratio and the logarithm of the sum of dealvalues per acquirer in the considered period results in a positive and significant correlation. Therefore, it seems to be reasonable to analyse the capital structure of the acquiring companies during the deal period to better

understand the financing decisions with respect to acquisitions.

In the base sample with 4389 acquirer-company year observations, the debt ratio increases on average by 2.3 %-points during the deal period. The fraction of acquirers that increase their debt ratio is 57.3 %. The fraction of debt ratio increasers is only 56.6 % in the group of low tax acquirers (first quartile, i.e. $\phi\tau_{acq}^C < 26\%$) and 60.4 % for companies facing a relative high tax (last quartile, $\phi\tau_{acq}^C > 33\%$). The average tax rate for increasers is 0.3 %-points higher than for decreasers. This is only a small difference but it is statistically significant on the 10 %-level and a first hint for a relationship between the tax advantage of debt financing and the financing decision regarding corporate acquisitions.

4.2 Tax data

For the empirical analysis, I use tax data on the corporate and personal taxation in the year of the completion date in the respective acquirer country.¹⁴ τ_{acq}^C is the corporate income tax rate that combines national and local taxes. Since in some countries interest expenses are only deductible from the base of certain taxes¹⁵, the tax advantage of debt financing as depicted in equation (1) reduces to

$$\Delta TAX = \{[\tau_{acq}^C + (1 - \tau_{acq}^C)\tau_{acq}^P] - \tau_{acq}^I - (1 - \phi)\tau_{acq}^C\} rD, \quad (3)$$

where $(1 - \phi)$ is the fraction of $\phi\tau_{acq}^C$, for which interest deductibility is not possible. Accordingly, the tax advantage of debt reduces to

$$\Delta TAX = \{[\phi\tau_{acq}^C + \tau_{acq}^D] - \tau_{acq}^I\} rD \quad (4)$$

in the case of relevant personal taxation, where $\tau_{acq}^D := (1 - \tau_{acq}^C)\tau_{acq}^P$ and to

$$\Delta TAX = \phi\tau_{acq}^C rD \quad (5)$$

in the case of irrelevant personal taxation.

For τ_{acq}^P and τ_{acq}^I I use the top bracket tax rates on dividends and on interest for loans provided to companies, respectively. In my analysis, I employ $\phi\tau_{acq}^C$, τ_{acq}^D and τ_{acq}^I as

¹⁴The tax data is collected from the European Tax Handbooks edited by the International Bureau of Fiscal Documentation and from international tax surveys provided by Ernst & Young, PwC, and KPMG. Overesch and Voeller (2010) use this data as well and describe the composition of the tax rates in detail.

¹⁵For example, in Germany interest expenses are fully deductible from the corporate income tax base but only partly from the local business tax (Gewerbsteuer).

Table 2: Tax variables for acquirer countries in 2011

Acquirer country	$\phi\tau_{acq}^C$	τ_{acq}^D	τ_{acq}^I
Austria	0.2500	0.1875	0.2500
Belgium	0.3399	0.1650	0.1500
Bulgaria	0.1000	0.0450	0.0000
Cyprus	0.1000	0.1350	0.1000
Czech Republic	0.1900	0.1215	0.1500
Denmark	0.2500	0.3150	0.4750
Estonia	0.2100	0.0000	0.2100
Finland	0.2450	0.1480	0.2800
France	0.3444	0.2021	0.3130
Germany	0.2717	0.1822	0.2638
Greece	0.2000	0.1680	0.1000
Hungary	0.1900	0.1266	0.0000
Ireland	0.1250	0.4463	0.2700
Italy	0.2751	0.1581	0.1250
Japan	0.4035	0.2583	0.5000
Korea	0.2420	0.4178	0.3850
Latvia	0.1500	0.0850	0.1000
Lithuania	0.1500	0.1700	0.0000
Luxembourg	0.2880	0.1500	0.1000
Netherlands	0.2500	0.1875	0.2500
Norway	0.2800	0.0000	0.2800
Poland	0.1900	0.1539	0.1900
Portugal	0.2750	0.1559	0.1650
Romania	0.1600	0.1344	0.1600
Russia	0.2000	0.0720	0.1300
Singapore	0.1700	0.0000	0.2000
Slovakia	0.1900	0.0000	0.1900
Slovenia	0.2000	0.1600	0.2000
Spain	0.3000	0.1360	0.2100
Sweden	0.2630	0.2211	0.3000
Turkey	0.2000	0.1400	0.1500
Ukraine	0.2300	0.0385	0.0500
United Kingdom	0.2600	0.2672	0.5000
United States	0.3787	0.1348	0.4170

In the US, τ_{acq}^C was 0.4007 for non-manufacturers in 2011.

independent variables. The assignment of personal tax rates to countries is executed by using the acquirer country. In reality there might of course be many companies having shareholders abroad. Since I do not know where the shareholders of the specific companies live I cannot be sure that my tax rates really capture the personal tax burden. However, relying on the literature of home bias in investment decisions (e.g. French and Poterba (1991)) this procedure seems to be reasonable. Table 2 summarizes these tax variables for 2011. For comparison with Erickson (1998) and Dhaliwal et al. (2005) I conduct robustness checks using three dichotomous tax variables, $Tax1$, $Tax2$ and $Tax3$. These variables equal $\phi\tau_{acq}^C$ if the acquiring company is profitable in the pre-deal period and zero otherwise.

An acquirer is defined to be a member of a multinational group if there exists at least one 50 % corporate shareholder or 50 % subsidiary abroad.¹⁶ In order to test H 4 I restrict the sample to acquirer companies that are members of a multinational group and employ the following variables.

Grouptax is an indicator variable that equals one if the acquirer and the target company are located in the same country and the target country applies a group taxation regime which allows an offsetting of profits and losses of different entities within one group of companies for tax purposes.¹⁷ If the acquirer company can offset losses arising due to high interest expenses after a debt financed deal with profits of the target, the probability to observe a debt financed deal should be higher. If a profitable acquirer can use an existing loss carry-forward of the target company to reduce its taxable income, the effect is supposed to be negative because the loss serves as a non-debt tax shield.

$\phi\tau_{acq}^C - \tau_{tar}^C$ is the difference between the acquirer and the target country tax rate.¹⁸ The higher this difference, the higher is the incentive to use debt for the financing of the acquisition because acquisition costs (interest expenses for the loan taken out for the deal) reduce the tax base in a high tax country and the gains from the acquisition (increasing profits in the target company due to synergies) are taxable in a low tax country.

Finally, I control for the weighted average tax rate of the whole multinational group in the acquisition year, $\phi\tau_{mean}^C$. The mean is weighted by the numbers of affiliates per country.¹⁹ Thus, a high value of this variable indicates that the multinational group is a high tax group because it mainly consists of subsidiaries in high tax countries. A higher average group tax rate is supposed to positively influence the probability to observe a debt financed deal because it is possible for other affiliates to take out a loan and then provide the money to the acquiring subsidiary in the form of equity. For the debt ratio analysis I use the weighted average tax rate of all affiliates outside the acquirer country,

¹⁶As I only have access to the current ownership structure of the acquiring companies in 2012, the multinational status does not vary over time. Thus, I might classify acquirers to be part of a multinational group although they were purely domestic in the year of the acquisition.

¹⁷Compare Drefler and Overesch (2013) for details of this variable. They generate and employ this indicator for years 1996 - 2007. I used the same variable and added information for years 2008 - 2011. For the debt ratio analysis I use *Grouptax2* which equals one if at least one target company is located in the acquirer country and group taxation is possible.

¹⁸For the debt ratio analysis I use the difference between the acquirer country tax rate and the average tax rate of the targets acquired in the considered period, $\phi\tau_{acq}^C - \tau_{tar\text{mean}}^C$.

¹⁹I employ tax rates from 190 countries for this analysis and assign it to the respective 50% corporate shareholders and subsidiaries. As I only have access to the current ownership structures in 2012, there might be affiliates in the multinational group which were not part of the group in the year of acquisition. By using the weighted means the bias by a missclassification of single affiliates should not be too large.

$\phi\tau_{mean\ outside}^C$, and interact this variable with $\phi\tau_{acq}^C$. A negative interaction effect indicates that the incentive to reduce the taxable income of the acquiring company by debt financing is higher if there are no other affiliates in high tax counties where the debt would lead to higher tax savings. Moreover, the multinational has a stronger incentive to provide an intragroup loan to the acquiring company by a low tax subsidiary for tax saving purposes if there are many low tax affiliates in the group. Definitions of all tax variables can be found in Table 10 in the Appendix and summary statistics are depicted in Table 3.

4.3 Control variables

The variables used in my analysis are listed in Table 10 in the Appendix. The following subsections describe in detail the control variables on the firm- and the country-level.

4.3.1 Firm-level data

In the empirical analysis I control for several firm-level variables coming from unconsolidated statements. The logarithm of the dealvalue in thousand EUR of deal j , $Ln\ Dealvalue_j$, is supposed to positively influence the probability to observe a debt financed deal because in large acquisitions the acquirer has to find many sources of capital to pay the price for the target company.²⁰ The logarithm of acquirer's i pre-deal total assets in thousand EUR, $Size_i$, is used as a proxy for the size. Larger companies might rather be able to use retained earnings for an acquisition and it is easier for them to issue new equity. As a consequence, larger acquirers are supposed to use less debt in a corporate acquisition. A high pre-deal acquirer debt to assets ratio, $Initial\ debt_i$, is expected to decrease the probability to observe a debt financed deal because for highly leveraged companies a further debt issuance might be very costly, for example, if banks demand a higher risk premium. However, a high pre-deal debt ratio might also reflect the debt capacity of the acquirer. Therefore, it can also have a positive impact on the probability to observe a debt financed deal. Using information about the profits before taxes, I construct an indicator variable for loss making acquiring companies, LCF_i . Acquirers without taxable income have no incentive to increase their leverage from a tax point of view. But it might be difficult to issue new equity for loss making firms and therefore they have to go to the capital market and maybe pay higher risk premia.²¹ In order to get more observations I match

²⁰For the analysis of the debt ratio of the acquiring companies during the acquisition period I take the sum of all dealvalues for the acquisitions undertaken by the considered company in the considered year. For the allocation of deals to a considered year I use the date of completion.

²¹Compare Erickson (1998) and Dhaliwal et al. (2005) for a detailed discussion of all these variables.

the ZEPHYR data with AMADEUS, a database containing information from financial statements of European companies between. The matching is executed using the acquirer identification number and the year before the completion date of the considered deal. Using these control variables, I get a sample of 3717 deals between 1998 and 2011 with acquirers in 31 countries for the analysis of the probability to observe a debt financed acquisition and a sample of 4389 acquirers in 34 countries for the debt ratio analysis.

In addition to the afore mentioned controls I use the following variables in my analysis which have a much smaller coverage mainly because most of them are only available in AMADEUS. a lower risk of financial distress might positively influence the probability to use debt for financing an acquisition.²² In my analysis, I use Altman's (2000) Z-score as a continuous measure of the financial distress risk. However I do not include the term for retained earnings because I cannot observe this variable in my data. In addition, I exclude the market equity to book debt term like MacKie-Mason (1990) does.²³ The variable used in my analysis is *Distress_i*. The higher this variable, the better is the acquirer's financial situation. The amount of the acquirers' pre-deal depreciation as a fraction of total assets, *D&A_i*, is a non debt tax shield.²⁴ The higher the depreciation the stronger the decrease of the taxable income. As a consequence, one can expect a negative relationship between depreciation and debt financing. However, a high amount of depreciation may also stand for a large value of replacement investments. Such a company might have to use more debt to finance all of its investments in the considered period. The fraction of tangible assets of the acquirer, *Tangibility_i*, may have a positive impact on debt financing because a large amount of tangibles serve as collateral. Furthermore, I employ the profitability of the acquirer measured by the pre-deal EBITDA divided by total assets, *Profitability_i*. I predict a negative relationship between this variable and the probability to observe a debt financed deal.²⁵ Apart from that, I control for the change in depreciation, tangibility and profitability during the deal period ($\Delta D\&A_i$, $\Delta Tangibility_i$ and $\Delta Profitability_i$) to capture the development of these variables over time.²⁶ Geared to former studies (e.g. Erickson (1998) and Dhaliwal et al. (2005)), I use an indicator for a loss making target company, *LCF_j*, because existing loss carry forwards may be offset with future profits and accordingly serve as a non-debt tax shield. In this case the acquirer is expected to use less debt for the acquisition.²⁷ Considering all these additional variables the sample size

²²Compare Gosh et al. (2011).

²³MacKie-Mason (1990) argues that in an analysis of the capital structure the debt ratio should be considered separately. In addition, I only observe the market value for very few firms.

²⁴Compare e.g. De Angelo and Masulis (1980).

²⁵Compare Overesch and Voeller (2010) and Gosh(2011) for a discussion of the impact of this variable.

²⁶The change of these variables is computed using the difference between the post- and pre-deal values in ZEPHYR. For the matching with AMADEUS I use the year of deal completion for post-deal values.

²⁷For the analysis of the debt ratio of the acquiring companies during the acquisition period I use an

reduces to 940 deals and 16 acquirer countries between 2002 and 2011 for the analysis of the probability to observe a debt financed acquisition and to 1194 acquirers in 21 countries and years 2001 to 2011 for the debt ratio analysis. Table 3 provides summary statistics of the independent variables used in the regression analysis. The number of observations per acquirer country can be found in the Appendix in Table 11 for the analysis of the probability to observe a debt financed deal and in Table 12 for the debt ratio analysis.

4.3.2 Country level data

Apart from the firm-level data I also control for some time varying acquirer country-specific variables provided by the Worldbank. $Inflation_{acq}$ is supposed to have a positive impact on debt financing according to De Angelo and Masulis (1980). They state that inflation reduces the real value of tax shields. However, there are studies like Huizinga et al. (2008) finding a negative effect. The authors argue that inflation causes uncertainty about the real interest rate. Another factor are the credit market conditions measured by the domestic credit by banks as a percentage of GDP, $Domestic\ credit_{acq}$. The hypothesis is that better credit market conditions make it easier to issue new debt for a corporate acquisition. In contrast, high valuation of domestic firms measured by the stock market capitalization of listed firms in percent of the GDP, $Stock\ market_{acq}$, may increase the probability to observe an equity financed deal. The reason is that overvaluation makes firms yielding higher prices for new equity and therefore creates an incentive for equity financing.²⁸ For the same reason I control for the $GDP\ growth_{acq}$. In a prosperous economic environment investors might rather choose to directly participate in companies through the equity capital market. Summary statistics for these variables are depicted in Table 3.

indicator that equals one if at least one of the acquired target companies has a loss in the pre-deal period for the acquisitions undertaken by the considered acquirer in the considered year.

²⁸Compare Myers and Majlut (1984).

Table 3: Summary statistics for independent variables

Logit analysis		OLS analysis									
Variable	Obs.	Mean	Std. Dev.	Min.	Max.	Variable	Obs.	Mean	Std. Dev.	Min.	Max.
$\phi\tau_{acq}^C$	3717	0.294	0.051	0.100	0.473	$\phi\tau_{acq}^C$	4389	0.290	0.052	0.100	0.473
$\phi\tau_{acq}^D$	3717	0.180	0.098	0	0.479	$\phi\tau_{acq}^D$	4389	0.170	0.098	0	0.479
$\phi\tau_{acq}^I$	3717	0.304	0.122	0	0.590	$\phi\tau_{acq}^I$	4389	0.284	0.126	0	0.590
$Tax1$	940	0.235	0.143	0	0.360	$Tax1$	1194	0.240	0.135	0	0.360
$Tax2$	940	0.198	0.157	0	0.360	$Tax2$	1194	0.212	0.148	0	0.360
$Tax3$	924	0.212	0.150	0	0.360	$Tax3$	1177	0.223	0.143	0	0.360
$GroupTax$	770	0.594	0.491	0	1	$GroupTax2$	882	0.608	0.489	0	1
$\phi\tau_{acq}^C - \tau_{tar}^C$	762	0.003	0.040	-0.184	0.20	$\phi\tau_{acq}^C - \tau_{tar}^{Cmean}$	875	0.004	0.039	-0.184	0.200
$\phi\tau_{acq}^{Cmean}$	773	0.304	0.037	0.100	0.37	$\phi\tau_{acq}^{Cmean outside}$	885	0.289	0.049	0.100	0.404
$Dealvalue_j$	3717	221865.4	1668557.0	0.1	55300000.0	$Dealvalue_j$	4389	174172.6	1373001.0	0.1	55300000.0
$Size_i$	3717	11.477	2.554	1.099	18.583	$Size_i$	4389	11.316	2.455	1.099	18.581
$Initial\ debt_i$	3717	0.504	0.254	0	0.999	$Initial\ debt_i$	4389	0.516	0.255	0	1
LCF_i	3717	0.244	0.429	0	1	LCF_i	4389	0.217	0.412	0	1
$Inflation_{acq}$	3717	2.8	2.4	-1.3	22.5	$Inflation_{acq}$	4389	3.0	2.7	-4.5	25.2
$Domestic\ credit_{acq}$	3717	127.8	51.7	13.9	337.8	$Domestic\ credit_{acq}$	4389	123.8	55.3	13.9	337.8
$GDP\ growth_{acq}$	3717	2.4	2.5	-14.3	14.8	$GDP\ growth_{acq}$	4389	2.4	2.9	-14.8	14.8
$Stock\ market_{acq}$	3717	83.1	41.6	8.2	323.7	$Stock\ market_{acq}$	4389	78.9	40.8	3.8	323.7
$Distress_i$	940	0.835	1.143	-2.926	7.054	$Distress_i$	1194	1.037	1.178	-2.926	8.663
$D\&A_i$	940	0.024	0.037	-0.013	0.381	$D\&A_i$	1194	0.027	0.035	-0.013	0.381
$\Delta D\&A_i$	940	-0.006	0.031	-0.381	0.174	$\Delta D\&A_i$	1194	-0.004	0.024	-0.380	0.174
$Tangibility_i$	940	0.101	0.166	0	0.926	$Tangibility_i$	1194	0.130	0.182	0	0.937
$\Delta Tangibility_i$	940	-0.013	0.064	-0.573	0.549	$\Delta Tangibility_i$	1194	-0.014	0.073	-0.573	0.549
$Profitability_i$	940	0.042	0.121	-0.864	0.679	$Profitability_i$	1194	0.061	0.118	-0.864	0.679
$\Delta Profitability_i$	940	-0.005	0.088	-0.797	0.698	$\Delta Profitability_i$	1194	-0.003	0.230	-0.797	7.369
LCF_j	940	0.344	0.475	0	1	LCF_j	1194	0.373	0.484	0	1

The table shows figures for the base sample for the logit analysis of the probability to observe a debt financed deal with dependent variable $Debt_{i,j}$ on the left side. On the right side the table depicts figures for the ordinary least square debt ratio analysis with dependent variable $\Delta Debt_{i,j}$. The variables with a lower number of observations are not included in the base specifications due to missing data.

5 Empirical Approach

The first approach employed in this paper models the probability to observe a debt financed acquisition. The hypothesis is that higher tax rates increase this probability. In other words, acquirers are supposed to use debt rather than equity if they face higher taxes. The dependent variable in this logit model is an indicator, $Debt_{i,j}$, that equals one if the deal is at least partly debt financed and equals zero for fully equity financed acquisitions. Let J be the number of acquisitions in the sample and

$$V_{i,j} := \alpha_1 \cdot \phi \tau_{acq}^C + \alpha_2 \cdot \tau_{acq}^D + \alpha_3 \tau_{acq}^I + \mathbf{X}_{i,j} \boldsymbol{\beta} + \delta_c + \delta_t + \delta_{ind} + \epsilon_{i,j} \quad (6)$$

be the unobservable part of the value of acquiring firm i that is determined by the capital structure choice for a given acquisition j , where $\phi \tau_{acq}^C$, τ_{acq}^D and τ_{acq}^I are the applicable tax rates in the acquirer country, $\mathbf{X}_{i,j}$ is a matrix of control variables, δ_c , δ_t and δ_{ind} are acquirer-country-, time- and acquirer-industry-dummies²⁹ and $\epsilon_{i,j}$ is an extreme value distributed error term. The α s, $\boldsymbol{\beta}$ and the δ s are parameters to be estimated and are dependent from the choice of financing. Then, the probability to observe a debt financed deal equals

$$P(debt_{i,j} = 1) = P(V_{i,j}^{debt} > V_{i,j}^{no\ debt}) = \frac{\exp(\tilde{\mathbf{X}}_{i,j} \tilde{\boldsymbol{\beta}})}{1 + \exp(\tilde{\mathbf{X}}_{i,j} \tilde{\boldsymbol{\beta}})}, \quad (7)$$

where $\tilde{\mathbf{X}}_{i,j} \tilde{\boldsymbol{\beta}}$ is the right part of equation (6) without $\epsilon_{i,j}$. Maximizing the log-likelihood

$$\text{Log}L = \sum_{j \in J} debt_{i,j} \cdot \log(P(debt_{i,j} = 1)) + (1 - debt_{i,j}) \cdot \log(1 - P(debt_{i,j} = 1)) \quad (8)$$

with respect to $\tilde{\boldsymbol{\beta}}$ yields the estimates for the parameters of interest showing the effect of the independent variables on the probability to observe a debt financed acquisition ($debt_{i,j} = 1$).³⁰

Alternatively, I take a look at the development of the whole capital structure of the acquiring companies during the deal period. In that case the dependent variable is a continuous one, namely the difference between the debt to assets ratio after and before the deal, $\Delta Debt_{i,j}$. The main hypothesis here is that higher tax rates create an incentive for acquiring firms to increase their debt ratios during the acquisition period. The

²⁹Classification into one of 21 industries is conducted by using the first two digits of the NACE Rev. 2 codes (broad structure, compare Eurostat (2008)).

³⁰Compare Green (2012) for equations (7) and (8).

specification is the same compared to the logit model:³¹

$$\Delta debt_i = \alpha_1 \cdot \phi \tau_{acq}^C + \alpha_2 \cdot \tau_{acq}^D + \alpha_3 \tau_{acq}^I + \mathbf{X}_i \boldsymbol{\beta} + \delta_c + \delta_t + \delta_{ind} + \epsilon_i. \quad (9)$$

Now the error term is supposed to be normally distributed and the parameters are estimated using ordinary least squares (OLS). Those parameters now show the linear relationship between the change in the debt ratio and the independent variables.

6 Regression Results

Table 4 shows logit regression results for the analysis of the probability to observe a debt financed acquisition. The dependent variable is $Debt_{i,j}$. Column (1) is the baseline regression including those control variables with a relatively high coverage. The tax advantage of debt, measured by $\phi \tau_{acq}^C$ seems not to influence the probability to observe a debt financed acquisition. In contrast, some control variables have significant impact. A higher dealvalue increases the likelihood to use debt for financing the deal since equity alone might not be sufficient. Larger acquirers are less likely to use debt. The reason can be the low costs to issue new equity, for example for listed firms. The negative coefficient of the loss dummy, LCF_i , indicates that acquirers without taxable income have a lower incentive to use debt for the financing of a corporate acquisition in order to further reduce the tax base. $Inflation_{acq}$ has a negative impact, which is in line with findings in former studies like Huizinga et al. (2008), and the $GDP\ growth_{acq}$ rate significantly lowers the probability for debt financing which might reflect that in good economic times it is easier for firms to issue equity because investors are less risk averse and thus more willing to hold direct interest in companies. The other variables $Initial\ debt_i$, $Domestic\ credit_{acq}$ and $Stock\ market_{acq}$ do not significantly influence the financing decision according to my findings.

Column (2) repeats the first regression using a smaller sample where the full set of control variables is not missing. Results now change with respect to the tax variable. The coefficient of $\phi \tau_{acq}^C$ becomes larger and significant.³² The results of the control variables are similar to specification (1). $Inflation_{acq}$ and $GDP\ growth_{acq}$ do not show a significant coefficient any more. In contrast, starting from Column (3), $Domestic\ credit_{acq}$ gets a

³¹As several acquirers appear in more than one year all variables are also time-dependent. I abstain from using a subscript for the year for simplicity.

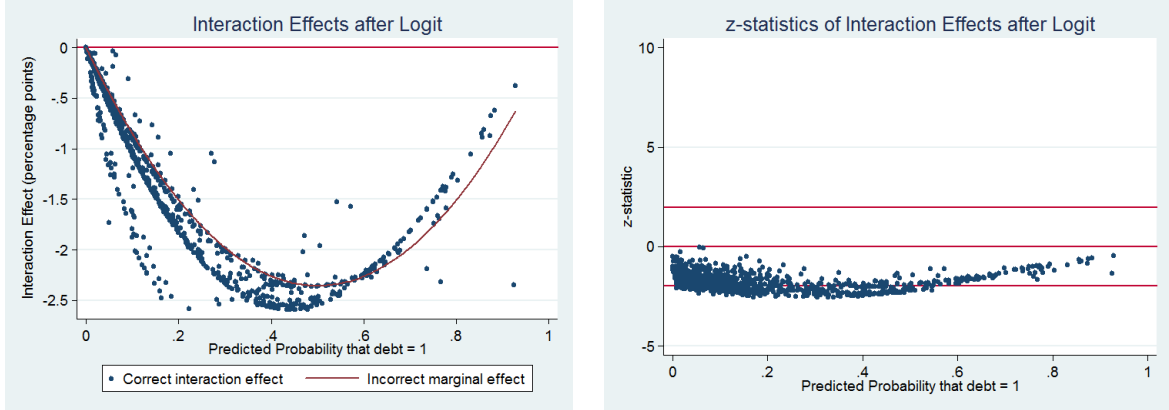
³²The change of the coefficient which comes from only reducing the sample size, might reflect, that the results in the whole sample are driven by some outliers from countries outside Europe or which do not report further information on company-specific variables.

Table 4: Logit analysis using $Debt_{i,j}$

	(1) Base	(2) Small sample	(3) Full model	(4) Profitable	(5) Interaction
$\phi\tau_{acq}^C$	1.3822 (0.712)	12.5342** (0.036)	12.6811** (0.035)	15.5527** (0.013)	13.5962** (0.023)
$\phi\tau_{acq}^C * LCF_i$					-9.4208* (0.063)
$Ln Dealvalue_j$	0.4703*** (0.000)	0.5769*** (0.000)	0.5792*** (0.000)	0.6051*** (0.000)	0.5775*** (0.000)
$Size_i$	-0.1523*** (0.000)	-0.1704*** (0.008)	-0.1910*** (0.010)	-0.1911** (0.027)	-0.1846** (0.013)
$Initial\ debt_i$	0.3203 (0.223)	0.6309 (0.177)	0.7654 (0.112)	0.3744 (0.490)	0.7370 (0.131)
LCF_i	-0.2181** (0.048)	-0.4047* (0.099)	-0.4559* (0.097)		2.4247 (0.134)
$Inflation_{acq}$	-0.0921* (0.065)	-0.0562 (0.683)	-0.0485 (0.719)	-0.0830 (0.574)	-0.0519 (0.712)
$Domestic\ credit_{acq}$	0.0031 (0.427)	0.0147* (0.084)	0.0165** (0.048)	0.0216** (0.012)	0.0167** (0.044)
$GDP\ growth_{acq}$	-0.0808** (0.050)	0.0419 (0.671)	0.0385 (0.693)	-0.0070 (0.955)	0.0224 (0.814)
$Stock\ market_{acq}$	0.0016 (0.660)	-0.0069 (0.403)	-0.0059 (0.479)	-0.0115 (0.261)	-0.0063 (0.443)
$Distress_i$			-0.0411 (0.784)	0.0557 (0.749)	-0.0389 (0.798)
$D\&A_i$			-4.3418 (0.386)	0.2372 (0.964)	-4.4296 (0.381)
$\Delta D\&A_i$			3.8629 (0.527)	0.1648 (0.979)	3.7947 (0.535)
$Tangibility_i$			0.7422 (0.335)	-0.1461 (0.856)	0.6895 (0.386)
$\Delta Tangibility_i$			-2.5072* (0.094)	-2.6192 (0.180)	-2.5982* (0.087)
$Profitability_i$			-0.3800 (0.815)	-2.7293 (0.243)	-0.1692 (0.918)
$\Delta Profitability_i$			-0.4252 (0.746)	0.5344 (0.699)	-0.4066 (0.758)
LCF_j			-0.2271 (0.215)	-0.0478 (0.830)	-0.2248 (0.218)
Observations	3717	940	940	697	940
Log likelihood	-1498.85	-373.52	-369.26	-284.16	-367.95
Sensitivity	18.19 %	35.86 %	35.86 %	46.67 %	36.87 %
Specificity	97.28 %	95.28 %	95.96 %	93.42 %	95.96 %
%-pts improved	1.21	3.83	4.36	6.02	4.57

The table shows logit regressions with dependent variable $Debt_{i,j}$. Independent variables are defined in Table 10. In column (1), the sample consists of domestic and cross border deals between 1998 and 2011 with an acquirer in one of 31 countries. Column (2) restricts the sample to observations where additional control variables are not missing and column (3) adds these controls. In column (4), the sample only consists of profitable acquiring companies and in column (5), an interaction term between $\phi\tau_{acq}^C$ and LCF_i is used to identify a difference in the tax effect for loss making and profitable firms. All specifications include acquirer-country-, year- and industry-fixed effects. Standard errors are clustered on the acquirer-country-year level. P-values are shown in parentheses. * denotes significance at the 10 %-level, ** at the 5 %-level and *** at the 1 %-level. Compare Table 11 for numbers of observations per acquirer country.

Figure 1: Interaction effect, $\phi\tau_{acq}^C * LCF_i$, in column (5) of Table 4



positive and significant coefficient indicating that the access to the capital market is important for the financing decision, too. Column (3) adds the additional control variables with smaller coverage. Results do not materially change. Except of $\Delta Tangibility_i$, the new variables all do not have any statistically significant impact on the financing decision.³³

In column (4) I restrict the sample to profitable acquirers. That is why the loss dummy, LCF_i , cancels out in this specification. The coefficient of $\phi\tau_{acq}^C$ corresponds to an average marginal effect of 2.03. This means that in my sample a one $\%$ -point raising tax rate is on average associated with a 2.03 $\%$ -points increase of the probability to observe a debt financed deal. The average marginal effect for $Ln Dealvalue_j$ is 0.08 indicating that a one percent increase in the dealvalue increases the probability to observe a debt financed deal by 8 $\%$ -points. For $Size_i$, the average marginal effect is -0.02. In the last column of Table 4, I use an interaction term between the tax variable and the loss dummy, $\phi\tau_{acq}^C * LCF_i$, to evaluate the difference of the tax advantage between profitable and loss making firms. Since the logit model is non-linear, the coefficients and p-values do not show the real interaction effects and results have to be calculated for every observation.³⁴ Figure 1 shows the real interaction effects and the corresponding z-statistics. As we see, the interaction effect is negative for all observations. However, concerning the significance, the results are mixed. The interaction effect is only significant for a smaller part of observations. For a large group of acquisitions especially with small or large predicted probabilities for debt financing the interaction is insignificant.

Concerning the model fit one can take a look at the *Sensitivity (Specificity)* at the bottom of Table 4 which shows the percentage of correctly predicted debt financed (non-

³³The negative coefficient of $\Delta Tangibility_i$ in Column (3) and (5) might reflect the non-debt tax shield generated by future depreciation.

³⁴Compare Ai and Norton (2003).

debt financed) deals. Another indicator is the *%-pts improved* figure which shows the additional percentage of deals correctly specified by my model compared to just guessing that all deals are non-debt financed. For specification (4) this number means that I predict 6.02 %-points more financing decisions correctly compared to labeling all acquisitions as equity financed.

Table 5 presents results for the ordinary least square debt ratio analysis. The dependent variable here is the change in the debt to assets ratio of the respective acquirer after the deal compared to the pre-deal value, $\Delta Debt_{i,j}$. Apart from that, specifications are identical to Table 4. The tax variable $\phi\tau_{acq}^C$ significantly influences the debt ratio across all specifications. The coefficients range between 0.28 and 0.58. The effect in specifications containing the full set of controls (column (3)-(5)) is between 0.52 and 0.55. Remarkably, the tax effect seems not to be very different for profitable and loss making firms. The coefficient of the interaction term is insignificant in column (5). If I restrict the sample to profitable acquirers in column (4) the coefficient becomes even slightly lower. One reason for the insignificant interaction might be that the loss dummy is not a very accurate measure to identify companies without taxable income because my variables come from accounting data which might be different from tax data. Another reason can be that I only look at the short run. In the long run even loss making acquirers can be very profitable. If they already anticipate this in the acquisition year, they nevertheless might use debt in order to offset future profits with interest expenses.

In this model, the coefficients can directly be interpreted as average marginal effects. Accordingly, the tax coefficient in column (4) means that a one %-point tax rate increase is associated with an increase in the change of the debt ratio of 0.53 %-points. In other words, the debt ratio on average increases more or decreases less by 0.53 %-points compared to another acquirer facing a one %-point lower tax rate and being equal in all other considered characteristics.

Coming to the control variables, the deal values and the size of the acquiring company have the same expected effects as in the logit analysis. If the sum of deal values of all acquisitions undertaken by the considered acquirer increases by one percent the acquirer's debt ratio increases by additional 0.01 %-points according to column (4). The amount of the acquirer's size coefficient is similar indicating that the economic importance of those effects is rather small. The pre-deal debt ratio of the acquiring company has a negative impact on the capital structure development. A one %-point higher initial debt ratio decreases the change in the capital structure by 0.22 %-points. Another significant factor is the stock market capitalization. $Stock\ market_{acq}$ has the expected negative coefficient

Table 5: OLS analysis using $\Delta Debt_{i,j}$

	(1) Base	(2) Small sample	(3) Full model	(4) Profitable	(5) Interaction
$\phi\tau_{acq}^C$	0.2840** (0.039)	0.5836*** (0.010)	0.5519** (0.016)	0.5275** (0.024)	0.5212** (0.028)
$\phi\tau_{acq}^C * LCF_i$					0.2857 (0.480)
$Ln Dealvalues_j$	0.0107*** (0.000)	0.0092*** (0.000)	0.0104*** (0.000)	0.0106*** (0.000)	0.0104*** (0.000)
$Size_i$	-0.0125*** (0.000)	-0.0103*** (0.000)	-0.0089*** (0.005)	-0.0097*** (0.002)	-0.0091*** (0.003)
$Initial\ debt_i$	-0.2462*** (0.000)	-0.2403*** (0.000)	-0.2629*** (0.000)	-0.2183*** (0.000)	-0.2616*** (0.000)
LCF_i	-0.0145* (0.060)	-0.0231* (0.079)	-0.0041 (0.783)		-0.0919 (0.477)
$Inflation_{acq}$	0.0018 (0.295)	0.0024 (0.580)	0.0033 (0.408)	0.0053 (0.197)	0.0033 (0.410)
$Domestic\ credit_{acq}$	-0.0002 (0.357)	0.0004 (0.205)	0.0003 (0.278)	0.0004 (0.280)	0.0003 (0.307)
$GDP\ growth_{acq}$	0.0012 (0.385)	0.0009 (0.802)	0.0013 (0.690)	-0.0017 (0.575)	0.0013 (0.676)
$Stock\ market_{acq}$	-0.0001 (0.495)	-0.0007** (0.036)	-0.0007** (0.042)	-0.0008** (0.011)	-0.0007* (0.055)
$Distress_i$			0.0169*** (0.003)	0.0179*** (0.006)	0.0168*** (0.003)
$D\&A_i$			-0.0554 (0.767)	0.1167 (0.616)	-0.0612 (0.744)
$\Delta D\&A_i$			0.5045* (0.087)	0.4750 (0.343)	0.4871* (0.096)
$Tangibility_i$			0.0658* (0.062)	0.0826*** (0.007)	0.0653* (0.064)
$\Delta Tangibility_i$			0.0233 (0.772)	-0.0630 (0.463)	0.0194 (0.813)
$Profitability_i$			-0.0247 (0.761)	-0.1832** (0.024)	-0.0287 (0.723)
$\Delta Profitability_i$			-0.0647** (0.040)	-0.0432*** (0.006)	-0.0644** (0.040)
$LCFs_j$			0.0034 (0.705)	0.0005 (0.955)	0.0029 (0.741)
Observations	4389	1194	1194	927	1194
Adj. R^2	0.17	0.15	0.17	0.15	0.17

The table shows OLS regressions with dependent variable $\Delta Debt_{i,j}$. Independent variables are defined in Table 10. In column (1), the sample consists of domestic and cross border deals between 1998 and 2011 with an acquirer in one of 34 countries. Column (2) restricts the sample to observations where additional control variables are not missing and column (3) adds these controls. In column (4), the sample only consists of profitable acquiring companies and in column (5), an interaction term between $\phi\tau_{acq}^C$ and LCF_i is used to identify a difference in the tax effect for loss making and profitable firms. All specifications include acquirer-country-, year- and industry-fixed effects. Standard errors are clustered on the acquirer-country-year level. P-values are shown in parentheses. * denotes significance at the 10 %-level, ** at the 5 %-level and *** at the 1 %-level. Compare Table 12 for numbers of observations per acquirer country.

although it is very small from an economic point of view. $Distress_i$ positively influences the change in the debt ratio indicating that acquiring companies facing a lower risk of financial distress tend to use debt to finance their acquisitions. The positive coefficient of $\Delta D\&A_i$ might reflect that a new investment increases the need to rely on additional debt financing. Concerning the tangibility, I find a positive impact. The profitability and especially the change of this variable during the acquisition period influences the development of the acquirers' capital structure in a negative way. The reason might be that profitable firms are rather able to use retained earnings to finance an investment. The other variables, namely $Inflation_{acq}$, $Domestic\ credit_{acq}$, $GDP\ growth_{acq}$, $D\&A_i$, $\Delta\ Tangibility_i$ and $LCFs_j$ do not significantly influence the change in the capital structure of the acquiring companies during the deal period according to my findings.

Table 6 shows regression results for specifications dealing with H4 about multinational companies' financing decisions. The specifications are based on Column (3) of Table 4 for the logit analysis and on Column (3) of Table 5 for the ordinary least square debt ratio analysis. The sample is restricted to acquirer companies belonging to a multinational group. The first 3 columns contain logit regressions. In Column (1), I control for $Group\ tax$, an indicator variable that equals one if the acquirer and the target are located in the same country and the target country applies a group taxation regime which allows an offsetting of profits and losses of different entities within one group of companies for tax purposes. I interact this variable with the loss indicators for the acquirer and the target company in order to test if the offsetting of potential losses of the target or the acquiring company are more relevant. The effect of consolidation opportunities on the probability to observe a debt financed deal should be positive if the acquirer might suffer a loss after a debt financed deal because of high extra interest expenses. If a profitable acquirer company can lower its taxable income by using target loss carry-forwards as a non-debt tax shield, the need to finance the acquisition with debt for tax reasons is smaller. Thus, a negative effect is expected in this situation. Results do not indicate a statistically significant relationship between a group taxation regime and the financing decision of multinational acquirers. The reason might be that the loss indicators do not show the loss situation of past or future years. It might be, for example, that the target shows a tax loss carry-forward from periods more than one year ago that I do not observe.

Table 6: Multinational tax planning

	(1)	(2)	(3)	(4)	(5)	(6)
	Logit	Logit	Logit	OLS	OLS	OLS
$\phi\tau_{acq}^C$	14.5547** (0.022)	14.3820** (0.024)		0.7517*** (0.001)	0.7443*** (0.002)	2.3092*** (0.001)
<i>Grouptax</i>	-0.2676 (0.441)					
<i>LCF_i*Grouptax</i>	-0.1352 (0.821)					
<i>LCF_j*Grouptax</i>	0.7163 (0.156)					
$\phi\tau_{acq}^C - \tau_{tar}^C$		-2.8440 (0.310)				
$\phi\tau_{mean}^C$			8.7461* (0.071)			
<i>Grouptax2</i>				-0.0220** (0.023)		
<i>LCF_i*Grouptax2</i>				0.0260 (0.247)		
$\phi\tau_{acq}^C - \tau_{tar}^{Cmean}$					0.1334 (0.167)	
$\phi\tau_{mean\ outside}^C$						1.8037*** (0.010)
$\phi\tau_{acq}^C * \phi\tau_{mean\ outside}^C$						-6.0333*** (0.007)
<i>Ln Dealvalue(s)_j</i>	0.5741*** (0.000)	0.5689*** (0.000)	0.5767*** (0.000)	0.0096*** (0.000)	0.0099*** (0.000)	0.0099*** (0.000)
<i>Size_i</i>	-0.1847** (0.010)	-0.1583** (0.035)	-0.1683** (0.023)	-0.0074** (0.038)	-0.0071** (0.045)	-0.0074** (0.037)
<i>Initial debt_i</i>	0.4567 (0.435)	0.1954 (0.732)	0.4902 (0.387)	-0.2258*** (0.000)	-0.2242*** (0.000)	-0.2272*** (0.000)
<i>LCF_i</i>	-0.2916 (0.562)	-0.3921 (0.252)	-0.3453 (0.316)	-0.0168 (0.452)	0.0007 (0.964)	-0.0011 (0.937)
<i>Inflation_{acq}</i>	0.0907 (0.663)	0.0897 (0.668)	0.1180 (0.578)	0.0031 (0.596)	0.0035 (0.551)	0.0043 (0.451)
<i>Domestic credit_{acq}</i>	0.0191* (0.076)	0.0230** (0.028)	0.0179* (0.089)	0.0000 (0.974)	-0.0000 (0.905)	-0.0001 (0.690)
<i>GDP growth_{acq}</i>	0.1383 (0.233)	0.1718 (0.152)	0.1658 (0.149)	-0.0010 (0.756)	-0.0016 (0.636)	-0.0016 (0.622)
<i>Stock market_{acq}</i>	-0.0040 (0.657)	-0.0064 (0.531)	-0.0075 (0.362)	-0.0004 (0.259)	-0.0004 (0.343)	-0.0005 (0.205)
<i>Distress_i</i>	0.0572 (0.712)	0.0834 (0.593)	0.0515 (0.743)	0.0111* (0.071)	0.0104* (0.098)	0.0096 (0.126)
<i>D&A_i</i>	-7.6741 (0.132)	-8.0024 (0.122)	-7.4142 (0.141)	-0.0109 (0.969)	-0.0138 (0.961)	-0.0355 (0.900)
$\Delta D\&A_i$	2.0307 (0.751)	1.7231 (0.773)	2.3860 (0.696)	0.5068 (0.263)	0.5031 (0.264)	0.4961 (0.269)
<i>Tangibility_i</i>	1.0945 (0.254)	1.1188 (0.244)	1.1148 (0.254)	0.0660 (0.133)	0.0659 (0.131)	0.0749* (0.083)
$\Delta Tangibility_i$	-2.6173 (0.206)	-2.7476 (0.182)	-2.6301 (0.222)	0.0244 (0.841)	0.0281 (0.812)	0.0341 (0.770)
<i>Profitability_i</i>	-1.0405 (0.604)	-1.2273 (0.525)	-1.0191 (0.612)	-0.0269 (0.708)	-0.0195 (0.784)	-0.0224 (0.750)

to be continued on the next page

Table 6: Multinational tax planning (continued)

$\Delta Profitability_i$	-1.4894 (0.438)	-1.6774 (0.365)	-1.3573 (0.465)	-0.1910** (0.032)	-0.1975** (0.026)	-0.2054** (0.020)
$TarLCF(s)$	-0.6352* (0.065)	-0.2197 (0.271)	-0.1881 (0.345)	-0.0055 (0.545)	-0.0050 (0.590)	-0.0054 (0.546)
Observations	770	762	773	882	875	885
Log likelihood	-304.54	-301.98	-307.03	—	—	—
Sensitivity	38.32 %	39.16 %	37.13 %	—	—	—
Specificity	93.86 %	95.30 %	95.38 %	—	—	—
%-pts improved	3.51	4.85	4.39	—	—	—
Adj. R^2	—	—	—	0.15	0.15	0.15

The table shows logit regressions with dependent variable $Debt_{i,j}$ in columns (1) to (3) based on column (3) of Table 4 and OLS regressions with dependent variable $\Delta Debt_{i,j}$ in columns (4) to (6) based on column (3) of Table 5. Independent variables are defined in Table 10. In Columns (1) and (4), I control for a potential group tax regime, in Columns (2) and (5), I test if the financing decision is sensitive to the difference between acquirer and target country tax rates, in Columns (3) and (6), I test if the weighted average tax rate of the multinational group influences the financing decision. All specifications include acquirer-country-, year- and industry-fixed effects. Standard errors are clustered on the acquirer-country-year level. P-values are shown in parentheses. * denotes significance at the 10%-level, ** at the 5%-level and *** at the 1%-level.

In Column (2), I control for the difference between the acquirer and the target country tax rate in cross border acquisitions, $\phi\tau_{acq}^C - \tau_{tar}^C$ (for domestic acquisitions the variable equals zero). If this difference is very high, the acquirer has an incentive to use debt for the deal financing because acquisition costs (interest expenses) would reduce taxable income in the high tax country but acquisition gains (increased profits in the target company due to synergies) would be taxable in a low tax country. Results do not indicate a significant impact of the tax rate differential. This might be partly explained by the fact that it is not necessarily the acquiring company that has to bear the acquisition costs. The multinational can also take out a loan by a subsidiary in another high tax country and provide the capital in the form of equity to the acquiring entity. In order to test how tax rates from countries other than the acquirer country influence the financing decision of multinational groups, I use the mean tax rate of the acquiring multinational group, $\phi\tau_{mean}^C$, instead of the acquirer country tax rate in Column (3). I weight this mean by the number of subsidiaries in the respective countries in order to approximate if the acquiring group is a high tax or low tax group. The coefficient of $\phi\tau_{mean}^C$ is significant and positive. Thus, the tax rates of other countries, in which affiliates of the multinationals are located, seem to influence the financing decisions as well. However, the average marginal effect of 1.10 is smaller compared to specifications using $\phi\tau_{acq}^C$ of the acquirer country.

Columns (4) to (6) show results for the ordinary least square debt ratio analysis. In

Column (4), I again control for a possible group taxation regime in the target countries (*Grouptax2* equals 1 if at least one target is located in the same country like the acquirer and group taxation is possible). Results show that the change of the acquirer's debt ratio during the acquisition period is smaller if a tax consolidation is possible. This effect is only found for profitable acquiring companies. The negative coefficient of *Grouptax2* indicates that profitable acquirers which can use tax loss carryforwards of the target to lower their taxable income tend to abstain from highly debt financed acquisitions. For loss making acquirers the effect is not significant (using a test of joint significance of *Grouptax2* and $LCF_i * Grouptax2$).³⁵ In Column (5), I control for the difference between the acquirer tax rate and the mean of the target tax rates in the considered year. Just like in the logit analysis, this variable does not influence the financing decision of the acquiring company.³⁶ In Column (6), I test if the debt development of the acquiring company also depends on tax rates of affiliates of the multinational group in other countries. In particular, I interact the acquirer tax rate $\phi\tau_{acq}^C$ and the average tax rate of affiliates located outside the acquirer country, $\phi\tau_{mean\ outside}^C$.³⁷ The coefficient of $\phi\tau_{acq}^C$ shows the effect if the mean of the affiliates tax rates is zero. The negative interaction effect indicates, that the acquirer country tax rate effect decreases if the tax rate of other affiliates increases. This can be explained by two reasons. Firstly, the incentive to reduce the taxable income of the acquiring company by debt financing is higher if there are no other affiliates in high tax counties where the debt would lead to higher tax savings. Secondly, if there are many low tax affiliates in the group, the multinational has an incentive to provide an intragroup loan to the acquiring company by a low tax subsidiary for tax saving reasons.

³⁵However, this effect is not robust to a modification of *Grouptax2*. If this variable only equals one if at least one target company in the respective country shows a pre-deal loss, the significance for profitable acquirers disappear. This might be due to the imprecise measure of loss situations of target companies which relies on accounting figures of one year before the deal.

³⁶Results are similar if I use the minimum instead of the mean target company tax rates.

³⁷This mean is weighted by the numbers of affiliates per country. For the tax rates of affiliated companies I also use $\phi\tau^C$. Results do not materially change if I instead employ τ^C without ϕ .

Sensitivity analysis

Table 7 presents sensitivity analyses for the logit approach on the basis of column (4) of Table 4. The first two columns split the sample in small and large deals using the median of the relative deal size in percent of the acquirer size for separation.³⁸ The large and significant coefficient of the tax variable for the larger deals and an insignificant coefficient for the smaller deals indicate that it is especially the financing decision in large deals which is influenced by taxes.

In the third column I restrict the sample to observations where the acquirer has an initial debt ratio smaller than 75 % to capture that in many countries thin capitalization rules might restrict the deductibility of interest expenses from the corporate tax base if the leverage of the considered company is too high.³⁹ In most countries applying such rules there is a safe haven which is a pre-defined value for the debt to equity ratio. As long as companies stay below that value they do not have to be concerned about limitations of interest deductibility. In most countries this safe haven amounts 3 to 1 or is even higher. Therefore, I try to exclude all firms that might be near a critical value before the acquisition takes place by only keeping those firms showing a debt to assets ratio smaller than 75%. The coefficient of $\phi\tau_{acq}^C$ remains positive and significant. However, it is not larger compared to the coefficient in Column (4) of Table 4.⁴⁰

In specification (4), I drop all acquirer countries with observations in less than 3 years to control for outliers which does not change the results. In column (5) I introduce the personal taxation on the shareholder level in the analysis. The additional variables are the tax rate on dividend income, τ_{acq}^D and the tax rate on interest income from loans given to corporations, τ_{acq}^I . The effect of $\phi\tau_{acq}^C$ remains stable but the two additional variables have no significant impact. The reason is either that personal taxation does not matter for most of the companies or that the shareholders are not liable to taxation in the country of the acquiring company. In column (6) I only look at observations with an independent

³⁸The number of observation is not identical for both samples because some observations have to be dropped due to collinearity problems when further reducing the sample.

³⁹Weichenrieder and Windischbauer (2008), Hauffer and Runkel (2012) and Buettner et al. (2010) analyze if thin capitalization rules result in a reduction of internal debt and whether this increases fiscal revenue. Dreßler and Scheuering (2012) evaluate the effects of the introduction of a new thin capitalization rule in Germany in 2008.

⁴⁰I obtain similar results if I use other thresholds. The lower the threshold, the lower the coefficient of $\phi\tau_{acq}^C$. It would be desirable to find out precisely how near a company is at a critical point in the considered country. However, many countries only restrict the deductibility of interest for internal loans or do not or not only look at the debt ratio to derive if a company is treated by thin capitalization rules or not. Since my data do not allow to distinguish between internal and external debt I only use this rough method to extract companies that should not be concerned about limitations.

Table 7: Logit analysis using $Debt_{i,j}$ - sensitivity analysis

	(1) Smaller	(2) Larger	(3) Low debt	(4) > 2 years	(5) Personal	(6) Domestic
$\phi\tau_{acq}^C$	-6.0395 (0.437)	30.4793** (0.025)	11.5453* (0.060)	12.7918** (0.034)	16.2334*** (0.010)	15.8044 (0.467)
τ_{acq}^D					3.6627 (0.580)	3.3574 (0.767)
τ_{acq}^I					2.6255 (0.233)	5.3183 (0.137)
$\ln Dealvalue_j$	0.1880 (0.257)	0.7818*** (0.000)	0.5857*** (0.000)	0.6140*** (0.000)	0.6138*** (0.000)	0.5805*** (0.000)
$Size_i$	0.2620* (0.099)	-0.2830* (0.056)	-0.2046** (0.036)	-0.2035** (0.021)	-0.2003** (0.023)	-0.2649** (0.049)
$Initial\ debt_i$	0.1152 (0.931)	1.4906** (0.027)	0.4586 (0.539)	0.3790 (0.503)	0.4191 (0.454)	1.4118 (0.123)
$Inflation_{acq}$	-0.2313 (0.412)	0.0983 (0.554)	-0.2187 (0.291)	-0.0720 (0.630)	-0.0901 (0.533)	0.4719 (0.383)
$Domestic\ credit_{acq}$	0.0021 (0.920)	0.0447*** (0.001)	0.0228** (0.012)	0.0253*** (0.003)	0.0298*** (0.004)	0.0375** (0.027)
$GDP\ growth_{acq}$	-0.3437 (0.156)	0.1592 (0.465)	-0.0984 (0.476)	0.0481 (0.680)	-0.0043 (0.972)	-0.1457 (0.527)
$Stock\ market_{acq}$	-0.0379 (0.138)	-0.0262 (0.156)	-0.0057 (0.637)	-0.0124 (0.215)	-0.0072 (0.514)	-0.0099 (0.628)
$Distress_i$	0.0054 (0.990)	0.0825 (0.676)	-0.0973 (0.646)	-0.0535 (0.759)	0.0518 (0.766)	-0.3378 (0.191)
$D\&A_i$	-5.9354 (0.776)	0.4478 (0.960)	-4.6194 (0.474)	1.8563 (0.725)	0.1662 (0.975)	-8.0204 (0.505)
$\Delta D\&A_i$	52.7138** (0.038)	-3.0216 (0.737)	-3.1516 (0.647)	1.8148 (0.786)	0.1191 (0.985)	5.3237 (0.659)
$Tangibility_i$	0.1274 (0.952)	-1.9649* (0.087)	-0.1412 (0.861)	-0.6711 (0.409)	-0.0943 (0.907)	-0.4435 (0.829)
$\Delta Tangibility_i$	-7.9700* (0.072)	-3.3290 (0.120)	-3.4625 (0.128)	-3.6169* (0.086)	-2.4679 (0.206)	-2.2970 (0.657)
$Profitability_i$	-3.4006 (0.644)	-2.6489 (0.486)	-1.3099 (0.623)	-2.1159 (0.390)	-2.6473 (0.256)	5.9657 (0.161)
$\Delta Profitability_i$	-9.6511 (0.281)	3.7158 (0.160)	0.1999 (0.900)	1.1746 (0.419)	0.5404 (0.691)	0.5087 (0.866)
LCF_j	0.2368 (0.565)	-0.0014 (0.996)	-0.0023 (0.993)	-0.0457 (0.840)	-0.0609 (0.784)	0.1353 (0.770)
Observations	324	347	600	677	697	320
Log likelihood	-96.27	-149.35	-236.41	-271.63	-283.45	-118.41
Sensitivity	26.67 %	63.87 %	48.23 %	44.65 %	44.24 %	47.14 %
Specificity	97.49 %	90.79 %	94.34 %	93.82 %	93.80 %	95.60 %
%-pts improved	1.54	15.85	7.00	5.76	5.74	6.88

The table shows logit regressions with dependent variable $Debt_{i,j}$ based on column (4) in Table 4. Independent variables are defined in Table 10. Columns (1) and (2) split the sample in small and large deals. Column (3) restricts the sample to acquirers showing a pre-deal debt to assets ratio smaller than 75 %. In column (4), all acquirer countries with observations in less than 3 years are dropped. Column (5) introduces personal taxation into the analysis and column (6) restricts the sample to acquirers that are independent or do not have a global ultimate owner abroad. All specifications include acquirer-country-, year- and industry-fixed effects. Standard errors are clustered on the acquirer-country-year level. P-values are shown in parentheses. * denotes significance at the 10 %-level, ** at the 5 %-level and *** at the 1 %-level.

acquirer or where the acquiring company does not have a global ultimate owner in another country in order to capture the last point. For those firms the coefficients of the personal taxation variables should have significant impact if it matters for the financing decision. However, one limitation in my data is that I only observe the current ownership structure of the acquirer and not the data for the deal year. This can be the reason for the insignificant coefficient of τ_{acq}^C in this specification.

In Table 7, some independent variables lose significance most likely due to the reduced sample sizes. The coefficient of *Initial debt_i* becomes positive and significant in column (2). This might reflect the debt capacity of the acquiring companies.⁴¹

Table 8 provides results of analogous sensitivity analyses for the debt ratio regression (4) of Table 5. Columns (1) and (2) again split the sample in smaller and larger deals. Now the median sum of dealvalues per acquirer and year as a percentage of the acquirers pre-deal total assets is used for separation. Remarkably, the coefficient of the tax variable is not significant in both of the samples although it had significant impact in the whole sample.⁴²

In column (3), the sample is reduced to acquirers showing a pre-deal debt ratio smaller than 75%. The coefficient of $\phi\tau_{acq}^C$ now is larger as compared to column (4) of Table 5 indicating that the tax advantage is more relevant for firms that are not too much indebted before the acquisition and therefore do not have to take into account a possible treatment by thin capitalization rules after a debt financed deal. Column (4) restricts the sample to acquirer countries with observations in at least 3 years to control for outliers which does not change results qualitatively.

In column (5) and (6), I control for personal taxation at the shareholder level in the acquirer countries using τ_{acq}^D and τ_{acq}^I . The results indicate that personal taxation is not relevant for the financing decision of the acquiring companies in my sample, even not for those that have no global ultimate owner abroad (compare column (6)).⁴³

The control variables show similar coefficients compared to Table 5. The only difference is that *Inflation_{acq}* shows a significant positive coefficient in Column (3).

⁴¹This result is reverse to the findings in the debt ratio analysis. However, the positive coefficient here is only found for subsamples and is not robust to other specifications.

⁴²When I separate according to the absolute rather than the relative size of the deals I find that the tax variable has significant impact only for the smaller deals. For the larger deals I do not find significant tax effects even when looking at different subgroups like the 25% largest deals or the larger deals without the highest quantiles.

⁴³For such firms I argue that most personal shareholders should be resident in the country where the company is located.

Table 8: OLS analysis using $\Delta Debt_{i,j}$ - sensitivity analysis

	(1) Smaller	(2) Larger	(3) Low debt	(4) > 2 years	(5) Personal	(6) Domestic
$\phi\tau_{acq}^C$	0.2715 (0.319)	0.3802 (0.441)	0.6603** (0.025)	0.5041** (0.030)	0.5474** (0.034)	0.6865** (0.029)
τ_{acq}^D					0.0824 (0.655)	0.2391 (0.290)
τ_{acq}^I					0.0624 (0.464)	0.0711 (0.386)
$Ln Dealvalues_j$	0.0021 (0.427)	0.0217*** (0.004)	0.0121*** (0.000)	0.0103*** (0.000)	0.0106*** (0.000)	0.0087*** (0.003)
$Size_i$	-0.0026 (0.444)	-0.0185** (0.022)	-0.0098** (0.012)	-0.0094*** (0.003)	-0.0098*** (0.002)	-0.0063* (0.071)
$Initial\ debt_i$	-0.1006*** (0.000)	-0.3145*** (0.000)	-0.2583*** (0.000)	-0.2123*** (0.000)	-0.2178*** (0.000)	-0.1946*** (0.000)
$Inflation_{acq}$	0.0080 (0.147)	0.0032 (0.570)	0.0090* (0.082)	0.0049 (0.235)	0.0051 (0.221)	0.0019 (0.737)
$Domestic\ credit_{acq}$	0.0001 (0.818)	0.0008 (0.280)	0.0004 (0.222)	0.0004 (0.263)	0.0006 (0.196)	0.0007 (0.145)
$GDP\ growth_{acq}$	-0.0016 (0.720)	0.0021 (0.686)	-0.0020 (0.593)	-0.0018 (0.562)	-0.0017 (0.577)	0.0010 (0.804)
$Stock\ market_{acq}$	-0.0003 (0.355)	-0.0016** (0.019)	-0.0014*** (0.001)	-0.0009*** (0.007)	-0.0007** (0.031)	-0.0006 (0.184)
$Distress_i$	0.0066 (0.292)	0.0318*** (0.002)	0.0256*** (0.001)	0.0183*** (0.006)	0.0179*** (0.006)	0.0209*** (0.007)
$D\&A_i$	0.4536 (0.143)	-0.2382 (0.560)	0.1312 (0.628)	0.1593 (0.490)	0.1193 (0.607)	0.0818 (0.765)
$\Delta D\&A_i$	0.3565 (0.454)	0.3285 (0.637)	0.4120 (0.454)	0.4922 (0.332)	0.4711 (0.348)	0.2924 (0.632)
$Tangibility_i$	0.0415 (0.198)	0.1559** (0.019)	0.0994*** (0.005)	0.0785** (0.011)	0.0824*** (0.008)	0.0883** (0.025)
$\Delta Tangibility_i$	0.0719 (0.685)	-0.0638 (0.498)	-0.0999 (0.396)	-0.0725 (0.397)	-0.0613 (0.474)	-0.0499 (0.630)
$Profitability_i$	-0.1765* (0.065)	-0.3279** (0.011)	-0.2408*** (0.008)	-0.1895** (0.021)	-0.1840** (0.023)	-0.2094** (0.022)
$\Delta Profitability_i$	-0.2891* (0.053)	-0.0435*** (0.000)	-0.0466*** (0.006)	-0.0436*** (0.005)	-0.0435*** (0.006)	-0.0414*** (0.004)
$LCFs_j$	0.0018 (0.861)	-0.0063 (0.701)	0.0019 (0.867)	0.0023 (0.806)	0.0005 (0.956)	0.0007 (0.939)
Observations	463	464	750	900	927	687
Adj. R^2	0.06	0.21	0.17	0.14	0.15	0.12

The table shows OLS regressions with dependent variable $\Delta Debt_{i,j}$ based on column (4) in Table 5. Independent variables are defined in Table 10. Columns (1) and (2) split the sample in companies acquiring relatively small and large targets. Column (3) restricts the sample to acquirers showing a pre-deal debt to assets ratio smaller than 75%. In column (4) all acquirer countries with observations in less than 3 years are dropped. Column (5) introduces personal taxation into the analysis and column (6) restricts the sample to acquirers that are independent or do not have a global ultimate owner abroad. All specifications include acquirer-country-, year- and industry-fixed effects. Standard errors are clustered on the acquirer-country-year level. P-values are shown in parentheses. * denotes significance at the 10 %-level, ** at the 5 %-level and *** at the 1 %-level.

Comparison to Erickson (1998) and Dhaliwal et al. (2005)

Erickson (1998) and Dhaliwal et al. (2005) use a trichotomous tax variable which directly captures if the acquirer is a loss making company by giving to it the value zero if the company has an operating loss and a negative taxable income before the deal and half of the statutory tax rate if one of the two conditions is fulfilled. Only if both characteristics indicate a profitable firm, the tax variable equals the statutory tax rate.⁴⁴ In Table 9, I also employ such kind of variables for a better comparison with these former studies. In particular, I use three different dichotomous variables. All of them equal $\phi\tau_{acq}^C$ if the company is labeled as being profitable and zero if not.⁴⁵ *Tax1* equals zero if the acquiring company does not have a positive profit before the acquisition, i.e. if LCF_i equals 1. *Tax2* equals zero if the pre-deal operating profit measured by the EBIT is negative. And *Tax3* equals zero if the sum of all taxes relating to the pre-deal accounting period is less than or equal to zero. Columns (1) to (3) of Table 9 show results of logit specifications employing these dichotomous variables instead of $\phi\tau_{acq}^C$ and using the full set of control variables. Only *Tax1* shows a significant coefficient which is in line with findings in Table 4 where the tax advantage of debt also especially affected the financing decision of profitable acquirers. However, the coefficient is smaller using *Tax1*. Another difference compared to Table 4 is that the loss dummy for the acquirer now gets a positive and significant coefficient. The reason might be that, controlling for the tax effect of the loss carry-forward, this variable captures that firms in difficult economic situations have to finance their investments through the capital market because they do not have many retained earnings and investors avoid to place their money in those companies. However, these findings are not robust to the altered definitions of the dichotomous tax variable which can be seen in columns (2) and (3) of Table 9.

Columns (4) to (6) depict the same specifications for the debt ratio analysis. In these models none of the variables *Tax1*, *Tax2* and *Tax3* is found to significantly influence the financing decision of acquiring companies. This is not surprising because we already see in Table 5 that the tax advantage seems not to differ between loss making and profitable firms as described above.

⁴⁴The trichotomous tax variable was suggested by Graham (1996). It equals "zero if the acquiring firm has net operating losses and a negative taxable income in the year prior to the acquisition, one-half the top statutory tax rate if the acquiring firm had either a net operating loss, or negative taxable income in the year prior to the acquisition, and the top statutory tax rate if the acquirer had neither a net operating loss nor negative taxable income in the year prior to the acquisition", compare Erickson (1998), p. 285. The definition of this variable captures if the acquirer is near tax exhaustion. As an alternative measure, Erickson (1998) uses an indicator variable for a net operating loss.

⁴⁵I do not employ a trichotomous variable as I cannot observe the the companies' taxable profit but only accounting figures.

Table 9: Logit using $Debt_{i,j}$ and OLS using $\Delta Debt_{i,j}$ - dichotomous tax variables

	(1) Logit	(2) Logit	(3) Logit	(4) OLS	(5) OLS	(6) OLS
<i>Tax1</i>	11.1965*** (0.004)			0.0251 (0.930)		
<i>Tax2</i>		-0.2770 (0.751)			-0.0247 (0.563)	
<i>Tax3</i>			-0.3266 (0.657)			0.0319 (0.350)
$\ln Dealvalue(s)_j$	0.5762*** (0.000)	0.5734*** (0.000)	0.5696*** (0.000)	0.0104*** (0.000)	0.0104*** (0.000)	0.0102*** (0.000)
<i>Size_i</i>	-0.1824** (0.013)	-0.1865** (0.010)	-0.1835** (0.013)	-0.0088*** (0.005)	-0.0089*** (0.005)	-0.0087*** (0.007)
<i>Initial debt_i</i>	0.7360 (0.133)	0.7934* (0.092)	0.7375 (0.124)	-0.2631*** (0.000)	-0.2616*** (0.000)	-0.2633*** (0.000)
<i>LCF_i</i>	2.9674** (0.016)	-0.4678 (0.124)	-0.4600* (0.094)	0.0049 (0.957)	-0.0061 (0.720)	-0.0024 (0.871)
<i>Inflation_{a,cq}</i>	-0.0446 (0.751)	-0.0156 (0.906)	-0.0291 (0.823)	0.0047 (0.234)	0.0048 (0.234)	0.0043 (0.301)
<i>Domestic credit_{a,cq}</i>	0.0166** (0.045)	0.0150* (0.070)	0.0156* (0.059)	0.0002 (0.415)	0.0002 (0.415)	0.0003 (0.355)
<i>GDP growth_{a,cq}</i>	0.0280 (0.770)	0.0778 (0.429)	0.0728 (0.461)	0.0022 (0.510)	0.0021 (0.534)	0.0022 (0.502)
<i>Stock market_{a,cq}</i>	-0.0075 (0.324)	-0.0116 (0.135)	-0.0129* (0.093)	-0.0009** (0.013)	-0.0009** (0.012)	-0.0009** (0.012)
<i>Distress_i</i>	-0.0377 (0.805)	-0.0322 (0.829)	-0.0213 (0.889)	0.0173*** (0.003)	0.0177*** (0.002)	0.0167*** (0.004)
<i>D&A_i</i>	-4.3784 (0.385)	-3.8194 (0.443)	-3.5532 (0.470)	-0.0517 (0.784)	-0.0532 (0.780)	-0.0685 (0.719)
$\Delta D\&A_i$	3.8821 (0.525)	4.5209 (0.463)	3.9005 (0.514)	0.5144* (0.081)	0.5078* (0.089)	0.4980* (0.100)
<i>Tangibility_i</i>	0.6875 (0.390)	0.7753 (0.313)	0.7512 (0.325)	0.0651* (0.065)	0.0676* (0.056)	0.0640* (0.072)
$\Delta Tangibility_i$	-2.6220* (0.084)	-2.5726* (0.085)	-2.8168* (0.064)	0.0218 (0.789)	0.0226 (0.779)	0.0222 (0.788)
<i>Profitability_i</i>	-0.1420 (0.931)	-0.3043 (0.854)	-0.4735 (0.773)	-0.0263 (0.746)	-0.0191 (0.816)	-0.0334 (0.696)
$\Delta Profitability_i$	-0.3899 (0.769)	-0.3279 (0.805)	-0.1866 (0.888)	-0.0646** (0.038)	-0.0648** (0.038)	-0.0646** (0.040)
<i>LCF(s)_j</i>	-0.2185 (0.226)	-0.1945 (0.280)	-0.1949 (0.276)	0.0038 (0.671)	0.0038 (0.669)	0.0046 (0.607)
Observations	940	940	924	1194	1194	1177
Log likelihood	-368.06	-370.96	-367.45	—	—	—
Sensitivity	35.86 %	35.86 %	35.53 %	—	—	—
Specificity	96.09 %	94.61 %	94.50 %	—	—	—
%-pts improved	4.46	3.29	3.25	—	—	—
Adj. R^2	—	—	—	0.17	0.17	0.17

The table shows logit regressions with dependent variable $Debt_{i,j}$ in columns (1) to (3) based on column (3) of Table 4 and OLS regressions with dependent variable $\Delta Debt_{i,j}$ in columns (4) to (6) based on column (3) of Table 5. Independent variables are defined in Table 10. Columns (1) and (4) employ *Tax1*, columns (2) and (5) use *Tax2* and column (3) and (6) apply *Tax3* instead of $\phi\tau_{acq}^C$. All specifications include acquirer-country-, year- and industry-fixed effects. Standard errors are clustered on the acquirer-country-year level. P-values are shown in parentheses. * denotes significance at the 10 %-level, ** at the 5 %-level and *** at the 1 %-level.

All in all, I rather rely on results from Tables 4 and 5 because the dichotomous tax variables implicitly assume that the tax advantage of debt does only exist for firms which have taxable profits in the pre-deal period whereas by using $\phi\tau_{acq}^C$ and the loss dummy or an interaction I allow the data to decide about this issue.

For a better comparison of my results with findings of Erickson (1998) I also conduct the logit analysis for modeling the probability to observe a debt financed deal by employing another dependent variable, $DebtB_{i,j}$. This variable sharper distinguishes between debt financed deals and stock financed acquisitions and is defined in Section 4.3. Results are presented in Tables 13 to 16 in the Appendix. Generally, all results regarding the tax variables are similar to the output presented in the last sections. However, the levels of significance are lower using $DebtB_{i,j}$. Some of the control variables lose significance in several specifications, for example $Size_i$. In contrast, the significance of other variables gets stronger, especially for $Domestic\ credit_{acq}$ and $Stock\ market_{acq}$. However, I discussed the results of specifications using $Debt_{i,j}$ due to the larger coverage of this variable. Another advantage of $Debt_{i,j}$ is that I include both kinds of equity financed deals in the sample, financed by own shares and financed by retained earnings. Furthermore, I also employed $DebtC_{i,j}$ leading to qualitatively similar results, but I do not show them here because of the limited validity due to the very low numbers of observations (between 117 and 381 when including all control variables).

7 Conclusion

In this paper, I evaluate the effects of profit taxation on the financing decision of corporate acquisitions. Due to the deductibility of interest expenses from the corporate tax base acquiring companies can save taxes by financing a takeover with debt and afterwards offsetting the interest expenses with profits in the following periods. For the empirical analysis I employ two approaches.

The first approach deals with the particular decision how to finance the considered deal. Using information from ZEPHYR, a mergers and acquisitions database provided by Bureau van Dijk, I investigate the determinants of the question if a corporate acquisition should be financed with debt or equity. My sample consists of 3717 deals with acquirers in 31 countries. I find empirical evidence for the hypothesis that companies in high tax countries rather use debt than acquirers in low tax countries. This effect can especially be carved out for profitable acquirers. Problems regarding this kind of analysis might be that I do not observe how much debt is used and that the financing decision of acquisitions

may not be independent from other investments of the same company around the deal.

Therefore, in a second step, I investigate the whole capital structure development of the acquiring companies during the deal period. According to my findings, the change of the debt to assets ratio is 0.55 %-points higher if the tax advantage of debt increases by one %-point. However, I cannot accept the hypothesis that the tax advantage is relevant especially for profitable acquirers. Since the simple loss indicator variable does not contain information about the future development and the expectations of decision-makers, this result is not surprising. Even loss making firms might be very profitable in the future and consequently have an incentive to decrease taxable profits by additional interest expenses.

All in all, the financing decision in corporate acquisitions seems to be influenced by profit taxation leading to a larger fraction of debt financing in high tax countries. This can lead to economic distortions, for example the execution of acquisitions that would not be profitable in a world without interest deductibility.

Appendix

Table 10: Variable definitions

$\phi\tau_{acq}^C$	Fraction of interest expenses deductible from the corporate income tax base times the combined statutory corporate income tax rate in the completion year of the acquisition.
τ_{acq}^D	Additional taxation of dividend income on the personal level in the completion year of the acquisition, $= (1 - \tau_{acq}^C)\tau_{acq}^P$, where τ_{acq}^P is the personal tax rate on dividend income.
τ_{acq}^I	Additional taxation of interest income on the personal level in the completion year of the acquisition for loans given to companies.
<i>Tax1</i>	Dichotomous variable, $= \phi\tau_{acq}^C$ if acquirer's pre-deal profit before tax is larger than zero and zero otherwise.
<i>Tax2</i>	Dichotomous variable, $= \phi\tau_{acq}^C$ if acquirer's pre-deal EBIT is larger than zero and zero otherwise.
<i>Tax3</i>	Dichotomous variable, $= \phi\tau_{acq}^C$ if acquirer's pre-deal taxation is larger than zero and zero otherwise.
<i>Grouptax</i>	Indicator variable, equals one if the acquirer and the target company are located in the same country and the target country applies a group taxation regime.

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Table 10: Variable definitions (continued)

$\phi\tau_{acq}^C - \tau_{tar}^C$	Difference between the acquirer and the target country tax rate in the completion year of the acquisition. If acquirer and target are located in the same country, the variable is zero.
$\phi\tau_{mean}^C$	Weighted average tax rate of the whole multinational group in the acquisition year, the mean is weighted by the numbers of affiliates per country.
<i>Grouptax2</i>	Indicator variable, equals one if at least one target company is located in the acquirer country and group taxation is possible.
$\phi\tau_{acq}^C - \tau_{tar\,mean}^C$	Difference between the acquirer country tax rate and the average tax rate of the targets acquired in the considered period.
$\phi\tau_{mean\,outside}^C$	Weighted average tax rate of all affiliates outside the acquirer country, the mean is weighted by the numbers of affiliates per country.
<i>Ln Dealvalue_j</i>	Logarithm of the dealvalue of the acquisition in thousand EUR. For the debt ratio analysis the logarithm of the sum of values of all acquisitions undertaken by the acquirer in the considered year is used (<i>Ln Dealvalues_j</i>).
<i>Size_i</i>	Logarithm of the acquirer's pre-deal total assets in thousand EUR.
<i>Initial debt_i</i>	Acquirer's pre-deal debt to assets ratio.
<i>LCF_i</i>	Indicator variable, equals one if the acquirer's pre-deal book profit before tax is lower than zero and zero if it is equal or larger than zero.
<i>Inflation_{acq}</i>	Consumer price index in percent in the completion year of the acquisition.
<i>Domestic credit_{acq}</i>	Domestic credit provided by banking sector in percent of GDP in the completion year of the acquisition.
<i>GDP growth_{acq}</i>	Annual percentage growth rate of GDP at market prices in the completion year of the acquisition.
<i>Stock market_{acq}</i>	Market capitalization of listed companies in percent of GDP in the completion year of the acquisition.
<i>Distress_i</i>	= (1.2 * working capital + 3.3 * EBIT + 1.0 * sales)/total assets, pre-deal value for the acquirer, following Altman (2000) and MacKie-Mason (1990).
<i>D&A_i</i>	Acquirer's pre-deal depreciation and amortization as a fraction of total assets.
$\Delta D\&A_i$	Acquirer's change in depreciation and amortization as a fraction of total assets in the completion year of the acquisition compared to the pre-deal value.
<i>Tangibility_i</i>	Acquirer's pre-deal tangible assets as a fraction of total assets.

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Table 10: Variable definitions (continued)

$\Delta Tangibility_i$	Acquirer's change in tangible assets as a fraction of total assets in the completion year of the acquisition compared to the pre-deal value.
$Profitability_i$	Acquirer's pre-deal EBITDA as a fraction of total assets.
$\Delta Profitability_i$	Acquirer's change in EBITDA as a fraction of total assets in the completion year of the acquisition compared to the pre-deal value.
LCF_j	Indicator variable, equals one if the target's pre-deal book profit before tax is lower than zero and zero if it is equal or larger than zero. For the debt ratio analysis this indicator equals one if at least one of the acquired targets shows a negative income ($LCFs_j$).

Table 11: Observations per acquirer country - logit analysis

Country	(1) Frequency	(2) Percent	(3) Frequency	(4) Percent	(5) Frequency	(6) Percent
AT	28	0.75	5	0.53	4	0.57
BE	90	2.42	41	4.36	32	4.59
BG	15	0.4	7	0.74	5	0.72
CY	4	0.11	0	0	0	0
CZ	16	0.43	0	0	0	0
DE	209	5.62	42	4.47	31	4.45
DK	26	0.7	0	0	0	0
EE	10	0.27	0	0	0	0
ES	308	8.29	164	17.45	137	19.66
FI	146	3.93	77	8.19	49	7.03
FR	438	11.78	199	21.17	168	24.1
GB	704	18.94	0	0	0	0
GR	66	1.78	35	3.72	31	4.45
HU	16	0.43	2	0.21	0	0
IE	11	0.3	0	0	0	0
IT	318	8.56	161	17.13	121	17.36
JP	40	1.08	0	0	0	0
KR	308	8.29	0	0	0	0
LU	10	0.27	0	0	0	0
NL	20	0.54	0	0	0	0
NO	87	2.34	18	1.91	15	2.15
PL	165	4.44	13	1.38	8	1.15
PT	38	1.02	15	1.6	12	1.72
RO	39	1.05	12	1.28	10	1.43
RU	134	3.61	0	0	0	0
SE	356	9.58	147	15.64	74	10.62
SG	34	0.91	0	0	0	0
SI	21	0.56	0	0	0	0
TR	5	0.13	0	0	0	0
UA	7	0.19	2	0.21	0	0
US	48	1.29	0	0	0	0
Total	3,717	100	940	100	697	100

The table shows the number of observations per country for the analysis of the probability to observe a debt financed deal using $Debt_{i,j}$ as the dependent variable. Columns (1) and (2) show the respective numbers for the base specification (1) of Table 4. Columns (3) and (4) refer to specification (3) of Table 4, which includes all control variables. Columns (5) and (6) depict numbers for specification (4) of Table 4, which restricts the sample to profitable acquirers.

Table 12: Observations per acquirer country - debt ratio analysis

Country	(1) Frequency	(2) Percent	(3) Frequency	(4) Percent	(5) Frequency	(6) Percent
AT	25	0.57	5	0.42	4	0.43
BE	122	2.78	52	4.36	41	4.42
BG	22	0.5	10	0.84	9	0.97
CY	3	0.07	0	0	0	0
CZ	27	0.62	11	0.92	11	1.19
DE	222	5.06	44	3.69	34	3.67
DK	40	0.91	0	0	0	0
EE	33	0.75	8	0.67	8	0.86
ES	438	9.98	236	19.77	201	21.68
FI	164	3.74	64	5.36	46	4.96
FR	456	10.39	224	18.76	184	19.85
GB	643	14.65	0	0	0	0
GR	103	2.35	49	4.1	42	4.53
HU	19	0.43	3	0.25	2	0.22
IE	7	0.16	0	0	0	0
IT	428	9.75	239	20.02	187	20.17
JP	66	1.5	0	0	0	0
KR	331	7.54	0	0	0	0
LT	6	0.14	0	0	0	0
LU	8	0.18	0	0	0	0
LV	6	0.14	0	0	0	0
NL	23	0.52	1	0.08	0	0
NO	119	2.71	19	1.59	16	1.73
PL	249	5.67	32	2.68	23	2.48
PT	66	1.5	27	2.26	22	2.37
RO	50	1.14	14	1.17	12	1.29
RU	262	5.97	0	0	0	0
SE	360	8.2	143	11.98	76	8.2
SG	25	0.57	0	0	0	0
SI	28	0.64	5	0.42	5	0.54
SK	4	0.09	1	0.08	0	0
TR	5	0.11	0	0	0	0
UA	10	0.23	7	0.59	4	0.43
US	19	0.43	0	0	0	0
Total	4,389	100	1,194	100	927	100

The table shows the number of observations per country for the debt ratio analysis using $\Delta Debt_{i,j}$ as the dependent variable. Columns (1) and (2) show the respective numbers for the base specification (1) of Table 5. Columns (3) and (4) refer to specification (3) of Table 5, which includes all control variables. Columns (5) and (6) depict numbers for specification (4) of Table 5, which restricts the sample to profitable acquirers.

Table 13: Logit analysis using $DebtB_{i,j}$

	(1) Base	(2) Small sample	(3) Full model	(4) Profitable	(5) Interaction
$\phi\tau_{acq}^C$	-1.6514 (0.703)	8.6062 (0.148)	8.0917 (0.171)	10.5807* (0.086)	9.3755 (0.112)
$\phi\tau_{acq}^C * LCF_i$					-13.7596** (0.012)
$Ln Dealvalue_j$	0.4286*** (0.000)	0.5091*** (0.000)	0.5085*** (0.000)	0.5571*** (0.000)	0.5059*** (0.000)
$Size_i$	-0.1117*** (0.000)	-0.1021 (0.125)	-0.1124 (0.148)	-0.1353 (0.127)	-0.1024 (0.191)
$Initial\ debt_i$	0.4386 (0.109)	0.8097 (0.127)	0.8933* (0.093)	0.4425 (0.447)	0.8468 (0.120)
LCF_i	-0.3429*** (0.005)	-0.5685** (0.047)	-0.6352* (0.053)		3.5816** (0.044)
$Inflation_{acq}$	-0.1069* (0.061)	-0.0257 (0.854)	-0.0149 (0.911)	-0.0407 (0.783)	-0.0155 (0.913)
$Domestic\ credit_{acq}$	0.0055 (0.213)	0.0259*** (0.004)	0.0283*** (0.001)	0.0300*** (0.001)	0.0288*** (0.001)
$GDP\ growth_{acq}$	-0.0654 (0.164)	0.1020 (0.397)	0.0919 (0.449)	0.0151 (0.921)	0.0728 (0.541)
$Stock\ market_{acq}$	0.0011 (0.793)	-0.0184** (0.037)	-0.0186** (0.031)	-0.0252** (0.014)	-0.0196** (0.018)
$Distress_i$			0.0127 (0.934)	0.1212 (0.492)	0.0209 (0.893)
$D\&A_i$			-2.0068 (0.738)	1.7786 (0.764)	-2.0562 (0.737)
$\Delta D\&A_i$			6.9485 (0.302)	2.0466 (0.765)	7.0474 (0.299)
$Tangibility_i$			0.7879 (0.341)	0.0544 (0.950)	0.6546 (0.444)
$\Delta Tangibility_i$			-3.3501* (0.050)	-3.4108 (0.108)	-3.6108** (0.037)
$Profitability_i$			-0.9067 (0.619)	-3.1535 (0.248)	-0.6440 (0.729)
$\Delta Profitability_i$			-0.1296 (0.926)	0.5939 (0.705)	-0.1687 (0.906)
LCF_j			-0.2542 (0.214)	-0.1121 (0.632)	-0.2705 (0.185)
Observations	3406	844	844	631	844
Log likelihood	-1324.94	-326.60	-321.19	-257.02	-319.01
Sensitivity	18.06 %	35.84 %	37.57 %	47.65 %	38.15 %
Specificity	97.57 %	95.83 %	95.23 %	94.61 %	95.38 %
%-pts improved	1.23	4.03	3.91	7.13	4.15

The table shows logit regressions with dependent variable $DebtB_{i,j}$. Independent variables are defined in Table 10. Column (1) is the baseline regression. Column (2) restricts the sample to observations where additional control variables are not missing and column (3) adds these controls. In column (4), the sample only consists of profitable acquiring companies and in column (5) an interaction term between $\phi\tau_{acq}^C$ and LCF_i is used to identify a difference in the tax effect for loss making and profitable firms. All specifications include acquirer-country-, year- and industry-fixed effects. Standard errors are clustered on the acquirer-country-year level. P-values are shown in parentheses. * denotes significance at the 10 %-level, ** at the 5 %-level and *** at the 1 %-level.

Table 14: Multinational tax planning for $DebtB_{i,j}$

	(1)	(2)	(3)
$\phi\tau_{acq}^C$	8.0815 (0.174)	7.9621 (0.187)	
<i>Group tax</i>	-0.2852 (0.485)		
$LCF_i * \textit{Group tax}$	-0.1218 (0.863)		
$LCF_j * \textit{Group tax}$	0.3979 (0.458)		
$\phi\tau_{acq}^C - \tau_{tar}^C$		-2.5206 (0.428)	
$\phi\tau_{mean}^C$			6.3379 (0.189)
$\ln Dealvalue_j$	0.4977*** (0.000)	0.4867*** (0.000)	0.5005*** (0.000)
$Size_i$	-0.0910 (0.249)	-0.0601 (0.467)	-0.0777 (0.337)
$Initial\ debt_i$	0.6212 (0.333)	0.3450 (0.578)	0.7027 (0.254)
LCF_i	-0.4728 (0.433)	-0.6073 (0.127)	-0.5494 (0.182)
$Inflation_{acq}$	0.2088 (0.341)	0.2220 (0.325)	0.2429 (0.282)
$Domestic\ credit_{acq}$	0.0357*** (0.001)	0.0396*** (0.000)	0.0338*** (0.002)
$GDP\ growth_{acq}$	0.2657* (0.086)	0.2884* (0.068)	0.2395 (0.114)
$Stock\ market_{acq}$	-0.0184* (0.053)	-0.0213* (0.057)	-0.0197** (0.029)
$Distress_i$	0.1134 (0.496)	0.1382 (0.397)	0.0989 (0.550)
$D\&A_i$	-7.4605 (0.284)	-7.4715 (0.300)	-7.1592 (0.308)
$\Delta D\&A_i$	6.2973 (0.362)	6.0708 (0.351)	6.3728 (0.352)
$Tangibility_i$	1.2968 (0.228)	1.3133 (0.232)	1.2802 (0.251)
$\Delta Tangibility_i$	-3.4893 (0.149)	-3.6370 (0.136)	-3.5567 (0.154)
$Profitability_i$	-1.2463 (0.595)	-1.5674 (0.483)	-1.2953 (0.580)
$\Delta Profitability_i$	-0.3863 (0.824)	-0.6516 (0.712)	-0.3148 (0.857)

to be continued on the next page

Table 14: Multinational tax planning for $DebtB_{i,j}$ (continued)

LCF_j	-0.4736 (0.187)	-0.2773 (0.210)	-0.2240 (0.310)
Observations	692	684	695
Log likelihood	-260.81	-257.37	-262.41
Sensitivity	40.28 %	40.56 %	40.28 %
Specificity	95.99 %	95.93 %	96.19 %
%-pts improved	5.20	5.27	5.32

The table shows logit regressions with dependent variable $DebtB_{i,j}$ based on column (3) of Table 13. Independent variables are defined in Table 10. In Column (1), I control for a potential group tax regime, in Column (2), I test if the financing decision is sensitive to the difference between acquirer and target country tax rates, in Column (3), I test if the weighted average tax rate of the multinational group influences the financing decision. All specifications include acquirer-country-, year- and industry-fixed effects. Standard errors are clustered on the acquirer-country-year level. P-values are shown in parentheses. * denotes significance at the 10%-level, ** at the 5%-level and *** at the 1%-level.

Table 15: Logit analysis using $DebtB_{i,j}$ - sensitivity analysis

	(1) Smaller	(2) Larger	(3) Low debt	(4) > 2 years	(5) Personal	(6) Domestic
$\phi\tau_{acq}^C$	-5.5476 (0.479)	24.5864* (0.060)	6.3608 (0.285)	8.2872 (0.173)	13.3383** (0.036)	17.4298 (0.476)
τ_{acq}^D					7.3953 (0.248)	15.4483 (0.170)
τ_{acq}^I					1.2768 (0.576)	2.3124 (0.502)
$Ln Dealvalue_j$	0.1917 (0.286)	0.6612*** (0.000)	0.5391*** (0.000)	0.5655*** (0.000)	0.5636*** (0.000)	0.4974*** (0.000)
$Size_i$	0.2869* (0.084)	-0.1956 (0.183)	-0.1479 (0.152)	-0.1534* (0.088)	-0.1433 (0.113)	-0.1594 (0.295)
$Initial\ debt_i$	-0.4322 (0.748)	1.2996* (0.064)	0.2482 (0.734)	0.3747 (0.527)	0.4538 (0.450)	1.0794 (0.271)
$Inflation_{acq}$	-0.1177 (0.632)	0.1405 (0.407)	-0.1528 (0.461)	-0.0118 (0.938)	-0.0557 (0.706)	0.5991 (0.311)
$Domestic\ credit_{acq}$	0.0048 (0.833)	0.0512*** (0.001)	0.0264*** (0.005)	0.0325*** (0.000)	0.0349*** (0.001)	0.0356* (0.056)
$GDP\ growth_{acq}$	-0.3601 (0.116)	0.1705 (0.516)	-0.1855 (0.249)	0.0588 (0.686)	0.0100 (0.947)	-0.2633 (0.438)
$Stock\ market_{acq}$	-0.0508* (0.082)	-0.0382* (0.058)	-0.0220* (0.064)	-0.0259** (0.011)	-0.0197* (0.069)	-0.0133 (0.494)
$Distress_i$	0.0621 (0.885)	0.1996 (0.287)	-0.0305 (0.894)	0.0091 (0.959)	0.1142 (0.516)	-0.2276 (0.428)
$D\&A_i$	-8.4067 (0.701)	6.5343 (0.459)	-2.2592 (0.757)	2.8066 (0.632)	1.6645 (0.780)	-14.6209 (0.307)
$\Delta D\&A_i$	53.6644** (0.049)	0.1712 (0.985)	-0.0302 (0.997)	3.4569 (0.628)	1.6060 (0.817)	12.5584 (0.249)
$Tangibility_i$	0.6073 (0.760)	-2.2097* (0.074)	-0.0129 (0.988)	-0.3560 (0.680)	0.0952 (0.913)	1.4624 (0.530)
$\Delta Tangibility_i$	-6.4542 (0.140)	-4.3606* (0.081)	-3.8162 (0.129)	-3.9941* (0.071)	-3.2822 (0.118)	0.2769 (0.960)
$Profitability_i$	-3.7509 (0.608)	-4.3489 (0.317)	-2.4465 (0.441)	-2.0924 (0.446)	-3.1387 (0.246)	4.3982 (0.290)
$\Delta Profitability_i$	-14.3953 (0.178)	4.3538 (0.113)	0.0007 (1.000)	1.3988 (0.391)	0.5167 (0.735)	-0.6455 (0.817)
LCF_j	0.1463 (0.725)	-0.0961 (0.781)	-0.0398 (0.884)	-0.1403 (0.556)	-0.1320 (0.572)	0.0057 (0.991)
Observations	298	315	544	616	631	287
Log likelihood	-92.36	-132.62	-214.11	-247.20	-256.36	-102.29
Sensitivity	31.11 %	61.54 %	46.83 %	46.90 %	45.64 %	46.67 %
Specificity	96.84 %	89.10 %	94.02 %	93.42 %	94.61 %	95.15 %
%-pts improved	2.01	13.02	6.25	6.01	6.65	5.93

The table shows logit regressions with dependent variable $DebtB_{i,j}$ based on column (4) in Table 13. Independent variables are defined in Table 10. Columns (1) and (2) split the sample in small and large deals. column (3) restricts the sample to acquirers showing a pre-deal debt to assets ratio smaller than 75 %. In column (4), all acquirer countries with observations in less than 3 years are dropped. Column (5) introduces personal taxation into the analysis and column (6) restricts the sample to acquirers that are independent or do not have a global ultimate owner abroad. All specifications include acquirer-country-, year- and industry-fixed effects. Standard errors are clustered on the acquirer-country-year level. P-values are shown in parentheses. * denotes significance at the 10 %-level, ** at the 5 %-level and *** at the 1 %-level.

Table 16: Logit analysis for $DebtB_{i,j}$ - dichotomous tax variables

	(1)	(2)	(3)
<i>Tax1</i>	11.7085*** (0.005)		
<i>Tax2</i>		-0.6018 (0.494)	
<i>Tax3</i>			0.0703 (0.933)
<i>Ln Dealvalue_j</i>	0.5073*** (0.000)	0.5038*** (0.000)	0.5049*** (0.000)
<i>Size_i</i>	-0.1049 (0.178)	-0.1103 (0.153)	-0.1092 (0.161)
<i>Initial debt_i</i>	0.8452 (0.119)	0.9519* (0.070)	0.8196 (0.126)
<i>LCF_i</i>	2.9552** (0.026)	-0.7068** (0.039)	-0.6179* (0.055)
<i>Inflation_{acq}</i>	-0.0239 (0.868)	0.0101 (0.940)	0.0068 (0.959)
<i>Domestic credit_{acq}</i>	0.0289*** (0.001)	0.0276*** (0.001)	0.0279*** (0.001)
<i>GDP growth_{acq}</i>	0.0695 (0.564)	0.1096 (0.361)	0.1126 (0.351)
<i>Stock market_{acq}</i>	-0.0183** (0.022)	-0.0222*** (0.007)	-0.0222*** (0.008)
<i>Distress_i</i>	0.0196 (0.900)	0.0238 (0.877)	0.0218 (0.888)
<i>D&A_i</i>	-2.1055 (0.730)	-1.5879 (0.791)	-1.3586 (0.815)
$\Delta D\&A_i$	6.9342 (0.304)	7.3258 (0.284)	6.2088 (0.343)
<i>Tangibility_i</i>	0.6589 (0.439)	0.8795 (0.287)	0.7920 (0.338)
$\Delta Tangibility_i$	-3.5671** (0.039)	-3.3761** (0.048)	-3.6640** (0.037)
<i>Profitability_i</i>	-0.6664 (0.719)	-0.6887 (0.715)	-1.2279 (0.515)
$\Delta Profitability_i$	-0.1712 (0.904)	-0.0638 (0.964)	0.0877 (0.950)
<i>LCF_j</i>	-0.2759 (0.174)	-0.2221 (0.268)	-0.2414 (0.224)
Observations	844	844	830
Log likelihood	-319.12	-321.64	-319.95
Sensitivity	39.31 %	36.42 %	36.42 %
Specificity	95.53 %	95.83 %	95.13 %
%-pts improved	4.50	4.15	3.73

The table shows logit regressions with dependent variable $DebtB_{i,j}$ based on column (3) of Table 13. Independent variables are defined in Table 10. Column (1) employs *Tax1*, column (2) uses *Tax2* and column (3) applies *Tax3* instead of $\phi\tau_{acq}^C$. All specifications include acquirer-country-, year- and industry-fixed effects. Standard errors are clustered on the acquirer-country-year level. P-values are shown in parentheses. * denotes significance at the 10%-level, ** at the 5%-level and *** at the 1%-level.

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