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Multiple Taxes and Alternative Forms of FDI: Evidence from Cross-Border Acquisitions*

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Abstract

Exploiting a large panel with an exhaustive coverage of cross-border acquisitions across more than 30 countries over more than a decade, this paper provides a comprehensive view of the effect of taxation on the desire of multinational enterprises to invest abroad. By considering the differences between worldwide and territorial tax systems, direct and indirect forms of taxation, and horizontal and vertical FDI strategies, the results suggest that taxes have a much more nuanced effect on FDI than suggested to date. Specifically, the corporate tax elasticity differs across the dimensions mentioned above. Moreover, sales taxes affect horizontal, but not vertical CBAs.

JEL classification: F15, F21, F23, F33

Keywords: Corporate Taxation; Cross-Border Acquisitions, FDI Strategy; Poisson Regression, Sales Taxes

1 Introduction

There is a broad consensus that taxes affect the decision of multinational enterprises (MNEs) to invest in a given country. Recent empirical work on the linkages between taxes and foreign direct investment (FDI) have addressed issues relating to the use of statutory, effective average, or effective marginal rates in measuring the impact of corporate income taxation and their role in the location decision of firms (as in, among others, Devereux and Griffith, 1998; Devereux *et al.*, 2002; Devereux, 2006; Buettner and Ruf, 2007), the role of bilateral tax treaties and international double taxation (as in Bloningen and Davies, 2004; Huizinga and Voget, 2009; Barrios *et al.*, 2012), the role of non-profit taxes (Desai *et al.*, 2004; Buettner and Wamser, 2009), and the differences of the tax effect between MNEs pursuing a horizontal and vertical FDI strategy (Mutti and Grubert, 2004). In this paper, we extend this research in several ways.

Our main departure point is the recent paper by Barrios *et al.* (2012) which differed from much of the empirical literature on taxes and FDI that usually relied on data from single source country (often the US) to a number of host countries. Rather, in their study, Barrios *et al.* (2012) have established the impact of corporate taxes across a panel covering $N \times N$ countries. Specifically, the sample contained the location choices encapsulated in 909 foreign subsidiaries between 1999 and 2003 and involved 33 countries. Estimation occurred with a conditional logit model. Our coverage of the location choices is considerably more extensive

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as we employ data in excess of 80,000 cross-border acquisitions (CBAs) between 1999 and 2010 across a similar range of countries. With CBAs accounting for as much as 80 per cent of FDI in any given year, the data coverage will give a more comprehensive picture of the location choices of MNEs. As with Barrios *et al.* (2012), we account for the effect of international taxation (i.e. differences in tax regimes, tax credits and withholding taxes) across countries. While the application of a conditional logit model would be untenable given that we have 80,000 CBAs covering in excess of 30 potential location choices resulting in around 2,500,00 observations, we exploit the finding of Guimarães *et al.* (2003) that identical coefficients can be obtained from a suitably parameterised Poisson regression, which aggregates the location choices into a count variable and hence requires a much lower number of observations for estimation.[1] With this broader coverage, our estimated tax elasticities are lower than those reported by Barrios *et al.* (2012).

Our second main contribution is to consider the role of non-profit taxes on the location choices of MNEs. This builds on Desai *et al.* (2004) who argued that, whilst international tax competition has lead to an erosion of the tax rates on corporate income, other taxes levied on such things as sales or wage payments have become relatively more important in influencing the decision to invest abroad. Indeed, for the case of US multinationals, Desai *et al.* (2004) present evidence that the importance of direct taxes has been decreasing while the indirect tax burden has increased. This pattern arises also for the countries in our sample where, from 1999 to 2010, the mean and standard deviation of the statutory rate of corporate taxes have decreased from, respectively, 33.3% to 28.3% and 7.8 to 6. During the same period, the corresponding values for the sales taxes have increased slightly from, respectively, 16.2% to 16.6% and 5.3 to 5.6. It is therefore not surprising that our results reveal a significantly negative sales tax effect on location choices encapsulated in CBAs, with the corresponding elasticity being similar to that of corporate taxes.

Our third contribution relates to estimating the effect of taxes on different forms of FDI. This is important, not just for delineating the tax elasticity across FDI strategies, but also because we would expect some taxes (notably sales taxes) to matter for horizontal and not vertical FDI. Specifically, Desai *et al.* (2004) argue that addressing the direct tax effects on multinational decisions has to account for tax credits and other details of the international tax system (as we have noted above) but indirect taxes do not have credit mechanisms associated with them. This, however, is not strictly true; location choices that are driven by market access considerations will indeed be subject to sales taxes affecting the demand for locally produced goods. Conversely, FDI that fragments the supply chain and involves production destined for export back to the parent (or to another) country can involve exemptions on sales taxes. In other words, this suggests that sales taxes are expected to have a negative effect on horizontal FDI, but have a lower (or even no) impact on vertical FDI. To account for this potential difference, we identify horizontal and vertical FDI strategies from our sample of CBAs. The results show indeed that, across alternative benchmarks for characterising FDI strategies, the negative effect of sales taxes is confined to foreign acquisitions that are driven by horizontal, or market access, driven strategies. The estimated sales tax elasticity on horizontal CBAs is substantially larger than the elasticities associated with corporate taxes. Mutti and Grubert (2004) have also argued that the role of corporate taxes will also differ between horizontal and vertical FDI. Consistent with the theoretical conjecture of Mutti and Grubert (2004), our results indicate that—taking account of international tax considerations—the tax elasticity associated with vertical FDI is slightly higher compared with the tax disincentives associated with horizontal CBAs.

In sum, exploiting a large panel with an almost exhaustive coverage of CBAs across 30 countries over more than a decade, and addressing the details of the international tax system,

[1] As well as Barrios *et al.* (2012), other papers which have employed location choice models of the logit class to address the FDI/tax issue include Devereux and Griffith (1998), Buettner and Ruf (2007) and Buettner and Wamser (2009).

including the effects of indirect taxes such as sales and labour taxes, and characterising alternative motivations for FDI, this paper provides a comprehensive view of the effect of taxes on FDI. The remainder is organised as follows. Section 2 provides a synoptic overview of the literature on which this paper builds. Section 3 outlines the methodology for identifying alternative strategies for foreign acquisitions highlighting the distinction between horizontal and vertical CBAs. Section 4 addresses issues about the relevant tax measure for the MNE accounting for double taxation and withholding taxes which may play a role in FDI. Section 5 presents the econometric framework and discusses the control variables determining a firm's decision to acquire affiliates in foreign countries. Section 6 reports the results. Section 7 summarises and concludes.

2 Related Literature

This paper is connected with the following aspects of the literature on cross-border acquisitions and FDI, the definition of FDI strategies, and the linkages between taxes and FDI.

2.1 Cross-Border Acquisitions and FDI

Discussion of the effects of taxes on FDI usually relies on data relating to FDI flows or stocks or sales from multinational affiliates. Given data limitations, this has often inhibited a comprehensive coverage of the effects across a large number of countries over a reasonably long period of time. In this paper, we use data on cross-border acquisitions (CBAs) which presents two advantages. First, CBAs are typically the dominant form via which FDI occurs (Di Giovanni, 2005); second, CBA data are now available across a large number of countries and years. Reflecting this, a growing literature uses CBA data to address FDI questions. Examples include the role of investor protection and accounting rules (Rossi and Volpin, 2004), valuation effects in financial markets (Di Giovanni, 2005; Erel *et al.*, 2012), trade cost (Hijzen *et al.*, 2008), or the effect of the European integration (Coerdacier *et al.*, 2009). Conversely, taxes have hitherto only appeared as a control variable in the empirical literature on the distribution and growth of CBAs without addressing the various tax considerations discussed above. The only exceptions are Huizinga and Voget (2009) who, for a sample of European countries, have related taxes with the headquarter decisions when firms merge across national borders as well as Huizinga *et al.* (2012) who have found that international taxation affects the takeover premiums of CBAs.

2.2 FDI Strategies

As we have noted above, some differences in the effect of taxes relate to the distinction between horizontal and vertical strategies of multinational integration. MNEs pursuing a horizontal strategy seek to access markets by replicating production facilities overseas whilst a vertical strategy encapsulates the desire to fragment the production process. Markusen (2002) provides a comprehensive account of this. Since vertical FDI is endowment seeking, it involves the fragmentation of the supply chain with the production abroad leading to the export of intermediate goods. Conversely, horizontal FDI is market seeking and will substitute for exports from the source country. Reflecting the different motives, horizontal and vertical FDI should emerge, respectively, between developed and developing countries. However, some doubt concerning the dominance of horizontal FDI between developed countries has been raised by Alfaro and Charlton (2009). Their main contribution is to directly measure the vertical relatedness between affiliate activity and the parent company. They show that a substantial part of FDI between developed countries is actually vertical in nature with a large proportion of this being intra-industry (e.g. within broad industry aggregates). To question the assumption that FDI flows between developed countries are principally horizontal in nature, the crucial aspect is the identification of vertical relatedness from the value flows within supply chains as reported in input:output tables. In the determination

of the acquisition strategies outlined in Section 3, our methodology is similar to Alfaro and Charlton (2009).

2.3 Taxes and FDI

There is a substantial body of research measuring the responsiveness of FDI to corporate taxes. Early studies drew on statutory rates. Though the corresponding data are readily available for a large number of countries, the rates stipulated in the tax code are not necessarily appropriate when it comes to overseas location choices. To better capture the long term implications of FDI projects, the effective average tax rate (EATR) measures the net present value of tax payments as a proportion of the net present value of pre-tax capital income taking into account the capital depreciation and tax allowances (see Devereux and Griffith, 1998; Devereux *et al.*, 2002; Buettner and Ruf, 2007). Related to the EATR is the effective marginal tax rate (EMTR) which measures the proportionate difference in post- and pre-tax rates of return. This should matter more for incremental investments in foreign firms rather than the location choices that occur when taking over control by means of a CBA. The burden of corporate taxation will also depend on the tax system applied with respect to credits on taxes paid abroad, the treatment of repatriated profits, or the withholding taxes imposed in the host country. An early study considering such international tax issues is Blonigen and Davis (2004), who found little evidence that the existence of a bilateral tax treaty had an effect on US inbound and outbound FDI. Within the context of CBAs, Huizinga and Voget (2009) provide a more comprehensive view in terms of compiling data reflecting the contents of specific tax treaties. They found that differences between countries applying a worldwide (or credit based) and a territorial (or exemption based) tax system and the role of withholding tax rates agreed in tax treaties impact upon the parent firm location in a given country. Without focusing on CBAs, but using a similar approach to Huizinga and Voget (2009), Barrios *et al.* (2012) suggest that source and host country taxes affect the location decision of establishing foreign subsidiaries. The methodology we apply relates also to the discrete location choices of MNEs but, as discussed in Section 5, our econometric approach can cope with the massive number of such decisions embodied in CBA deals around the world.

While the literature on FDI has primarily considered the role of corporate taxes, according to Desai *et al.* (2004) and Buettner and Wamser (2009), other (indirect) taxes may also matter. However, as far as we are aware, the effect of for example sales and labour taxes on CBAs has not yet been established. Desai *et al.* (2004) argue that, while the international tax system deals with the role of credits to avoid double corporate taxation, indirect taxes have no credit system that applies. This, however, is only partially true when it comes to sales taxes: for FDI that is motivated by market access (horizontal FDI), it is indeed the case that sales taxes will apply and cannot be credited. However, it is well known that FDI can also be motivated by vertical factors, which involve the international fragmentation of supply chains and foreign subsidiaries producing intermediate goods that are usually exported back to the parent country (or some other country). Sales taxes can usually be refunded at the border. The effect of sales taxes on exports has been addressed empirically by Keen and Syed (2006) who show that the value added tax (VAT) to be trade neutral while Desai and Hines (2005) find the VAT to have a negative effect on net exports though they put this down to inefficiencies in the VAT rebate system across the panel of countries they cover.

Mutti and Grubert (2004) argue that the effect of direct corporate taxes might also depend on the underlying strategy. In particular, they conjecture that corporate taxes will have no effect on horizontal FDI, since the corresponding affiliates will be on the same footing as domestic firms in the host country. Conversely, high taxes on vertical FDI will place a subsidiary at a disadvantage, since it will be competing with firms in the source country that have not invested abroad. The effect of taxes may therefore depend on the motivation for FDI.

In sum, establishing the exact effect of corporate and sales taxes on CBAs necessitates a method to identify FDI strategies and a careful consideration of international tax issues. Therefore, before outlining the econometric methodology, we detail how we distinguish between horizontal and vertical CBAs and discuss the key aspects of international taxation.

3 Horizontal and Vertical CBAs

Driven by the availability of detailed tax data, we focus on international acquisitions between the 32 source and 31 host countries listed in the data appendix. During the 1999 to 2010 period, according to SDC Platinum of Thomson Reuters, these countries witnessed 82,182 deals and accounted for more than 90 per cent of the total number CBAs around the world. SDC Platinum has been used elsewhere for empirical research on CBAs. Early studies such as Rossi and Volpin (2004) as well as Di Giovanni (2005) relied on the aggregate value of the reported deals between pairs of source and host countries. The caveat against this is that in the majority of cases, the deal value has not been disclosed by the merging firms (Di Giovanni, 2005, p.134). To avoid this missing data problem, Herger *et al.* (2008), Hijzen *et al.* (2008), Huizinga and Voget (2009), and Erel *et al.* (2012) rely on the number of deals, which is almost exhaustively available since SDC claims to record virtually any change in ownership of at least 5 per cent. The econometric issues arising with event counts are discussed in Section 5. Of note, the results can differ between event count and value data since they refer, respectively, to the effect of taxes on the location choice of an MNE and the amount to invest once the decision to enter a foreign market has been taken.

To disentangle the impact of taxation across FDI strategies, we face the challenge of identifying CBAs between horizontally and vertically related firms. For each deal, SDC Platinum reports standard industry classification (SIC) codes of the acquirer and foreign target firm at the 4-digit level denoted here by, respectively, SIC_a and SIC_b. This provides the basis to uncover the industrial relationship between the merging firms. In particular, when $SIC_a = SIC_b$, an acquisition involves firms operating in the same industry, which is a typical feature of horizontal integration.

However, when tying down vertical acquisitions, it is not sufficient to observe that the SIC codes of the acquiring and target firms differ; one also needs a direct measure of vertical relatedness that will explicitly identify the links within the supply chain. Therefore, we draw on the methodology of Fan and Lang (2000) and Fan and Goyal (2006), who have derived a measures of vertical relatedness from the input:output structure of commodity flows between around 500 intermediate industries using US accounts. Alfaro and Charlton (2009), Acemoglu *et al.* (2009), and Garfinkel and Hankins (2012) have also used this methodology to analyse differences in investment strategies in the market for corporate control. Specifically, for every pair of industries, SIC_a and SIC_b, the input:output tables allow to calculate the value of sales from SIC_a required to produce a dollar's worth of SIC_b. The higher this measure, called the vertical relatedness coefficient V_{ab}, the greater the degree with which the corresponding industries are linked through the supply chain. By defining a benchmark $\overline{V}$, it is then possible to identify deals between firms operating in industries with $V_{ab} > \overline{V}$ that are deemed to be vertically related. Following Alfaro and Charlton (2009), the 5 per cent benchmark for $\overline{V}$ will be used for the baseline results whilst the 1 and 10 per cent values will be used for robustness checks.

One potential issue in matching SIC codes is that firms often operate in several industries; the SDC database reports up to 6 different SIC codes for both acquiring and target firms. To reflect the prevalence of diversified MNEs, we analyse the horizontal and vertical relatedness between acquirer and target firm across every potential pair of industries in which they operate. In particular, for each CBA, the up to 6 industries of the acquiring firm are indexed with $r \in 1, 2, 3, 4, 5, 6$ and the industries of the target firm with $s \in 1, 2, 3, 4, 5, 6$.

The up to 36 pairs give rise to the following classification as to whether CBAs involve firms that are horizontally, that is $SIC_a^r = SIC_b^s$, or vertically, that is $V_{ab}^{rs} > \overline{V}$, related:

(i.) 'Pure horizontal' acquisitions between acquiring and target firms sharing at least one combination of 4-digit SIC codes, but are vertically unrelated in any of the 36 possible combinations of SIC_a^r and SIC_b^s; and

(ii.) 'Pure vertical' acquisitions between acquiring and target firms related in at least one combination of industries through the supply chain, but have no common industry codes for across the (up to) 36 combinations of SIC_a^r and SIC_b^s codes.

Table 1 formalises the definition of the alternative strategies of FDI/CBAs.[2]

Table 1: Definition of Horizontal and Vertical Cross-Border Acquisitions (CBAs)

FDI Strategy	**Horizontal Relatedness**	**Vertical Relatedness**
Pure Horizontal	$\exists r, s$ such that $\text{SIC}_a^r = \text{SIC}_b^s$	$V_{ab}^{rs} < \overline{V} \quad \forall \quad r, s$
Pure Vertical	$\text{SIC}_a^r \neq \text{SIC}_b^s \quad \forall \quad r, s$	$\exists$ r,s such that $V_{ab}^{rs} > \overline{V}$

The distribution of the 82,182 CBAs between 1999 and 2010 among our sample of source and host countries is reported in Table 2. The second column shows the breakdown of all deals across the top 5 source and host countries. Note that the same developed countries, that is the US, the UK, Canada, Germany, and France, are the most important source and host nations for CBA and that they alone account already for more than half of all deals.

Table 2: Number of Cross-Border Acquisitions (1999 - 2010)

	All Deals	Horizontal ($\overline{V}$=5%)	Vertical ($\overline{V}$=5%)
	Top 5 Source Countries		
United States	20,064	3,113	6,130
United Kingdom	10,892	2,275	2,916
Canada	7,248	1,226	2,514
Germany	5,927	1,089	1,811
France	5,698	1,507	1,608
	..	...	...
Total	82,182	15,671	24,250
	Top 5 Host Countries		
United States	16,440	3,159	5,136
United Kingdom	9,320	1,832	2,864
Germany	7,159	1,293	2,107
Canada	5,815	970	1,657
France	4,921	931	1,387
	..	...	...
Total	82,182	15,671	24,250

Using the methodology of Table 1, the alternative investment strategies characterising these CBAs are reported in the remaining columns of Table 2. Of the total number of acquisitions,

[2]In a some cases, the classification produces less clear outcomes. For example, acquisitions involving firms in the same SIC also pass the measure of vertical relatedness. This would be compatible with complex strategies combining several motives for FDI as discussed e.g. in Yeaple (2003). However, to avoid ambiguities, and produce a close concurrence with the established theories on FDI strategies, the analysis will focus on acquisitions that are 'purely' horizontal or vertical according to the definition of Table 1.

around 50 per cent of all deals are classified as purely horizontal or vertical. Using the 5 per cent benchmark for $\overline{V}$, 19 per cent are classified as 'pure' horizontal and 37 per cent as 'pure' vertical. Substantial shifts in the distribution of FDI strategies arise when alternative benchmarks are used for $\overline{V}$. Specifically, with the 10 per cent benchmark employed (which raises the threshold of vertical relatedness defining that industries are connected through the supply chain), around 29 per cent are classified as 'pure' horizontal and 11 percent as 'pure' vertical acquisitions. Conversely, with the 1 per cent benchmark employed (which lowers the threshold for defining vertical integration), vertical deals dominate with 57 per cent whilst only 8 per cent of all CBAs would be deemed to be horizontal. Hence, a shift between the conventionally used benchmark values $\overline{V}$ has a substantial effect on the empirical distribution between horizontal and vertical strategies meaning that it will be important to make this distinction when establishing the effect of taxes on CBAs below.

4 International Taxation

Aside from the distinction between statutory and effective tax rates discussed in Section 2, Huizinga and Voget (2009) and Barrios *et al.* (2012) have drawn attention to the role of double taxation and international tax relief in FDI. They suggest that the host country rate τ_{jt} is an incomplete measure of the tax burden on the MNE since the same profit can, in principle, also be taxed in the source country i at the rate τ_{it}. Furthermore, host countries often impose a withholding tax of ω_{ijt} when MNEs repatriate the after-tax profits $(1-\tau_{jt})$ to the source country i. Hence, the consolidated tax burden from FDI between source country i into host country j during year t can be up to

$$\tau_{ijt} = \tau_{jt} + \tau_{it} + (1 - \tau_{jt})\omega_{ijt}. \tag{1}$$

However, since most FDI is subject to some double tax relief, the rate of (1) is rarely applied in practice. The amount of double tax relief depends on (i.) the international tax system, that is whether the source country applies a territorial or worldwide regime where international tax relief occurs, respectively, through exemptions and tax credits and (ii.) whether the source and host country have signed a bilateral tax treaty stipulating the tax system that applies between them or the maximum amount of withholding taxes. In countries with a territorial tax system, foreign profits are exempted from domestic taxation implying that $\tau_{it} = 0$. The international tax burden on the MNE is then

$$\tau^{e}_{ijt} = \tau_{jt} + (1 - \tau_{jt})\omega_{ijt}. \tag{2}$$

Conversely, in countries with a worldwide system, domestic corporate taxes must be paid even if the profits have been earned abroad but, to reduce the double tax burden, firms can earn credits on foreign tax payments.[3] The international tax burden on the MNE is then $\tau_{ijt} = \tau_{it} + \tau_{jt} + (1 - \tau_{jt})\omega_{ijt} - c_{ijt}$ where c_{ijt} denotes the tax credits. With an indirect tax credit system, corporate and withholding taxes are both creditable, that is $c^{i}_{ijt} = \tau_{jt} + (1 - \tau_{jt})\omega_{ijt}$ whereas direct tax credits apply only to withholding taxes meaning $c^{d}_{ijt} = (1 - \tau_{jt})\omega_{ijt}$. Since the tax credit is restricted to the tax burden that would accrue to the same profit in the parent country, we have that $c^{i}_{ijt} = \min[\tau_{it}, \tau_{jt} + (1 - \tau_{jt})\omega_{ijt}]$ and $c^{d}_{ijt} = \min[\tau_{it}, \omega_{ijt}]$ (Huizinga and Voget, 2009, p.1223). In sum, the international tax burden equals

$$\tau^{i}_{ijt} = \begin{cases} \tau_{j,t} + (1 - \tau_{jt})\omega_{ijt}, & \text{if } \tau_{jt} + (1 - \tau_{jt})\omega_{ijt} > \tau_{it}; \\ \tau_{it}, & \text{if } \tau_{jt} + (1 - \tau_{jt})\omega_{ijt} < \tau_{it} \end{cases} \tag{3}$$

for the indirect tax credit system and

[3] During the period under consideration, a number of countries have switched from a credit based towards an exemption based system. Examples include the Czech Republic (2004), Norway (2004), Poland (2007), Japan (2009), and the United Kingdom (2009) with the year of the transition reported in parentheses.

$$\tau_{ijt}^{d} = \begin{cases} \tau_{jt} + (1 - \tau_{jt}^{d})\omega_{ijt}, & \text{if } \omega_{ijt} > \tau_{it}; \\ \tau_{jt} + (1 + \omega_{ijt})\tau_{i,t}, & \text{if } \omega_{ijt} < \tau_{it} \end{cases} \tag{4}$$

for the direct tax credit system (see also Barrios *et al.*, 2012, pp. 949ff.).[4]

One issue in dealing with international double taxation is the potential to defer the repatriation of profits and, hence, postpone the payment of corporate taxes in the home country. In practice, it is difficult to establish whether a firm has an incentive to keep unrepatriated profits in an acquired subsidiary abroad (see Huizinga and Voget, 2009, pp.1230ff.). Furthermore, most countries impose complex rules and regulations as regards the repatriation of foreign profits. Hence, one merit of distinguishing between the effect of host country taxes τ_{jt} and the international tax burden τ_{ijt} is that this might shed light into the importance of deferral (Barrios *et al.*, 2012, p.951). In particular, a lower impact of τ_{ijt} compared with τ_{jt} could suggest that the repatriation of profits is often deferred to a degree where issues of double taxation are of minor concern. A possible difference with the host country tax effect can arise from both the withholding tax ω_{ijt} or the additional corporate taxes that can accrue, in particular, in parent countries with a worldwide tax system. In sum, we will use the host country tax τ_{jt}, measured with the statutory or effective rates, as baseline variables as well as (2) to (4) to infer the effect of international double taxation on CBAs.

For a set of European countries, Huizinga and Voget (2009) and Barrios *et al.* (2012) provide detailed information about the tax system as well as the withholding tax rates that apply according to bilateral tax treaties. To calculate the international tax burden, we have compiled some new data that also cover major countries outside Europe that appear in our common sample including Argentina, Australia, Brazil, Canada, Hongkong, Indonesia, Japan, Mexico, Singapore, the US, and South Africa.[5] To concur with Huizinga and Voget (2009) and Barrios *et al.* (2012), profits are assumed to be repatriated in form of dividends.

As mentioned above, non-profit taxes might also matter for the location choice of firms. To account for this, we follow the literature (Desai *et al.*, 2004; Buettner and Wamser, 2009) and include the rates of value-added and other sales taxes in the host country. Furthermore, labour taxes and the amount of compulsory social security contributions to be paid in each country might be relevant when the desire to outsource labour intensive production stages to low wage countries provides the motive for acquiring a foreign firm. Following Braconier *et al.* (2005), labour tax data have been extracted from the Prices and Earnings survey of UBS (various years).[6]

5 Econometric Strategy

Since CBAs are by far the most common form of FDI[7], deals—that are henceforth indexed with d—between acquirer and target firms offer a comprehensive source to study the effect of taxation upon the propensity of MNEs to locate economic activities in a given country. The desire to acquire a foreign subsidiary rests on the opportunity to generate an income stream of R and, thus, earn an expected profit of

$$\pi_{ijt}^{d} = (1 - \tau_{ijt})R(x_{ijt}, \tau_{jt}^{o}, \delta_i, \delta_j, \delta_t) \tag{5}$$

[4]Before changing to an exemption based system in 2004, the Czech Republic used a deduction based system where foreign taxes can be subtracted from the domestic taxable profits. According to Barrios *et al.* (2012), the international tax rate is then equal to $1 - (1 - t_{it})(1 - \tau_{jt})(1 - \omega_{ijt})$.

[5]The sources to compile this information were the Corporate and Indirect Tax Survey of KPMG (various years), the Deloitte International Tax Source (DITS), the country-specific lists of double taxation treaties of UNCTAD, as well as information published by the relevant national tax authorities.

[6]Buettner and Wamser (2009) also consider the role of import duties and excises for which they find no effect on the location choice of German multinationals. Since the trade freedom variable, discussed in Section 5, already contains a component measuring the tariff barrier in each country, we have not included a separate variable for import duties and excises.

[7]For a detailed account on the empirical nexus between FDI and CBAs see Di Giovanni (2005).

whose value depends, in turn, on several factors.[8] In particular, as discussed above, firms are thought to be reluctant to invest in the face of high tax rates τ_{ijt} levied directly on corporate income, but also other forms of taxation τ^o_{jt} accruing e.g. to the value-added component of R. The control variables are summarised in x_{ijt}. Year specific components δ_t absorb global developments within the international market for corporate control that sustain the observed wave-like pattern in international merger activity (see Di Giovanni, 2005). Finally, δ_i and δ_j absorb all factors that are specific to, respectively, the source and host countries.

Our sample with CBAs will be used to estimate the degree with which taxation affects the profit opportunities of (5) and, in turn, the desire to locate economic activities abroad. Profit opportunities are thought to differ systematically between alternative source countries i, host countries j, and years t. Log-linearising (5) yields the regression equation

$$\pi^d_{ijt} = \widetilde{x}_{jt}\beta + \widetilde{\tau}_{ijt}\gamma + \delta_i + \delta_j + \delta_t + \epsilon_{ijt} \quad \text{with} \quad i = 1, \ldots, I; j = 1, \ldots, J; t = 1, \ldots, T, \quad (6)$$

whereby $\widetilde{x}_{ijt} = \ln(x_{ijt})$ as well as $\widetilde{\tau}_{ijt} = \ln(\tau_{ijt})$ collect the control and tax-related variables, β and γ are coefficients to be estimated, and ϵ_{ijt} is a deal-specific error term.

To isolate the impact of taxes, the set of control variables $\widetilde{x}_{ijt}$ accounts for the established factors to explain FDI. In particular, real GDP in the host country reflects the market access motive of FDI. The expected sign is positive since it is more likely that a MNE acquires a target in a larger economy. Higher wage costs are expected to have a negative effect on the decision to locate in any specific country. Owing to the separate inclusion of labour taxes, a measure for wages net of payroll taxes and compulsory social security contributions is used. Even when wages are low, MNEs might be reluctant to enter foreign markets with rigid labour market regulations. This is proxied by an index on labour market freedom. The distance between the source and host countries as well as whether they share a common border account for the effect of geography on FDI. Trade freedom is an index that captures the absence of tariff and non-tariff barriers to trade in the host country. For the MNE, this will matter when intermediate goods provide inputs for foreign subsidiaries or given that exports (subject to trade costs) can be used as an alternative strategy to establishing a local plant when serving a foreign market. Other factors which influence the openness of the country to FDI are given by investment freedom, an index measuring whether the government treats foreign firms in the same way as domestic investors, whether specific industries are closed to investment, whether governments impose restrictions on capital transactions and transfers—the expected effect of this variable is positive. An index on shareholder rights controls for the role of corporate governance, emphasised in Rossi and Volpin (2004), when acquiring a foreign firm. During the period under consideration, a number of countries joined the European Union or adopted the Euro as a common currency. Following Coeurdacier *et al.* (2009), this will be reflected by two sets of dummy variables reflecting, respectively, whether source and host country or only the host country are a member of the European Union or the Euro. Finally, exchange rates are also a likely determinant of FDI. Following Froot and Stein (1991) and Blonigen (1997), a (real) appreciation of the currency of the host country is expected to have a negative effect since this makes a foreign acquisition more expensive when expressed in the home currency. Detailed definitions and data sources for each of the variables are reported in the data appendix.

Equation (6) forms the basis for our empirical strategy. However, expected profits π_{ijt} are not directly observable. Therefore, we follow a growing literature (e.g. Devereux and Griffith, 1998; Buettner and Ruf, 2007; Buettner and Wamser, 2009; Barrios *et al.*, 2012) exploiting the fact that observed CBA deals encapsulate a location choice that identifies the country with the highest expected profit opportunity, that is

$$h^d_{ijt} = \begin{cases} 1 & \pi^d_{ijt} > \pi^d_{ij't} \quad \forall \quad j' \neq j \\ 0 & \text{otherwise,} \end{cases} \quad (7)$$

[8] See Devereux and Griffith (1998) for a similar specifications to modeling the profits of MNEs.

where j' denotes alternative hosts where a firm could, in principle, also have made an acquisition. Based on the discrete decision h^d_{ijt}, taxes that matter for the MNE can be connected with the empirically observed market entry (or location) choice. Econometric models that are capable to handle such choices include the conditional logit model, where h^d_{ijt} is the dependent variable. This has been used by Barrios *et al.* (2012) to estimate the effect of international taxes on the MNEs location choice for a sample of European countries. Conditional logit models exploit the fact that a MNE wants to invest in the host country offering the highest expected profit opportunity, by assuming that the stochastic component ϵ_{ijt} of (6) is type I extreme value distributed. This implies that the probability that a firm of source country i acquires a target in country j during year t is given by

$$P^d_{ijt} = P_{ijt} = \frac{\exp(\widetilde{x}_{ijt}\beta + \widetilde{\tau}_{ijt}\gamma + \delta_j)}{\sum_{i=1}^{I}\sum_{j=1}^{J}\sum_{t=1}^{T}\exp\left(\widetilde{x}_{ijt}\beta + \widetilde{\tau}_{ijt}\gamma + \delta_j\right)}. \tag{8}$$

Owing to the exponential nature of (8), the components δ_i and δ_t pertaining, respectively, to source countries and years drop out. Thus, only variables such as taxes that differ across the alternatives, that is the host countries j, affect the location choice embodied in each CBA deal. The joint distribution over all deals d, source countries i, host countries j, and the 11 years t under consideration enter the log likelihood function $\ln L_{cl} = \sum_{d=1}^{D}\sum_{i=1}^{N}\sum_{j=1}^{J}\sum_{t=1}^{T}\ln(P^d_{ijt})$. Since $P^d_{ijt} = P_{ijt}$, the number n_{ijt} of CBAs can be factored out, that is $L_{cl} = \sum_{i=1}^{I}\sum_{j=1}^{J}\sum_{t=1}^{T} n_{ijt}P_{ijt}$. Inserting (8) yields

$$\begin{aligned}\ln L_{cl} \;=\; & \sum_{i=1}^{I}\sum_{j=1}^{J}\sum_{t=1}^{T} n_{ijt}(\widetilde{x}_{ijt}\beta + \widetilde{\tau}_{ijt}\gamma + \delta_j) \\ & - \sum_{i=1}^{I}\sum_{j=1}^{J}\sum_{t=1}^{T}\left[n_{ijt}\ln\left(\sum_{i=1}^{I}\sum_{j=1}^{J}\sum_{t=1}^{T}\exp(\widetilde{x}_{ijt}\beta + \widetilde{\tau}_{ijt}\gamma + \delta_j)\right)\right],\end{aligned} \tag{9}$$

from which the coefficients β and γ can be estimated. In practice, a caveat against the conditional logit model is that it can require massive amounts of data for estimation. Our sample with 82,182 CBA deals and 31 potential host countries would have necessitated the compilation of a dataset with around 2,500,000 observations ($D \times H$).

To avoid this caveat, Guimarães *et al.* (2003) have proposed to turn to the Poisson regression for the coefficient estimation in location choice models. This assumes that n_{ijt} is Poisson distributed, that is

$$Prob[n = n_{ijt}] = \frac{\exp(-\lambda_{ijt})\lambda_{jt}^{n_{ijt}}}{n_{ijt}!}, \tag{10}$$

whilst an exponential mean transformation connects the Poisson parameter λ_{ijt} with the explanatory variables of (6), that is

$$E[n_{ijt}] = \lambda_{ijt} = \exp(\widetilde{x}_{ijt}\beta + \widetilde{\tau}_{ijt}\gamma + \delta_i + \delta_j + \delta_t) = \alpha_{it}\exp(\widetilde{x}_{jt}\beta + \widetilde{\tau}_{ijt}\gamma + \delta_j). \tag{11}$$

For our case with panel data, $\alpha_{it} = \exp(\delta_i + \delta_t)$ absorbs the heterogeneity from different source countries and years and is here treated as fixed effect. Guimarães *et al.* (2003) have shown that the concentrated log-likelihood function, which no longer depends on α_{it}, equals

$$\begin{aligned}\ln L_{pc} \;=\; & \sum_{i=1}^{I}\sum_{j=1}^{J}\sum_{t=1}^{T} n_{ijt}(\widetilde{x}_{ijt}\beta + \widetilde{\tau}_{ijt}\gamma + \delta_j) \\ & - \sum_{i=1}^{I}\sum_{j=1}^{J}\sum_{t=1}^{T}\left[n_{ijt}\ln\left(\sum_{i=1}^{I}\sum_{j=1}^{J}\sum_{t=1}^{T}\exp(\widetilde{x}_{ijt}\beta + \widetilde{\tau}_{ijt}\gamma + \delta_j)\right)\right] + C.\end{aligned} \tag{12}$$

Since (12) differs from (9) only as regards the constant C, the estimates of β and γ of a Poisson regression and a conditional logit model are identical![9] Note that the overlap between these models is contingent on a fixed effect α_{it} pertaining to source countries and years leaving the heterogeneity across locations, e.g. alternative host countries, for coefficient estimation. Owing to the nonlinearities in Poisson regressions, a different specification of the fixed effect would yield a different log-likelihood function with different coefficient estimates. In sum, the main advantage of employing the Poisson regression is the dramatic reduction in the number of observations required for coefficient estimation.

As long as the variables are transformed into logarithms, the coefficients (β and γ) of the Poisson regression have the interpretation of an elasticity with respect to the expected number of acquisitions $E[n_{ijt}]$. Hence, the (direct) tax elasticity η, given by

$$\eta = \frac{\partial E[n_{ijt}]}{\partial \tau_{ijt}} \frac{\tau_{ijt}}{E[n_{ijt}]} = \gamma, \tag{13}$$

is constant.[10]

6 Results

6.1 Baseline Results

Table 3 reports the results connecting the econometric approaches that are based on the location choice revealed from CBA deals with the empirical literature on FDI and taxes. Ignoring for the moment the role of international tax considerations, columns 1 and 2 employ statutory rates, columns 3 and 4 effective average rates, and columns 5 and 6 effective marginal rates to measure τ_{jt}. Columns 2, 4, and 6 consider this with the inclusion of other taxes levied on sales and wage payments. The results refer to the number of CBAs during the 1999 to 2010 period with 82,182 observed deals between 32 source and 31 host countries for which detailed tax data were available (see data appendix). The sample involves an unbalanced panel with 11,248 observations covering 379 pairs of source countries and years. As shown in Section 5, the coefficient estimates that resulted from a fixed effects Poisson regression are identical with those of a conditional logit model for the location choice of host countries j.

Inspection of the results relating to the control variables across the six specifications of Table 3 reveals that the coefficients concur with the theoretical priors. In particular, economic size, a cheap foreign currency, the proximity between countries, institutional quality (in terms of investment and labour market freedom and the proliferation of shareholder rights), and joint membership of the Euro Zone significantly enhance a country's capacity to attract CBAs. EU membership and trade freedom have an insignificant effect, which might reflect that the trade barriers within our sample with mainly developed host countries are already relatively low. The effect of wage cost is also insignificant. Again, within the current sample with mainly developed countries, the desire to outsource labour intensive production processes to low wage countries is apparently not a key factor driving international acquisitions. Note, however, that the variable that measures labour market flexibility is significant at the 1 per cent level.

[9] The standard deviations of the Poisson regression and the conditional logit model are asymptotically identical as long as a clustering at the group level α_{it} is applied (Schmidheiny and Brülhart, 2011, p.219).

[10] Even though the coefficient estimates are identical, Schmidheiny and Brülhart (2011) observe that the elasticities differ between the Poisson regression and the conditional logit model. See also Herger and McCorriston (2013). In particular, the tax elasticity of the conditional logit model, which is $\eta^{cl}_{ijt} = (1-P_{ijt})\gamma$, cannot be larger than (13). In other words, the Poisson regression sets an upper bound for the tax elasticity. As long as P_{ijt} is small, which tends to be the case in a samples comprising a large number of countries and years, the difference between the elasticity of a Poisson regression and a conditional logit model will be small.

Table 3: Results for Statutory and Effective Tax Rates

Corporate Tax:	Statutory Rate		EATR		EMTR	
	(1)	(2)	(3)	(4)	(5)	(6)
GDP	0.48***	0.46***	0.42***	0.41***	0.39***	0.37***
	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
Net Wage	0.01	0.01	0.01	0.01	0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Distance	-0.62***	-0.62***	-0.62***	-0.62***	-0.62***	-0.62***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Border	0.47***	0.47***	0.47***	0.47***	0.47***	0.47***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Investment Freedom	0.20***	0.17***	0.19***	0.17***	0.19***	0.16***
	(0.04)	(0.05)	(0.04)	(0.04)	(0.05)	(0.04)
Trade Freedom	-0.04	-0.03	-0.05	-0.04	-0.05	-0.05
	(0.07)	(0.08)	(0.07)	(0.08)	(0.07)	(0.07)
Labour Market Freedom	0.01***	0.01***	0.01***	0.01***	0.01***	0.01**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Shareholder Rights	1.49***	1.45***	1.45***	1.42***	1.37***	1.34***
	(0.15)	(0.14)	(0.16)	(0.13)	(0.15)	(0.16)
EU_{it}*EU_{jt}	-0.51	-0.50	-0.51	-0.50	-0.50	-0.49
	(0.57)	(0.57)	(0.57)	(0.57)	(0.57)	(0.57)
(1-EU_{it})*EU_{jt}	-0.01	0.001	-0.01	0.002	0.005	0.02
	(0.57)	(0.57)	(0.57)	(0.57)	(0.57)	(0.57)
$Euro_{it}$*$Euro_{jt}$	0.27***	0.26***	0.26***	0.26***	0.26***	0.26***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
(1-$Euro_{it}$)*$Euro_{jt}$	-0.38***	-0.38***	-0.38***	-0.39***	-0.39***	-0.39***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Exchange Rate	-0.54***	-0.54***	-0.56***	-0.56***	-0.58***	-0.58***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Corporate Tax (τ_{jt})	-0.20***	-0.22***	-0.16***	-0.16***	-0.03	-0.05
(Host Country)	(0.06)	(0.06)	(0.06)	(0.06)	(0.03)	(0.03)
Sales Tax		-0.20***		-0.16**		-0.15***
		(0.07)		(0.07)		(0.07)
Labour Tax		0.06		0.07		0.07
		(0.05)		(0.05)		(0.05)
#cba	82,182	82,182	82,182	82,182	82,182	82,182
#obs	11,248	11,248	11,248	11,248	11,248	11,248
$\ln L$	-26,078	-26,074	-26,081	-26,078	-26,084	-26,081

Notes: The dependent variable is the number n_{ijt} of CBA deals between source country i and host country j during year t. Estimation is by maximum likelihood of a Poisson regression with fixed effects α_{it}. Aside from the dummy variables (Border, EU, Euro), the explanatory variables have been transformed into logarithms such that the coefficients reflect constant elasticities. All specification include host country dummy variables δ_j. For the 1999 to 2010 period, the data cover all CBAs between the 32 source and 31 host countries listed in the data appendix. Furthermore, #cba is the total number of deals, #obs is the number of observations, and $\ln L$ the maximised value of the log likelihood function of the Poisson regression. Standard errors, clustered by α_{it}, are reported in parentheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

With respect to taxation, as noted above, there is broad evidence that corporate taxes reduce a country's capacity to attract FDI. This is confirmed by the results of Table 3, where corporate taxes τ_{jt}, measured by statutory and effective average rates in columns 1 to 4, have a negative and significant effect on CBA activity. Conversely, with the EMTR, an insignificant coefficient arises in columns 5 and 6. As noted above, this is perhaps not surprising since effective marginal tax rates should matter for incremental investments affecting the value of FDI rather than the discrete location choices associated with the number of CBAs.[11] Compared with the vast literature on the effect of taxes on FDI, the value of our elasticities is relatively low. Finally, other dimensions of taxation matter for international investment decisions. For the sample covering all CBAs, relatively high sales taxes reduce the probability that a foreign country attracts an acquisition. This coincides with the findings of Desai *et al.* (2004) about the effect of indirect taxes on the affiliate sales of US multinationals, but differs from Buettner and Wamser (2009), who found that sales taxes had no significant effect on the location choice by German multinationals after including country-specific dummy variables. However, our fixed effects estimates are derived from an $N \times N$ country panel, which apparently offers more scope to identify tax effects. Conversely, similar to Buettner and Wamser (2009), taxes levied on wage payments have no significant effect on the location choices inferred from CBA deals.

6.2 International Tax Considerations

Table 4 extends the analysis of the impact of taxes upon CBAs by accounting for international tax considerations. As discussed in Section 4, MNEs can be subject to a double tax burden. Specifically, columns 1 and 2 of Table 4 consider the effect the international corporate tax burden τ_{ijt} that depends, according to equations (2) to (4), on such things as the international tax system, the double tax relief stipulated in bilateral tax treaties, or the withholding tax rate ω_{ijt} when repatriating profits from host country j to parent country i. Similar to the results above, international corporate taxes impact negatively upon the number of CBAs regardless whether they are measured on the basis of statutory or effective average rates in, respectively, column 1 and 2.[12] Recall that the international tax burden applies only when profits are repatriated, which is notoriously difficulty to verify. Hence, the differences between the results of Tables 3 and 4 could provide some indirect evidence on the relevance of deferring the repatriation of profits in order to reduce the tax burden. In this regard, for CBAs, there is no evidence that the deferral reduces the importance of the (international) tax burden on corporate profits. Rather, with coefficients of around -0.4, the impact of the international tax burden τ_{ijt} is more than double the corresponding value of the host country tax τ_{jt} used in Table 3.[13] Barrios *et al.* (2012, p.953) found an even larger elasticity of around -0.8 on the international corporate tax burden. However, their sample covered only 909 new foreign subsidiaries within European countries whilst our data cover more than 80,000 CBAs from countries around the world.

Following Barrios *et al.* (2012), the remaining columns of Table 4 split the international corporate tax burden τ_{ijt} into its individual components. Distinguishing again between

[11] We have also experimented with some regressions using the deal value of CBAs as the dependent variable. Recall, from the discussion of Section 3, that these data are highly incomplete in the sense that for the majority of CBAs, SDC Platinum did not report the the deal value. Therefore, a preponderance of the aggregate deal values between source and host countries during a given year were zero-valued calling for the estimation of Tobit regressions. Though the t-statistics of the coefficient estimates turned out to be smaller when using aggregate deal values, a significant effect did arise with the EMTR. However, the severe caveats mentioned above warrant a cautious interpretation of these results.

[12] We have not calculated the international tax burden with the EMTR, since the withholding taxes, which enters the international tax burden, accrues to the after tax profits that are repatriated. Meanwhile, the EMTR measures the difference in post- and pre-tax rates of return, which is somewhat disconnected with the actual tax payments that define the value of e.g. tax credits.

[13] According to the t-test statistic $(\gamma_{\tau_{jt}} - \gamma_{\tau_{ijt}})/(\sigma(\tau_{jt}) + \sigma(\tau_{ijt}))$, with σ denoting the standard deviation of the coefficient estimates, the difference between the coefficient estimates pertaining to τ_{jt} and τ_{ijt} is statistically significant at any conventionally used level of rejection.

Table 4: Results with the International Tax Burden

Corporate Tax:	Statutory	EATR	Statutory	EATR	Statutory	EATR
	(1)	(2)	(3)	(4)	(5)	(6)
GDP	0.47***	0.43***	0.34***	0.32***	0.28***	0.26***
	(0.11)	(0.11)	(0.11)	(0.11)	(0.12)	(0.11)
Net Wage	0.02	0.01	0.01	0.01	-0.01	-0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Distance	-0.61***	-0.61***	-0.58***	-0.61***	-0.58***	-0.61***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Border	0.49***	0.49***	0.49***	0.50***	0.49***	0.49***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Investment Freedom	0.16***	0.16***	0.15***	0.15***	0.11***	0.12***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Trade Freedom	-0.03	-0.04	-0.01	-0.04	-0.01	-0.05
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Labour Market Freedom	0.01***	0.01***	0.003	0.005**	0.003	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Shareholder Rights	1.41***	1.39***	1.29***	1.20***	1.16***	1.05***
	(0.15)	(0.15)	(0.14)	(0.13)	(0.16)	(0.14)
EU_{it}*EU_{jt}	-0.52	-0.54	-0.50	-0.60	-0.54	-0.65
	(0.57)	(0.57)	(0.58)	(0.57)	(0.58)	(0.57)
(1-EU_{it})*EU_{jt}	0.01	-0.02	0.05	-0.04	0.01	-0.10
	(0.57)	(0.57)	(0.58)	(0.57)	(0.58)	(0.57)
$Euro_{it}$*$Euro_{jt}$	0.27**	0.27**	0.28***	0.26***	0.28***	0.25***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
(1-$Euro_{it}$)*$Euro_{jt}$	-0.36***	-0.36***	-0.35***	-0.32***	-0.31***	-0.28***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Exchange Rate	-0.50***	-0.53***	-0.51***	-0.57***	-0.55***	-0.61***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Corporate Tax	-0.40***	-0.41***				
(International: τ_{ijt})	(0.03)	(0.03)				
Corporate Tax			-0.26***	-0.28***	-0.24***	-0.23***
(Host: τ_{jt})			(0.06)	(0.06)	(0.06)	(0.06)
Corporate Tax			-0.12***	-0.13***		
(Double: $\tau_{ijt} - \tau_{jt}$)			(0.01)	(0.01)		
Corporate Tax					-0.09***	-0.06***
(Parent: τ_{ijt}–τ_{jt}–(1–τ_{jt})ω_{ijt})					(0.01)	(0.01)
Withholding Tax					-0.15***	-0.17***
($(1-\tau_{jt})\omega_{ijt}$)					(0.01)	(0.01)
Sales Tax	-0.20***	-0.17**	-0.18**	-0.16**	-0.26***	-0.28***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Labour Tax	0.07	0.08	0.06	0.06	0.01	0.02
	(0.05)	(0.05)	(0.06)	(0.05)	(0.06)	(0.05)
#cba	82,182	82,182	82,182	82,182	82,182	82,182
#obs	11,248	11,248	11,248	11,248	11,248	11,248
$\ln L$	-25,978	-26,013	-23,718	-25,837	-23,629	-25,786

Notes: The dependent variable is the number n_{ijt} of CBA deals between source country i and host country j during year t. Estimation is by maximum likelihood of a Poisson regression with fixed effects α_{it}. Aside from the dummy variables (Border, EU, Euro), the explanatory variables have been transformed into logarithms such that the coefficients reflect constant elasticities. All specifications include host country dummy variables δ_j. For the 1999 to 2010 period, the data cover all CBAs between the 32 source and 31 host countries listed in the data appendix. Furthermore, #cba is the total number of deals, #obs is the number of observations, and $\ln L$ the maximised value of the log likelihood function of the Poisson regression. Standard errors, clustered by α_{it}, are reported in parantheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

statutory and effective average rates, together with corporate taxes in the host country τ_{jt}, columns 3 and 4 introduce a separate variable for the double tax burden $\tau_{ijt}-\tau_{jt}$ arising when profits are repatriated to a given parent country. The effect is again negative. As discussed in Section 4, the additional taxes a MNE has to pay depend mainly on the tax system of the parent country and the withholding tax rates in the country from which the profits are repatriated. Columns 5 and 6 distinguish these components by attributing double taxes to the effect of withholding taxes $(1-\tau_{jt})\omega_{ijt}$ and the corporate taxes remaining to be paid in the parent country $\tau_{ijt}-\tau_{jt}-(1-\tau_{jt})\omega_{ijt}$. Note that the latter can vary across locations since the parent country tax rate depends, for example, on whether a bilateral income tax treaty has been signed with a given host country. Consistent with the findings of Barrios *et al.* (2012), for our case with CBAs, a significantly negative effect arises for the additional taxes in the parent country. The effect of withholding taxes is also significantly negative. The corresponding effect in Barrios *et al.* (2012) was insignificant which is perhaps not surprising since their sample contained only European countries where withholding taxes tend to be low and, for EU countries, even zero by virtue of the EU Parent-Subsidiary Directive.

6.3 Horizontal and Vertical CBAs

Following the procedure outlined in Section 3, Table 5 reports the results that relate to the distinction between the horizontal (columns 1 to 4) and vertical (in columns 5 to 8) strategies for FDI using the 5 per cent benchmark for $\overline{V}$ to identify deals that are deemed vertically related. Recall that the sample contains only deals where a 'purely' horizontal or vertical relationship between acquiring and target firms could be identified. Following the discussion above, the results have been calculated with statutory and effective average corporate tax rates. Furthermore, to account for the role of international effects (withholding taxes, tax credits, etc.), a distinction is made between corporate taxes measured by the host country rate (as in Table 3) and the international rate (as in columns 1 and 2 of Table 4).[14]

Some intuitive differences arise with respect to the impact of the control variables when CBAs are driven by different FDI strategies.[15] In particular, as expected, GDP has only a significant effect on horizontal CBAs, since they reflect the desire to access, preferably, large markets. Trade freedom has a negative effect on horizontal CBAs (though this is only significant at the 10 per cent level), which is maybe not surprising since it is relatively more attractive to serve a market via exports, rather than local production, the lower the trade barriers. Though the host countries encompass developed countries, a substantial fraction of CBAs in our sample seems to be driven by vertical strategies (see also Table 2). This is consistent with the findings of Alfaro and Charlton (2009), who suggested that a class of what they call high-skill intra-industry vertical strategies arises between countries that are similar in terms of, for example, wage cost. Against this background, the distinction between horizontal and vertical acquisition strategies does not give rise to large differences as regards the effect of wage costs.[16] Still, labour markets matter for separating the motives for horizontal and vertical acquisitions, but this effect is captured through labour market flexibility, which has a significant effect on vertical, but not horizontal CBAs.

With respect to the hypothesis of Mutti and Grubert (2004), for our comprehensive sample

[14] The detailed decomposition of the international tax effects on horizontal and vertical acquisitions along the lines reported in Table 4 are presented in a summary table below.

[15] In general, a likelihood ratio test $LR=-2(\ln L^{horizontal}-\ln L^{vertical})$ between the coefficients obtained for horizontal and vertical deals suggests that these models differ statistically in a highly significant manner.

[16] The outsourcing of labour intensive production stages to low wage countries arises probably mainly with emerging markets for which panel data on e.g. the EATR are not available. However, for the year 2004, some cross-sectional tax data for a larger set of host countries appears in Djankov *et al.* (2010). Based on this, we have experimented with a cross section of 43 host countries including large emerging markets such as Brazil, China, India, South Africa, Thailand, or Turkey. With this, a differential effect *does* arise in terms wage costs having a significant impact on vertical, but not on horizontal FDI. Furthermore, similar to the findings below, sales taxes enter with a negative sign for horizontal, but not for vertical FDI.

Table 5: Results for Horizontal and Vertical CBAs

FDI Strategy:	Purely Horizontal Cross Border Acquisitions				Purely Vertical Cross Border Acquisitions			
Tax Rate:	Statutory Tax Rate		Effective Average Tax Rate		Statutory Tax Rate		Effective Average Tax Rate	
Tax Measure:	Host	International	Host	International	Host	International	Host	International
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP	0.49*	0.55**	0.50**	0.54**	0.11	0.15	0.05	0.09
	(0.25)	(0.24)	(0.25)	(0.25)	(0.20)	(0.20)	(0.20)	(0.20)
Net Wage	0.02	0.02	0.02	0.02	-0.03	-0.02	-0.04	-0.03
	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)
Distance	-0.66***	-0.65***	-0.66***	-0.65***	-0.58***	-0.57***	-0.58***	-0.57***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Border	0.64***	0.65***	0.64***	0.65***	0.36***	0.39***	0.36***	0.38***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Investment Freedom	0.01	0.01	0.01	0.01	0.09	0.08	0.09	0.08
	(0.09)	(0.09)	(0.09)	(0.09)	(0.08)	(0.08)	(0.07)	(0.08)
Trade Freedom	-0.38*	-0.37*	-0.35*	-0.37*	0.14	0.16	0.13	0.14
	(0.21)	(0.21)	(0.21)	(0.21)	(0.14)	(0.14)	(0.14)	(0.14)
Labour Market Fd	-0.003	-0.002	-0.003	-0.002	0.01***	0.01***	0.01***	0.01***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)
Shareholder Rights	0.87**	0.94***	0.89**	0.95***	1.29***	1.29***	1.21***	1.24***
	(0.35)	(0.35)	(0.36)	(0.35)	(0.30)	(0.29)	(0.30)	(0.29)
EU_{it}*EU_{jt}	1.02	0.97	1.01	0.96	1.08	1.01	1.09	1.02
	(2.29)	(2.26)	(2.29)	(2.26)	(1.62)	(1.59)	(1.62)	(1.60)
(1-EU_{it})*EU_{jt}	1.75	1.70	1.75	1.69	1.65	1.59	1.65	1.60
	(2.29)	(2.26)	(2.29)	(2.26)	(1.62)	(1.59)	(1.62)	(1.60)
$Euro_{it}$*$Euro_{jt}$	0.24**	0.25***	0.24**	0.25**	0.36***	0.37***	0.35***	0.36***
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
(1-$Euro_{it}$)*$Euro_{jt}$	-0.51***	-0.49***	-0.51***	-0.49***	-0.38***	-0.36***	-0.39***	-0.36***
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Exchange Rate	-0.55***	-0.50***	-0.54***	-0.51***	-0.60***	-0.55***	-0.63***	-0.59***
	(0.12)	(0.11)	(0.11)	(0.11)	(0.10)	(0.09)	(0.09)	(0.09)
Corporate Tax	0.02	-0.23***	-0.003	-0.27***	-0.19*	-0.45***	-0.08	-0.38***
	(0.13)	(0.06)	(0.13)	(0.08)	(0.10)	(0.05)	(0.10)	(0.06)
Sales Tax	-0.62***	-0.66***	-0.63***	-0.64***	-0.18	-0.18	-0.14	-0.14
	(0.17)	(0.16)	(0.17)	(0.17)	(0.13)	(0.13)	(0.13)	(0.13)
Labour Tax	0.11	0.11	0.11	0.12	-0.04	-0.03	-0.04	-0.02
	(0.13)	(0.13)	(0.13)	(0.13)	(0.10)	(0.15)	(0.10)	(0.10)
#cba	15,671	15,671	15,671	15,671	24,250	24,250	24,250	24,250
#obs	11,248	11,248	11,248	11,248	11,248	11,248	11,248	11,248
$\ln L$	-10,083	-10,077	-10,084	-10,078	-12,840	-12,804	-12,841	-12,824

Notes: The dependent variable is the number n_{ijt} of CBA deals between source country i and host country j during year t. Estimation is by maximum likelihood of a Poisson regression with fixed effects α_{it}. Aside from the dummy variables (Border, EU, Euro), the explanatory variables have been transformed into logarithms such that the coefficients reflect constant elasticities. All specifications include host country dummy variables δ_j. The data cover purely horizontal or vertical CBAs (defined according to $\overline{V} = 5\%$). #cba is the total number of deals, #obs is the number of observations, and $\ln L$ the maximised value of the log likelihood function of the Poisson regression. Standard errors, clustered by α_{it}, are reported in parantheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

of CBAs, there is some evidence that the effect of corporate taxes is greater on MNEs pursuing vertical strategy of multinational integration. The tax elasticities are in general more negative for vertical CBAs. However, the corresponding difference with the horizontal case is, according to the t-test statistic introduced in footnote 13, only then statistically significant when taxes are measured by statutory rates and international tax effects are taken into account (difference between columns 2 and 5). Furthermore, similar to the result of Table 4, for both horizontal and vertical CBAs, corporate taxes matter more when international tax considerations are taken into account. In particular, when measuring taxes with the host country rate (in the odd columns), the effect is insignificant. Again, there is no evidence that the possibility to defer the repatriation of profits lowers the impact of the international tax burden for horizontal or vertical CBAs.

With respect to indirect taxes, labour taxes are insignificant for both forms of acquisitions. However, a striking difference that arises in Table 5 is that sales taxes do have a negative and highly significant impact on horizontal CBAs while the corresponding coefficient is lower, and insignificant, for vertical acquisitions. This result, which has to our knowledge not been observed before, is intuitive since exported goods are often exempted from local sales taxes and the primary rationale for vertical integration relates exactly to the production of intermediate inputs to downstream stages of the supply chain located in other countries. Conversely, with horizontal acquisitions, MNEs integrate a foreign plant to produce and sell goods locally such that the sales tax should matter.

6.4 Robustness Checks

The results reported above are robust to the following changes in variable definitions and, in the case of distinguishing between horizontal and vertical acquisitions, to changes in the vertical-relatedness benchmark.

Controlling for role of institutional quality in FDI is a thorny issue. A broad range of often highly correlated variables encompassing such things as the protection of property rights, the pervasiveness of corruption, regulatory efficiency, or the openness of a country to foreign business have been found to affect FDI (see e.g. Daude and Stein, 2007). To comprehensively account for the plethora of institutional quality variables, we have recalculated the results with a composite index of economic freedom, which summarises variables pertaining to the rule of law, government efficiency, regulatory efficiency, and open markets. However, this did not change the essence of our tax results.

Note from the discussion of Section 5 that all our results have been calculated with fixed effects α_{it} that absorb any variable that does not differ across host countries.[17] Among many other things, this accounts for trade freedom in the source country, which could inhibit vertical acquisitions involving exports from the host country back to the source country. Aside of producing a connection with the location choice model, the specification of the fixed effect with α_{it} has also the advantage of eliminating the issue as to whether the explanatory variables need transforming into logarithmic *differences*. For taxes, both the levels (e.g. Buettner and Ruf, 2007) and differences (e.g. Huizinga and Voget, 2009) have been used. However, since the fixed effect α_{it} absorbs all source and year specific heterogeneity, the same coefficient estimates arise when the tax burden is expresses in (log) levels of a host country or the corresponding (log) difference between source and host country.

A key feature in terms of highlighting the differences across alternative forms of CBAs is the characterisation of horizontal and vertical acquisitions. In the results reported in Table 5, the 5 per cent value was used for $\overline{V}$ to define vertical relatedness. Changing the vertical relatedness benchmark reallocates the proportion of CBAs between the horizontal

[17] The dummy variables δ_j further account for any specific variable shifting the intercept of the host country.

Table 6: Ranges of Tax Elasticities for CBAs

	All CBAs	Horizontal CBAs	Vertical CBAs
	Corporate Tax measured by Statutory Rate		
International Tax	-0.40	-0.23	-0.45
• Host Country Tax	-0.20 to -0.26	0	-0.19 to -0.28
• Source Country Tax	-0.09	-0.08	-0.09
• Withholding Tax	-0.15	-0.12	-0.16
	Corporate Tax measured by EATR		
International Tax	-0.41	-0.27	-0.38
• Host Country Tax	-0.16 to -0.28	0	0
• Source Country Tax	-0.06	-0.06	-0.07
• Withholding Tax	-0.17	-0.14	-0.18
	Sales Tax		
Sales Tax	-0.15 to -0.28	-0.62 to -0.64	0

Notes: This table provides an overview of the measured tax elasticities according to (13) across the results reported in Tables 3 to 5. For all contingencies the maximum and minimum value is reported. In case a coefficient is insignificant, a value of 0 is reported.

and vertical strategies (see Section 3). The results with the alternative values for $\overline{V}$ are reported in Appendix Tables 5a and 5b. Table 5a relate to an increase of $\overline{V}$ to 10 per cent. This makes the definition of vertical acquisitions more stringent to pass and increases the number of CBA deals that are classified as horizontal. In terms of the underlying determinants, market size continues to be a determinant of horizontal, but not vertical acquisitions. The tax elasticities (relating to the international tax measure) are significant for both forms of acquisitions but are now approximately equal. However, of particular note is that the sales tax still acts as a negative deterrent of horizontal acquisitions but has a weaker effect on vertical acquisitions, the negative effect being statistically significant at the 10 per cent level only. The results with the 1 per cent value for $\overline{V}$ are reported in Appendix Table 5b. With this benchmark, deals that are deemed to be vertical dominate and the delineation between the alternative forms becomes less clear. In terms of the corporate tax elasticities, they are higher with vertical acquisitions compared with the horizontal sample. The difference in sales taxes still appears but is now only significant at the 10 per cent level for the horizontal acquisitions, but remains insignificant for vertical acquisitions.

6.5 Summary of Tax Elasticities

To sum up, distinguishing between the different tax measures and FDI strategies, Table 6 provides an overview of the elasticities pertaining to the impact of corporate income and sales taxes. In the cases where several estimates appear across the different specifications of Tables 3 to 5, the range with the highest and lowest values of the results is reported. Nonetheless, a relatively consistent picture arises where the corporate tax elasticity on CBAs is around $-2/5$ when international tax considerations are taken into account. This effect can be disentangled into a host country tax effect with an elasticity of around $-1/4$ as well as the effect of additional taxes to be paid in the source (or parent) country as well as withholding taxes which impact upon CBAs with an elasticity of less than $-1/10$ and around $-1/6$, respectively. Across FDI strategies, the effect of corporate taxes is slightly higher for vertical CBAs. Finally, the elasticity pertaining to the effect of sales taxes on CBAs appears to be around $-1/5$ with substantially higher effects of up to $-2/3$ for CBAs driven by a horizontal strategy whilst the effect is insignificant—and hence a zero value is reported—for vertical CBAs.

7 Summary and Conclusion

Attracting foreign direct investment (FDI) can be a goal for policy-makers and taxes provide a possible instrument to achieve this. Previous research has emphasised the role of modest direct corporate taxes to increase a country's appeal as host for FDI and suggested that the corresponding effect is potentially high. For a large sample with more than 80,000 cross-border acquisitions (CBAs), which is by far the most common form of FDI, between 30 major countries during 1999 to 2010 period, this paper has found the following tax effects.

i. The effect of various forms of taxes upon the desire of multinational enterprises to acquire a target firm in a given host country is broadly negative.

ii. For corporate taxes, the elasticity lies broadly between $-1/10$ and $-2/5$ and for sales taxes around $-1/4$.

iii. The effect of corporate taxes depends on the exact measure of taxation, whether the role of the international tax burden is taken into account, as well as the FDI strategy pursued by the multinational enterprise. In particular, double taxation—which arises when the same profit is also taxed in the parent country and when withholding taxes have to be paid in the host country when repatriating profits—increases the detrimental effect of corporate taxes on CBAs.

iv. For the case of sales taxes, the effect arises primarily with CBAs that are driven by a horizontal strategy, implying that an affiliate is integrated into the multinational enterprise to sell to the local market. No significant effect on the sales tax could be found with vertical CBAs, which involve subsidiaries producing export goods, on which the sales tax can normally be reimbursed at the border.

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Country Coverage

The common sample covers the following countries. Wage data of UBS (various years) refer to the cities in parentheses:

As source: Australia (Sydney), Austria (Vienna), Belgium (Brussels), Brazil (Sao Paulo), Canada (Toronto), China (Shanghai), Czech Republic (Prague), Denmark (Copenhagen), Finland (Helsinki), France (Paris), Germany (Frankfurt), Greece (Athens), Hongkong (Hongkong), Hungary (Budapest), Indonesia (Djakarta), Ireland (Dublin), Italy (Milan), Japan (Tokyo), Mexico (Mexico City), Netherlands (Amsterdam), Norway (Oslo), Poland (Warsaw), Portugal (Lisbon), Russia (Moscow), Singapore (Singapore), Slovakia (Bratislava), South Africa (Johannesburg), Spain (Madrid), Sweden (Stockholm), Switzerland (Zurich), United Kingdom (London), United States (Washington).

The common sample covers the following host countries. Wage data of UBS (various years) refer to the cities in parentheses:

As host: Argentina (Buenos Aires), Australia (Sydney), Austria (Vienna), Belgium (Brussels), Brazil (Sao Paulo), Canada (Toronto), Chile (Santiago de Chile), Denmark (Copenhagen), Finland (Helsinki), France (Paris), Germany (Frankfurt), Greece (Athens), India (Mumbai), Indonesia (Djakarta), Ireland (Dublin), Israel (Tel Aviv), Italy (Milan), Japan (Tokyo), Korea (Seoul), Mexico (Mexico City), Netherlands (Amsterdam), New Zealand (Auckland), Norway (Oslo), Portugal (Lisbon), South Africa (Johannesburg), Spain (Madrid), Sweden (Stockholm), Switzerland (Zurich), Turkey (Istanbul), United Kingdom (London), United States (Washington).

Data Appendix: Description of the Data Set

Variable	*Description*	*Source*
Dependent Variable:		
n_{ijt}	Number of cross border acquisition deals between the source country i and host country j during year t.	Compiled .
Tax Variables		
Corporate Tax (Statutory Rate)	Statutory tax rate on corporate income in country j.	KPMG, Corporate and Indirect Tax Survey.
Corporate Tax (EATR)	Effective average tax rate (EATR) on corporate income in country j.	CBT Tax Database (2012)).
Corporate Tax (EMTR)	Effective marginal tax rate (EMTR) on corporate income in country j. This is calculated by the difference between the pre-tax and post-tax required rates of return.	CBT Tax Database (2012).
Sales Tax	Value added tax (VAT) rate and other sales taxes.	IMF, Tax Policy Division.
Labour Tax	Compulsory social security and income tax contributions in percent of gross salaries. Data are published on a tri-annual basis. Values of the missing years have been filled with the closest observation available.	UBS, Prices and Earnings.
Withholding Tax	Withholding tax between countries assuming that profits are repatriated in form of dividends	KPMG, Corporate and Indirect Tax Survey. Deloitte International Tax Source.
Control Variables:		
Border	Common border between source and host country.	Compiled.
Distance	Great circular between the capital city of the source and host country.	Compiled.
$EU_{it} * EU_{jt}$	Variable indicating the EU membership of the source and host country	Compiled.
$(1-EU_{it})*EU_{jt}$	Variable indicating the EU membership of the host (but not the source) country	Compiled.
$EURO_{it} * EURO_{jt}$	Variable indicating that the source and host country share the Euro as common currency	compiled.
$(1 - EURO_{it}) * EURO_{jt}$	Variable indicating the EURO membership of the host (but not the source) country	Compiled.
Exchange Rate	Real (bilateral) exchange rate with US$.	World Development Indicators.
GDP	Real gross domestic product in US$ with base year 2000 of the host country j.	World Development Indicators.
Investment Freedom	Index of freedom of investment referring to whether there is a foreign investment code that defines the country's investment laws and procedures; whether the government encourages foreign investment through fair and equitable treatment of investors; whether there are restrictions on access to foreign exchange; whether foreign firms are treated the same as domestic firms under the law whether the government imposes restrictions on payments, transfers, and capital transactions; and whether specific industries are closed to foreign investment.	Heritage Foundation.
Labour Freedom	Index of labor market freedom on a scale from 10 to 90 measuring dimension such as minimum wages, regulation against layoffs, regulatory burden on hirings etc.	Heritage Foundation.
Net Wage	Wage in the host country net of compulsory social security contributions. Wages are measured by an index referring to the hourly income of 13 comparable professions as paid in the capital city or the financial center of a country. Data are published on a tri-annual basis. Values of the missing years have been filled with the closest observation available.	UBS, Prices and Earnings.
Shareholder Rights	Shareholder rights are measured by an anti-directors rights index reflecting (i) the possibility of shareholders to mail their proxy vote, (ii) whether shareholders are required to deposit their shares prior to the General Shareholders Meeting (iii) whether cumulative voting is allowed (iv) an oppressed minorities mechanism exists (5) whether the minimum stake allowing shareholders to call for an extraordinary shareholders meeting is more or less than 10%. Higher values mean more power for shareholders.	La Porta *et al.* (1998)
Trade Freedom	Index of freedom of international trade (tariff and non-tariff barriers) on a scale from 10 to 90.	Heritage Foundation.

Table 5a: Results for Horizontal and Vertical CBAs

FDI Strategy:	Purely Horizontal Cross Border Acquisitions				Purely Vertical Cross Border Acquisitions			
Tax Rate:	Statutory Tax Rate		Effective Average Tax Rate		Statutory Tax Rate		Effective Average Tax Rate	
Tax Measure:	Host	International	Host	International	Host	International	Host	International
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP	0.41**	0.45**	0.39**	0.42**	0.25	0.24	0.21	0.23
	(0.19)	(0.18)	(0.18)	(0.18)	(0.31)	(0.31)	(0.31)	(0.31)
Net Wage	0.004	0.01	0.003	0.01	-0.01	0.01	-0.01	-0.01
	(0.05)	(0.05)	(0.05)	(0.05)	(0.09)	(0.09)	(0.07)	(0.09)
Distance	-0.65***	-0.64***	-0.65***	-0.64***	-0.57***	-0.56***	-0.57***	-0.56***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Border	0.63***	0.64***	0.63***	0.64***	0.02	0.04	0.02	0.04
	(0.02)	(0.02)	(0.02)	(0.02)	(0.05)	(0.05)	(0.05)	(0.05)
Investment Freedom	0.13*	0.12*	0.13*	0.12*	0.06	0.05	0.06	0.05
	(0.07)	(0.07)	(0.07)	(0.07)	(0.12)	(0.12)	(0.12)	(0.08)
Trade Freedom	0.04	0.06	0.04	0.04	0.13	0.14	0.12	0.13
	(0.14)	(0.14)	(0.14)	(0.14)	(0.20)	(0.20)	(0.20)	(0.20)
Labour Market Fd	-0.001	0.001	-0.001	-0.001	0.01*	0.01*	0.01	0.01*
	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.005)	(0.006)	(0.006)
Shareholder Rights	1.28**	1.30**	1.29**	1.28***	1.31***	1.28***	1.29***	1.27***
	(0.27)	(0.26)	(0.36)	(0.35)	(0.44)	(0.44)	(0.45)	(0.45)
EU_{it}*EU_{jt}	-0.99	-1.01	-1.00	-1.02	0.47	0.44	0.47	0.43
	(0.72)	(0.72)	(0.72)	(0.72)	(2.00)	(1.98)	(2.99)	(1.99)
(1-EU_{it})*EU_{jt}	-0.23	-0.24	-0.23	-0.25	0.82	0.80	0.83	0.79
	(0.72)	(0.72)	(0.72)	(0.72)	(2.00)	(1.98)	(2.00)	(1.99)
$Euro_{it}$*$Euro_{jt}$	0.20**	0.20**	0.20**	0.20**	0.50***	0.51***	0.51***	0.51***
	(0.09)	(0.09)	(0.09)	(0.09)	(0.19)	(0.19)	(0.19)	(0.19)
(1-$Euro_{it}$)*$Euro_{jt}$	-0.49***	-0.46***	-0.49***	-0.46***	-0.40**	-0.38*	-0.39*	-0.37*
	(0.09)	(0.09)	(0.09)	(0.09)	(0.19)	(0.19)	(0.19)	(0.20)
Exchange Rate	-0.60***	-0.55***	-0.60***	-0.58***	-0.44***	-0.42***	-0.45***	-0.44***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.15)	(0.09)	(0.14)	(0.14)
Corporate Tax	-0.10	-0.33***	-0.12	-0.30***	-0.15	-0.26***	-0.12	-0.29***
	(0.09)	(0.05)	(0.09)	(0.06)	(0.17)	(0.08)	(0.17)	(0.10)
Sales Tax	-0.28***	-0.29**	-0.26**	-0.27**	-0.39*	-0.39*	-0.36*	-0.36*
	(0.12)	(0.12)	(0.12)	(0.12)	(0.20)	(0.20)	(0.20)	(0.20)
Labour Tax	0.03	0.04	0.04	0.05	-0.003	-0.002	0.001	-0.01
	(0.09)	(0.09)	(0.09)	(0.09)	(0.15)	(0.15)	(0.15)	(0.15)
#cba	30,156	30,156	30,156	30,156	9,223	9,223	9,223	9,223
#obs	11,248	11,248	11,248	11,248	11,248	11,248	11,248	11,248
$\ln L$	-13,794	-13,770	-13,794	-13,782	-8,042	-8,037	-8,842	-8,038

Notes: The dependent variable is the number n_{ijt} of CBA deals between source country i and host country j during year t. Estimation is by maximum likelihood of a Poisson regression with fixed effects α_{it}. Aside from the dummy variables (Border, EU, Euro), the explanatory variables have been transformed into logarithms such that the coefficients reflect constant elasticities. All specifications include host country dummy variables δ_j. The data cover purely horizontal or vertical CBAs (defined according to $\overline{V} = 10\%$). #cba is the total number of deals, #obs is the number of observations, and $\ln L$ the maximised value of the log likelihood function of the Poisson regression. Standard errors, clustered by α_{it}, are reported in parantheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 5b: Results for Horizontal and Vertical CBAs

FDI Strategy:	Purely Horizontal Cross Border Acquisitions				Purely Vertical Cross Border Acquisitions			
Tax Rate:	Statutory Tax Rate		Effective Average Tax Rate		Statutory Tax Rate		Effective Average Tax Rate	
Tax Measure:	Host	International	Host	International	Host	International	Host	International
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP	-0.04	0.05	-0.04	0.02	0.26*	0.28*	0.21	0.24
	(0.41)	(0.40)	(0.40)	(0.40)	(0.15)	(0.14)	(0.14)	(0.14)
Net Wage	0.02	0.03	0.02	0.02	0.002	0.01	-0.001	0.004
	(0.10)	(0.10)	(0.10)	(0.10)	(0.04)	(0.04)	(0.04)	(0.04)
Distance	-0.70***	-0.69***	-0.70***	-0.69***	-0.61***	-0.60***	-0.61***	-0.60***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
Border	0.68***	0.70***	0.68***	0.69***	0.44***	0.46***	0.44***	0.46***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.01)	(0.02)	(0.02)	(0.02)
Investment Freedom	0.05	0.05	0.05	0.05	0.23***	0.22***	0.23***	0.22***
	(0.15)	(0.15)	(0.15)	(0.15)	(0.05)	(0.05)	(0.05)	(0.05)
Trade Freedom	-0.13	-0.12	-0.13	-0.13	0.06	0.06	0.05	0.05
	(0.34)	(0.34)	(0.34)	(0.34)	(0.10)	(0.10)	(0.10)	(0.10)
Labour Market Fd	-0.01	0.01	-0.01	-0.01	0.01***	0.01***	0.01***	0.01***
	(0.008)	(0.007)	(0.008)	(0.007)	(0.003)	(0.003)	(0.003)	(0.003)
Shareholder Rights	0.05	0.12	0.04	0.10	1.35***	1.34***	1.31***	1.31***
	(0.59)	(0.58)	(0.59)	(0.57)	(0.21)	(0.21)	(0.21)	(0.21)
EU_{it}*EU_{jt}	-11.46	-11.45	-11.46	-11.45	0.15	0.12	0.15	0.11
	(11.43)	(11.43)	(11.44)	(11.47)	(0.93)	(0.92)	(0.93)	(0.92)
(1-EU_{it})*EU_{jt}	-12.14	-12.13	-12.14	-12.13	0.67	0.65	0.68	0.65
	(11.43)	(11.43)	(11.44)	(11.47)	(0.93)	(0.92)	(0.93)	(0.92)
$Euro_{it}$*$Euro_{jt}$	0.56**	0.56**	0.56**	0.56**	0.24***	0.24***	0.24***	0.24***
	(0.18)	(0.18)	(0.18)	(0.18)	(0.08)	(0.08)	(0.08)	(0.08)
(1-$Euro_{it}$)*$Euro_{jt}$	-0.21	-0.19	-0.21	-0.19	-0.42***	-0.39***	-0.42***	-0.39***
	(0.18)	(0.18)	(0.18)	(0.19)	(0.08)	(0.08)	(0.08)	(0.08)
Exchange Rate	-0.31***	-0.27***	-0.32***	-0.29***	-0.59***	-0.54***	-0.61***	-0.57***
	(0.18)	(0.18)	(0.18)	(0.18)	(0.07)	(0.07)	(0.07)	(0.06)
Corporate Tax	-0.03	-0.31***	-0.01	-0.29**	-0.18**	-0.41***	-0.12	-0.39***
	(0.20)	(0.10)	(0.20)	(0.13)	(0.08)	(0.04)	(0.07)	(0.10)
Sales Tax	-0.47*	-0.51*	-0.46*	-0.48*	0.03	0.02	0.06	0.05
	(0.28)	(0.27)	(0.27)	(0.27)	(0.10)	(0.09)	(0.09)	(0.20)
Labour Tax	0.36	0.36	0.38*	0.37*	-0.09	-0.08	-0.08	-0.07
	(0.20)	(0.20)	(0.20)	(0.19)	(0.07)	(0.07)	(0.07)	(0.07)
#cba	6,373	6,373	6,373	6,373	46,874	46,874	46,874	46,874
#obs	11,248	11,248	11,248	11,248	11,248	11,248	11,248	11,248
$\ln L$	-5,778	-5,774	-5,778	-5,775	-18,737	-18,677	-18,738	-18,704

Notes: The dependent variable is the number n_{ijt} of CBA deals between source country i and host country j during year t. Estimation is by maximum likelihood of a Poisson regression with fixed effects α_{it}. Aside from the dummy variables (Border, EU, Euro), the explanatory variables have been transformed into logarithms such that the coefficients reflect constant elasticities. All specifications include host country dummy variables δ_j. The data cover purely horizontal or vertical CBAs (defined according to $\overline{V} = 1\%$). #cba is the total number of deals, #obs is the number of observations, and $\ln L$ the maximised value of the log likelihood function of the Poisson regression. Standard errors, clustered by α_{it}, are reported in parantheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Reviewers Appendix

Results for Statutory and Effective Tax Rates

Corporate Tax:	Statutory Rate		EATR		EMTR	
	(1)	(2)	(3)	(4)	(5)	(6)
GDP	0.37***	0.37***	0.33***	0.32***	0.30***	0.29***
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
Net Wage	0.02	0.03	0.03	0.02	0.03	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Distance	-0.62***	-0.62***	-0.62***	-0.62***	-0.62***	-0.62***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Border	0.47***	0.47***	0.47***	0.47***	0.47***	0.47***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Economic Freedom	0.44***	0.30**	0.42***	0.30*	0.41***	0.41***
	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.16)
Shareholder Rights	1.47***	1.45***	1.44***	1.40***	1.40***	1.34***
	(0.13)	(0.14)	(0.13)	(0.13)	(0.13)	(0.13)
EU_{it}*EU_{jt}	-0.49	-0.48	-0.49	-0.48	-0.48	-0.47
	(0.61)	(0.57)	(0.57)	(0.57)	(0.57)	(0.57)
(1-EU_{it})*EU_{jt}	0.01	0.03	-0.01	0.03	0.02	0.03
	(0.61)	(0.57)	(0.57)	(0.57)	(0.57)	(0.57)
$Euro_{it}$*$Euro_{jt}$	0.28***	0.27***	0.27***	0.26***	0.27***	0.26***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
(1-$Euro_{it}$)*$Euro_{jt}$	-0.38***	-0.38***	-0.37***	-0.38***	-0.37***	-0.38***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Exchange Rate	-0.53***	-0.53***	-0.54***	-0.55***	-0.56***	-0.56***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Corporate Tax (τ_{jt})	-0.13**	-0.18***	-0.11*	-0.13**	-0.04	-0.04
(Host Country)	(0.05)	(0.06)	(0.06)	(0.06)	(0.03)	(0.03)
Sales Tax		-0.28***		-0.25**		-0.23***
		(0.07)		(0.07)		(0.07)
Labour Tax		0.09		0.09		0.09
		(0.05)		(0.05)		(0.05)
#cba	82,182	82,182	82,182	82,182	82,182	82,182
#obs	11,248	11,248	11,248	11,248	11,248	11,248
$\ln L$	-26,095	-26,087	-26,096	-26,090	-26,097	-26,091

Notes: The dependent variable is the number n_{ijt} of CBA deals between source country i and host country j during year t. Estimation is by maximum likelihood of a Poisson regression with fixed effects α_{it}. Aside from the dummy variables (Border, EU, Euro), the explanatory variables have been transformed into logarithms such that the coefficients reflect constant elasticities. All specification include host country dummy variables δ_j. For the 1999 to 2010 period, the data cover all CBAs between the 32 source and 31 host countries listed in the data appendix. Furthermore, #cba is the total number of deals, #obs is the number of observations, and $\ln L$ the maximised value of the log likelihood function of the Poisson regression. Standard errors, clustered by α_{it}, are reported in parentheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Results with the International Tax Burden

Corporate Tax:	Statutory	EATR	Statutory	EATR	Statutory	EATR
	(1)	(2)	(3)	(4)	(5)	(6)
GDP	0.40***	0.35***	0.26**	0.24**	0.25**	0.22**
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
Net Wage	0.04	0.02	0.02	0.01	0.01	-0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Distance	-0.61***	-0.61***	-0.58***	-0.61***	-0.58***	-0.61***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Border	0.49***	0.49***	0.49***	0.50***	0.49***	0.49***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Economic Freedom	0.25*	0.22	0.39**	0.31**	0.43***	0.36**
	(0.15)	(0.15)	(0.16)	(0.15)	(0.16)	(0.15)
Shareholder Rights	1.46***	1.41***	1.22***	1.19***	1.11***	1.07***
	(0.13)	(0.13)	(0.14)	(0.13)	(0.14)	(0.14)
EU_{it}*EU_{jt}	-0.50	-0.51	-0.48	-0.58	-0.53	-0.64
	(0.57)	(0.57)	(0.58)	(0.57)	(0.58)	(0.57)
(1-EU_{it})*EU_{jt}	0.01	0.001	0.07	-0.02	0.01	-0.09
	(0.57)	(0.57)	(0.58)	(0.57)	(0.58)	(0.57)
$Euro_{it}$*$Euro_{jt}$	0.27**	0.27**	0.28***	0.26***	0.28***	0.26***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
(1-$Euro_{it}$)*$Euro_{jt}$	-0.36***	-0.35***	-0.34***	-0.32***	-0.30***	-0.28***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Exchange Rate	-0.49***	-0.52***	-0.50***	-0.56***	-0.55***	-0.61***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Corporate Tax	-0.40***	-0.40***				
(International: τ_{ijt})	(0.03)	(0.03)				
Corporate Tax			-0.23***	-0.24***	-0.20***	-0.19***
(Host: τ_{jt})			(0.06)	(0.05)	(0.06)	(0.06)
Corporate Tax			-0.12***	-0.14***		
(Double: $\tau_{ijt} - \tau_{jt}$)			(0.01)	(0.01)		
Corporate Tax					-0.09***	-0.06***
(Parent: τ_{ijt}–τ_{jt}–(1–τ_{jt})ω_{ijt})					(0.01)	(0.01)
Withholding Tax					-0.15***	-0.17***
($(1-\tau_{jt})\omega_{ijt}$)					(0.01)	(0.01)
Sales Tax	-0.29***	-0.26**	-0.22**	-0.24**	-0.27***	-0.33***
	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)
Labour Tax	0.10**	0.11**	0.08	0.01	0.03	0.04
	(0.05)	(0.05)	(0.06)	(0.05)	(0.06)	(0.05)
#cba	82,182	82,182	82,182	82,182	82,182	82,182
#obs	11,248	11,248	11,248	11,248	11,248	11,248
$\ln L$	-25,991	-26,026	-23,723	-25,847	-23,630	-25,791

Notes: The dependent variable is the number n_{ijt} of CBA deals between source country i and host country j during year t. Estimation is by maximum likelihood of a Poisson regression with fixed effects α_{it}. Aside from the dummy variables (Border, EU, Euro), the explanatory variables have been transformed into logarithms such that the coefficients reflect constant elasticities. All specifications include host country dummy variables δ_j. For the 1999 to 2010 period, the data cover all CBAs between the 32 source and 31 host countries listed in the data appendix. Furthermore, #cba is the total number of deals, #obs is the number of observations, and $\ln L$ the maximised value of the log likelihood function of the Poisson regression. Standard errors, clustered by α_{it}, are reported in parantheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Results for Horizontal and Vertical CBAs

FDI Strategy:	Purely Horizontal Cross Border Acquisitions				Purely Vertical Cross Border Acquisitions			
Tax Rate:	Statutory Tax Rate		Effective Average Tax Rate		Statutory Tax Rate		Effective Average Tax Rate	
Tax Measure:	Host	International	Host	International	Host	International	Host	International
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP	0.31	0.37*	0.31	0.36*	0.28	0.36**	0.23	0.29
	(0.23)	(0.22)	(0.22)	(0.22)	(0.19)	(0.18)	(0.18)	(0.18)
Net Wage	0.02	0.02	0.02	0.02	-0.03	-0.01	-0.03	-0.02
	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)
Distance	-0.66***	-0.65***	-0.66***	-0.65***	-0.58***	-0.57***	-0.58***	-0.57***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Border	0.64***	0.65***	0.64***	0.65***	0.36***	0.39***	0.36***	0.38***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Economic Freedom	-0.37	-0.43	-0.38	-0.46	1.12***	1.04***	1.16***	1.05***
	(0.35)	(0.35)	(0.35)	(0.35)	(0.29)	(0.28)	(0.29)	(0.28)
Shareholder Rights	0.74**	0.82***	0.76**	0.82***	1.52***	1.61***	1.42***	1.53***
	(0.30)	(0.28)	(0.30)	(0.38)	(0.26)	(0.25)	(0.26)	(0.24)
EU_{it}*EU_{jt}	1.02	0.97	1.02	0.96	1.09	1.01	1.11	1.02
	(2.29)	(2.26)	(2.30)	(2.26)	(1.63)	(1.59)	(1.63)	(1.61)
(1-EU_{it})*EU_{jt}	1.76	1.71	1.75	1.70	1.65	1.59	1.67	1.60
	(2.29)	(2.26)	(2.30)	(2.26)	(1.63)	(1.59)	(1.63)	(1.61)
$Euro_{it}$*$Euro_{jt}$	0.24**	0.24***	0.24**	0.24**	0.37***	0.38***	0.36***	0.37***
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
(1-$Euro_{it}$)*$Euro_{jt}$	-0.51***	-0.49***	-0.51***	-0.49***	-0.38***	-0.35***	-0.38***	-0.35***
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Exchange Rate	-0.53***	-0.49***	-0.52***	-0.50***	-0.51***	-0.55***	-0.63***	-0.59***
	(0.12)	(0.11)	(0.11)	(0.11)	(0.09)	(0.09)	(0.09)	(0.09)
Corporate Tax	-0.01	-0.23***	-0.03	-0.28***	-0.10	-0.44***	-0.02	-0.35***
	(0.13)	(0.06)	(0.13)	(0.08)	(0.10)	(0.05)	(0.10)	(0.06)
Sales Tax	-0.67***	-0.70***	-0.67***	-0.69***	-0.13	-0.17	-0.10	-0.13
	(0.17)	(0.16)	(0.16)	(0.16)	(0.13)	(0.13)	(0.13)	(0.13)
Labour Tax	0.11	0.11	0.11	0.12	-0.01	-0.001	-0.01	0.05
	(0.13)	(0.12)	(0.13)	(0.12)	(0.10)	(0.09)	(0.10)	(0.10)
#cba	15,671	15,671	15,671	15,671	24,250	24,250	24,250	24,250
#obs	11,248	11,248	11,248	11,248	11,248	11,248	11,248	11,248
$\ln L$	-10,083	-10,078	-10,085	-10,079	-12,837	-12,802	-12,837	-12,822

Notes: The dependent variable is the number n_{ijt} of CBA deals between source country i and host country j during year t. Estimation is by maximum likelihood of a Poisson regression with fixed effects α_{it}. Aside from the dummy variables (Border, EU, Euro), the explanatory variables have been transformed into logarithms such that the coefficients reflect constant elasticities. All specifications include host country dummy variables δ_j. The data cover purely horizontal or vertical CBAs (defined according to $\overline{V} = 5\%$). #cba is the total number of deals, #obs is the number of observations, and $\ln L$ the maximised value of the log likelihood function of the Poisson regression. Standard errors, clustered by α_{it}, are reported in parantheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

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