

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

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## 1 Introduction

One of the key features of the modern and globalised world is foreign direct investment (FDI). FDI has increased in both absolute terms, and relative to gross domestic product (GDP), over the last few decades, and its importance has spawned a fairly sizeable economics literature that has attempted to explain its nature, causes and consequences, and the distinction between ‘horizontal’ FDI (where firms duplicate roughly the same activities in multiple countries) and ‘vertical’ FDI (which involves firms locating stages of production in different countries). However, differentiating between these two forms of FDI has remained an on-going challenge in the empirical literature on FDI.

From a public economics perspective, a broad consensus in the literature that taxes affect FDI has emerged,<sup>1</sup> but there has been limited empirical evidence on which taxes affect which type of investment, ‘horizontal’ or ‘vertical’? Since the motives behind these strategies differ, contingent on the factors that drive these alternative forms of FDI, the effect of taxes could also differ. The aim in this paper is, therefore, to explore the interaction between FDI strategies and tax policy, with a particular eye to whether international tax system rules matter for both types of investment. It does so by exploiting a large panel with an almost exhaustive coverage of cross border acquisitions (CBAs)—which has been the dominant form of FDI-across 30 countries and over a decade (1999 - 2010).

Specifically, this paper makes two contributions. Firstly, and drawing on the work by Fan and Lang (2000), Fan and Goyal (2006), Alfaro and Charlton (2009), Acemoglu *et al.* (2009), and Garfinkel and Hankins (2012), we differentiate between horizontal and vertical investment strategies. As noted, we use data CBAs which has two important advantages: it is the dominant form of FDI (UNCTAD, 2000, Di Giovanni, 2005), accounting for as much as 80 per cent of worldwide FDI in any given year and being particularly important in developed countries (Antras and Yeaple, 2014, p.66); in addition, the coverage of the location choices embodied in CBAs is extensive, as the data set contains in excess of 80,000 international deals between 1999 and 2010 across 30 countries.<sup>2</sup> Our second contribution is to derive

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<sup>1</sup>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).

<sup>2</sup>As will be noted shortly below, the estimation is performed by a suitably parameterized Poisson regression, which aggregates the location choices into a count variable and hence requires a much lower number of observations for estimation than a model of the (conditional) logit class.

the tax elasticity associated with alternative FDI strategies and identify which taxes affect which investment decision accounting also (following Barrios *et al.* (2012)) for the effect of international taxation (that is, differences in tax regimes, tax credits and withholding taxes) across countries. The analysis considers also the role of non-profit taxes on the location choices of multinational firms.<sup>3</sup>

The results show that the effect of various forms of taxes upon the incentive of multinationals to invest in a foreign country is broadly negative; this is consistent with much of the research on taxes and FDI that arises in the public finance literature. For corporate taxes, the elasticity lies broadly between  $-1/20$  and  $-9/20$ . 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 firm. 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 FDI. For sales taxes, the elasticity is around  $-1/4$  but the effect arises primarily with FDI that is driven by a horizontal strategy, where an affiliate is integrated into the multinational enterprise to access the local market. Conversely, no significant effect on the sales tax could be found with vertical FDI, which involves subsidiaries producing export goods, on which the sales tax can normally be reimbursed at the border.

With the extensive coverage of CBAs, the results in this paper differ from the extant literature: the estimated tax elasticity is lower than generally reported elsewhere but it also differs according to the underlying motivation for FDI; the effect of taxes depends on how double taxation and withholding taxes are treated with again notable differences between horizontal and vertical FDI; sales taxes do matter but it relates to specific forms of FDI.

The remainder of the paper is organised as follows. Section 2 provides a synoptic overview of the literature to which this paper relates. Section 3 outlines the methodology for identifying alternative strategies for foreign direct investment highlighting the distinction between horizontal and vertical CBAs. Section 4 addresses issues about the relevant tax measure for the MNE accounting for additional parent country and withholding taxes which may play a role in determining FDI. Section 5 presents the location choice 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 (CBAs) and foreign direct investment (FDI)

Discussion of the effects of taxes on FDI usually relies on data relating to FDI flows or stocks or sales from multinational affiliates (De Mooij and Ederveen, 2003, 2008). 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. This paper uses data on CBAs which, as noted already, presents two main advantages. First, CBAs are typically

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<sup>3</sup>Desai *et al.* (2004) have argued that, whilst international tax competition has led 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.

the dominant form via which FDI occurs and, second, CBA data are now available across a large number of countries and years. Reflecting this, a growing literature has begun to use 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 costs (Hijzen *et al.*, 2008), or the effect of the European integration (Coeurdacier *et al.*, 2009). In this literature, taxes have only appeared as a control variable on the distribution and growth of CBAs without addressing international tax issues. 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 premia of CBAs.

FDI and CBAs do not overlap perfectly since a multinational enterprise could also undertake greenfield investment. The early theoretical and empirical literature on FDI referred primarily to greenfield investment where foreign plants are built from scratch rather than being acquired. However, only small changes are required to adapt the standard framework for addressing FDI to the case of CBAs (Antras and Yeaple, 2014, p.83). Furthermore, a growing theoretical literature has started to look specifically at FDI through the lens of international mergers and acquisitions. This implies that FDI can be seen as an outcome of international market for corporate control, to use the title of Head and Ries (2008), where multinational enterprises engage in a bidding contest when they want to take control over foreign assets. From an empirical perspective, this provides the bridge to the location choice framework applied below, insofar as profits (and hence the bidding capacities) differ across potential host countries due to e.g. differences in corporate taxes. In this regard, our empirical strategy follows the approach of Hijzen *et al.* (2008) and Coeurdacier *et al.* (2009).

## 2.2 Determinants of FDI strategies

Research on domestic and international mergers and acquisitions has been developing across several sub-fields such as industrial organisation, finance, and international economics. Consequently, a large number of motivations for acquisitions have been identified: synergies, competition effects, technology transfers, spreading risks by means of diversification and so on. UNCTAD (2000) gives an overview of the wider considerations that may apply to CBAs and how the impact of CBAs in the host country may differ from greenfield investment. As regards corporate taxes, CBAs also raise additional issues associated with transfer pricing and corporate inversions. Notwithstanding these observations, in this paper, we focus more directly on the different forms of CBAs which ties with the difference between horizontal and vertical strategies that dominates in the international economics literature and research on FDI in general (see Antras and Yeaple (2014) for a recent survey).

Multinational firms 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. Vertical FDI involves the fragmentation of the supply chain, with the production abroad leading to the export of intermediate goods. Reflecting the different motives, horizontal and vertical FDI have been mostly associated with investment flows between, respectively, developed and developing countries. However, the dominance of horizontal FDI between developed countries has been questioned by Alfaro and Charlton (2009) who show—by directly measuring the vertical relatedness between affiliate activity and the parent company—that a substantial part of FDI between developed countries is actually vertical in nature with a large proportion of this being intra-industry (that is, within broad industry aggregates).<sup>4</sup>

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<sup>4</sup>The the determination of the FDI strategies outlined in Section 3, follows Alfaro and Charlton (2009).

Following the discussion above, it is relatively straightforward to apply the various FDI strategies to the case of CBAs (Antras and Yeaple, 2014, pp.83ff.). In particular, a horizontal motive would imply that a foreign acquisitions involves a target firm in the same industry to gain market access considerations whilst a vertical motive would imply that a foreign acquisition involves a target firm on a different stage of the value chain to out-source production stages.

### 2.3 The role of taxes

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 the market entry decisions that manifest in the acquisition of a foreign firm. To more appropriately capture the long-term implications of a foreign market entry that arise with FDI—e.g. taking into account the capital depreciation and tax allowances of such investments—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 (see Devereux and Griffiths, 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 Davies (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.<sup>5</sup> It is important to note that the methodology we apply follows Barrios *et al.* (2012) by relating to the discrete location decisions of MNEs. However, as discussed in Section 5, our econometric strategy can cope with the location choices embodied in the enormous number of 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. This hypothesis rests on the observation that in most countries the indirect tax burden levied on sales or labour cost of firms can exceed the amounts to be paid in direct corporate income tax. 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. But FDI can also be motivated by the fragmentation of supply chains and foreign subsidiaries producing intermediate goods that are usually exported back to the parent country (or some other

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<sup>5</sup>While the focus here is on tax elasticities, as we note throughout, there may be many issues associated with taxes and CBAs. As one of the referees pointed out, the role tax-havens may be a relevant. However, there is no country in our sample that appears on the OECD tax-haven list.

country). As sales taxes can usually be refunded at the border, they can be trade neutral (Keen and Syed, 2006).<sup>6</sup>

As regards corporate taxation, the differences between greenfield investment and mergers and acquisitions have appeared in Becker and Fuest (2010, 2011). However, these theoretical contributions are mainly concerned with the welfare effects of tax competition and coordination across different international tax systems. The only paper that has explicitly addressed the crucial distinction between horizontal and vertical integration is by Mutti and Grubert (2004). 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. However, apart from the lack of account for the role of double taxation and international tax relief, Mutti and Grubert (2004) also have no direct measure of vertical FDI. Still, the main merit of their paper is to tie with the focus of the international economics literature that MNEs pursue different strategies and that this might matter for the effect of taxation.

In sum, it is clear from the preceding discussion that different taxes can have a differential impact on the investment decisions of firms to invest in a foreign country. But establishing the exact effect of those taxes on CBAs necessitates a method that identifies FDI strategies, together with a careful consideration of double tax issues. It is the former issue that we next turn to.

### 3 Horizontal and vertical CBAs

Driven by the availability of detailed tax data, we focus on international CBAs between 32 source and 31 host countries.<sup>7</sup> During the 1999 to 2010 period, according to SDC Platinum of Thomson Reuters, these countries have 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 (among others, Rossi and Volpin (2004) and Di Giovanni (2005)) have 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, the literature (see, for instance, Herger *et al.* (2008), Hijzen *et al.* (2008), Huizinga and Voget (2009), and Erel *et al.* (2012)) has relied on the number of deals, which is almost exhaustively available, since SDC records virtually any change in ownership of at least 5 per cent.<sup>8</sup>

To disentangle the impact of taxation across FDI strategies, the challenge is to distinguish between horizontal and vertical CBAs. 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  $SIC_b$ .<sup>9</sup> 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.

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<sup>6</sup>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.

<sup>7</sup>The list of countries can be found in the data appendix.

<sup>8</sup>Results between count and value data can, of course, differ since they refer, respectively, to the effect of taxes on the location choice of a multinational firm and the amount to invest, once the decision to enter a foreign market has been taken. Econometric issues arising with event counts are discussed in Section 5.

<sup>9</sup>To accurately identify investment strategies pursued by multinational firms, Alfaro and Charlton (2009) strongly advocate the use of a highly disaggregated classification at the four-digit level. Arguably, this avoids the misclassification of a considerable number of acquisitions involving firms in adjacent industries as horizontal acquisitions.

When tying down vertical acquisitions, however, 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. More specifically, for every pair of industries,  $SIC_a$  and  $SIC_b$ , the `input:output` tables allow the calculation of 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 and denoted by  $V_{ab}$ —the greater the degree to which the corresponding industries are linked through the supply chain. By defining a benchmark  $\bar{V}$ , it is then possible to identify deals between firms operating in industries with  $V_{ab} > \bar{V}$  that are deemed to be vertically related. Following Alfaro and Charlton (2009), the 5 per cent benchmark for  $\bar{V}$  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 multinational firms, we analyse the horizontal and vertical relatedness between an acquirer, denoted by  $r$ , and target firm, denoted by  $s$ , across every potential pair of industries in which they operate. Since there are up to 6 industries for acquiring and a target firm there are up to 36 pairs which imply the following classification: as to whether CBAs involve firms that are horizontally, that is  $SIC_a^r = SIC_b^s$ , or vertically, that is  $V_{ab}^{rs} > \bar{V}$ , 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 FDI strategies.<sup>10</sup>

Table 1: **Definition of horizontal and vertical FDI**

<b>FDI strategy</b>	<b>Horizontal relatedness</b>	<b>Vertical relatedness</b>
Pure horizontal	$\exists r, s$ such that $SIC_a^r = SIC_b^s$	$V_{ab}^{rs} < \bar{V}, \forall r, s$
Pure vertical	$SIC_a^r \neq SIC_b^s, \forall r, s$	$\exists r, s$ such that $V_{ab}^{rs} > \bar{V}$

The distribution of the 82,182 CBAs between 1999 and 2010 in the sample of source and host countries is reported in Table 2. The second column shows the breakdown of all deals across the top 10 source and host countries. Notice that the same developed countries, that is the US, the UK, Canada, Germany, and France, are the most important source and host nations for CBAs and that they alone account already for more than half of all deals.

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,

<sup>10</sup>Notice that the classification can also produce 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 in, for example, 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.

Table 2: Number of CBAs, 1999-2010

	All CBAs	Horizontal ( $\bar{V}=5\%$ )	Vertical ( $\bar{V}=5\%$ )
Top 10 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
Netherlands	3,777	796	1,111
Sweden	3,216	754	870
Switzerland	2,992	602	864
Australia	2,832	480	814
Japan	2,654	330	939
..	..	..	..
Total	82,182	15,671	24,250
Top 10 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
Spain	3,096	770	756
Australia	3,052	413	881
Sweden	2,921	601	867
Italy	2,871	613	762
Netherlands	2,727	494	838
..	..	..	..
Total	82,182	15,671	24,250

around 50 per cent of all deals are classified as purely horizontal or vertical. Using the 5 per cent benchmark for  $\bar{V}$ , 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  $\bar{V}$ . 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  $\bar{V}$  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 Double taxation and international tax relief

Aside from the distinction between statutory and effective tax rates discussed in Section 2, international tax matters—and, in particular, double taxation and international tax relief—influence investment decisions. Following Huizinga and Voget (2009) and Barrios *et al.* (2012), the consolidated tax burden, denoted by  $\tau_{ijt}$ , from FDI between source country  $i$  into host country  $j$  during year  $t$  is given by

$$\tau_{ijt} = \tau_{jt} + \tau_{it} + (1 - \tau_{jt})\omega_{ijt}, \quad (1)$$

where  $\tau_{jt}$  is the host country tax rate,  $\tau_{it}$  is the source country  $i$  tax rate, and  $\omega_{ijt}$  captures any withholding taxes when multinationals repatriate the after-tax profits, given by  $(1 - \tau_{jt})$ , to the source country  $i$ . Since most FDI is subject to some double tax relief, the tax rate in (1) is rarely applied in practice. The amount of double tax relief depends on 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 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 multinationals is, then,

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

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.<sup>11</sup> The international tax burden on the multinationals is, then,

$$\tau_{ijt} = \tau_{it} + \tau_{jt} + (1 - \tau_{jt})\omega_{ijt} - c_{ijt}, \quad (3)$$

where  $c_{ijt}$  denotes the tax credits.

With an indirect tax credit system corporate and withholding taxes are both creditable, that is  $c_{ijt}^i = \tau_{jt} + (1 - \tau_{jt})\omega_{ijt}$  whereas direct tax credits apply only to withholding taxes meaning  $c_{ijt}^d = (1 - \tau_{jt})\omega_{ijt}$ . Since the tax credit is restricted to the tax burden that would accrue to the same profit in the parent country, we have that  $c_{ijt}^i = \min[\tau_{it}, \tau_{jt} + (1 - \tau_{jt})\omega_{ijt}]$  and  $c_{ijt}^d = \min[\tau_{it}, \omega_{ijt}]$  (Huizinga and Voget, 2009, p.1223). In sum, the international tax burden equals

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

for the indirect tax credit system and

$$\tau_{ijt}^d = \begin{cases} \tau_{jt} + (1 - \tau_{jt}^d)\omega_{ijt} & \text{if } \omega_{ijt} > \tau_{it} \\ \tau_{jt} + (1 + \omega_{ijt})\tau_{it} & \text{if } \omega_{ijt} < \tau_{it}, \end{cases} \quad (5)$$

for the direct tax credit system (see also Barrios *et al.*, 2012, pp. 949ff.).<sup>12</sup>

One issue in dealing with double taxation and international tax relief is the potential to defer the repatriation of profits and, hence, postpone the payment of corporate taxes in the home country.<sup>13</sup> 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  $\tau_{jt}$  and the international tax burden  $\tau_{ijt}$  is that this might shed light into the importance of deferral (Barrios *et al.*, 2012, p.951). In particular, a lower impact of  $\tau_{ijt}$  compared with  $\tau_{jt}$  could suggest that the repatriation of profits is often deferred to a degree

<sup>11</sup>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.

<sup>12</sup>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  $1 - (1 - t_{it})(1 - \tau_{jt})(1 - \omega_{ijt})$ .

<sup>13</sup>Another issue is that effective tax rates are usually calculated for local conditions, whilst in an international context, the tax burden on an investment depends also on the conditions abroad. This could give rise to non-linearities between, say, withholding and effective corporate taxes. As in Huizinga and Voget (2009) and Barrios *et al.* (2012), these complex second order effects are neglected here. Recent data accounting for this are only available for a set of European countries (see ZEW, 2008).



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  $\omega_{ijt}$  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  $\tau_{jt}$ , measured with the statutory or effective rates, as baseline variables as well as (2) to (5) 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, Hong Kong, Indonesia, Japan, Mexico, Singapore, the US, and South Africa.<sup>14</sup> 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).<sup>15</sup>

## 5 A location choice framework for CBAs

CBAs encapsulate a decision to locate economic activities in a given host country. Therefore, the analysis of this data is conducted within a location choice framework, which models the host country decision embodied in each deal.<sup>16</sup> Specifically, 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

$$\pi_{ijt}^d = (1 - \tau_{ijt}) R(x_{ijt}, \tau_{jt}^o, \delta_i, \delta_j, \delta_t) \quad (6)$$

whose value depends, in turn, on several factors.<sup>17</sup> In particular, as discussed above, firms are thought to be reluctant to invest in the face of high tax rates  $\tau_{ijt}$  levied directly on corporate income, but also other forms of taxation  $\tau_{jt}^o$  accruing, for example, to the value-added component of  $R$ . The control variables are summarised in  $x_{ijt}$ . Year specific components  $\delta_t$  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,  $\delta_i$  and  $\delta_j$  absorb all factors that are specific to, respectively, the source and host countries.

Equation (6) forms the basis for our empirical strategy. However, expected profits  $\pi_{ijt}$  are not directly observable. Therefore, we follow a growing literature (see, for example, Devereux

<sup>14</sup>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.

<sup>15</sup>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.

<sup>16</sup>This paper, therefore, departs from the bulk of the empirical literature which measures the impact of taxes upon aggregate stocks and flows of FDI by means of gravity equations. Though similar variables are employed, it is important to emphasize that the specification of location choice models differs from the standard gravity equations. Above all, location choice models are highly non-linear since they draw on extreme value distributions identifying the best option available. Therefore, the handling of country and time-specific effects differs fundamentally from linear gravity equations.

<sup>17</sup>See Devereux and Griffith (1998) for a similar specifications to modeling the profits of multinationals.

and Griffith, 1998; Buettner and Ruf, 2007; Buettner and Wamser, 2009; Barrios *et al.*, 2012, and Head and Ries, 2008) exploiting the fact that observed CBA deals encapsulate a location choice that identifies the country with the highest expected profit opportunity, that is

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

where  $j'$  denotes alternative hosts where a firm could, in principle, also have made an acquisition. Insofar as taxes affect the profits according to (8), they determine the desirability of multinational firms to bid for foreign firms in various host countries and manifest themselves finally in the market entry decision of  $h_{ijt}^d$ .

The regression equation related with (6) is given by

$$\pi_{ijt}^d = \tilde{x}_{jt}\beta + \tilde{\tau}_{ijt}\gamma + \delta_i + \delta_j + \delta_t + \epsilon_{ijt}, \quad i = 1, \dots, I; j = 1, \dots, J; t = 1, \dots, T, \quad (8)$$

where  $\tilde{x}_{ijt} = \ln(x_{ijt})$  and  $\tilde{\tau}_{ijt} = \ln(\tau_{ijt})$ , and  $\beta$  and  $\gamma$  are coefficients to be estimated, and  $\epsilon_{ijt}$  is a deal-specific error term.

Aside from the details of the tax variables  $\tilde{\tau}_{ijt}$  that have been discussed in the previous section, the set of control variables  $\tilde{x}_{ijt}$  accounts for the established factors to explain the location choices of multinational firms. 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 multinational firm 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, multinational firms 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 multinational firm, 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 as well as the summary statistics for each of the variables are reported in the data appendix.

Head and Ries (2008) have developed a framework to theoretically model the bidding process that occurs when FDI is thought to arise via the international market for corporate control. One of the main ingredients of their approach is that the deal specific component error term  $\epsilon_{ijt}$  is assumed to follow a Gumbel, or type I extreme value distribution, to reflect that the highest bid is going to win in a stylised auction for the control of a foreign target. From

this, it is a short step to see that the probability that a firm of source country  $i$  acquires a target in country  $j$  during year  $t$  takes a multinomial logit form, that is

$$P_{ijt}^d = P_{ijt} = \frac{\exp(\tilde{x}_{ijt}\beta + \tilde{\tau}_{ijt}\gamma + \delta_j)}{\sum_{i=1}^I \sum_{l=1}^M \sum_{t=1}^T \exp(\tilde{x}_{ilt}\beta + \tilde{\tau}_{ilt}\gamma + \delta_j)}. \quad (9)$$

Owing to the exponential nature of (9), the components  $\delta_i$  and  $\delta_t$  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. In other words, location choice approaches obviously exploit the heterogeneity in, say taxes, arising between the locations a multinational firm can potentially choose from.<sup>18</sup>

Though models of the (binary, conditional, and nested) have been used to estimate how corporate taxes impact upon location choices such as  $h_{ijt}^d$  (see, for example, Devereux and Griffith, 1998; Buettner and Ruf, 2007; Buettner and Wamser, 2009; Barrios *et al.*, 2012), their main limitation is the massive number of observations in a sample encompassing a large number of countries and years as we have here. For example, 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. However, the issue that location choice models of the logit class can become very cumbersome to estimate can be avoided by turning to the Poisson regression (Guimarães *et al.*, 2003), which has the advantage of requiring a substantially smaller number of observation to obtain the *same* coefficients (see also ; Schmidheiny and Brühlhart, 2011; Herger and McCorrison, 2013).<sup>19</sup> In this case, the interpretation of the coefficients, such as  $\gamma$ , pertaining to logarithmically transformed coefficients, such as  $\tau_{jt}$ , is that of a constant (tax) elasticity. Appendix C provides the technical details.

The present location choice framework for CBAs has benefits in that it is embedded in the profit function (6) that can be turn connected with theoretical models of FDI and CBAs. However, there are also some limitations. Firstly, the choice is here over the acquisition of a foreign subsidiary and, in the version above, does not contemplate other dimensions such as the difference between mergers and acquisitions and greenfield investment (Becker and Fuest, 2011) or the choice of headquarter (Huizinga and Voget, 2009). Also, firm specific considerations such of profit shifting and tax planning drop out with the deal specific component  $\delta_d$ . Nevertheless, tax effects on location choices by means of CBAs are an important part of international tax competition and the current framework provides a comprehensive and tractable method to estimate the corresponding effects. The next section will turn to the results.

## 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 additional parent country and withholding taxes, Columns 1 and 2 employ statutory tax rates, Columns 3 and 4 effective average tax rates, and Columns 5 and 6 effective marginal tax rates to measure  $\tau_{jt}$ . 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

<sup>18</sup>One should be aware of the deviations from conventional gravity equations. Owing to the non-linear nature, even with time-dummy variables  $\delta_t$ , a time-constant variable can enter the location choice model as long as its values differ across the different options (here host countries  $j$ ).

<sup>19</sup>For a smaller sample with location choices by US multinationals, the exact overlap of the estimated tax effects between the conditional logit model and the Poisson regression is shown in Herger *et al.* (2011).

involves an unbalanced panel with 11,248 observations covering 379 pairs of source countries and years.<sup>20</sup>

Inspection of the results across the six specifications of Table 3 reveals that the coefficients of the control variables 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 protection 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.

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  $\tau_{jt}$ , measured by statutory and effective average rates in Columns 1 to 4, have a negative and significant effect on CBA activity. With the EMTR, an insignificant coefficient arises in Columns 5 and 6. 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.<sup>21</sup> Interestingly, compared with the vast literature on the effect of taxes on FDI, the values of the elasticities are relatively low.

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. Taxes levied on wage payments have no significant effect on the location choices inferred from CBA deals. This result coincides with that of Buettner and Wamser (2009), who attributed this to a scenario where labour is inelastically supplied, and internationally immobile, and as such they bear the labour tax burden.

## 6.2 International tax effects

Table 4 extends the analysis of the impact of taxes upon CBAs by accounting additional parent country and withholding taxes. As discussed in Section 4, multinational firms can be subject to double taxation. Specifically, Columns 1 and 2 of Table 4 consider the effect the international corporate tax burden  $\tau_{ijt}$  that depends, according to equations (2) to (5), on such things as the international tax system, the double tax relief stipulated in bilateral tax treaties, or the withholding tax rate  $\omega_{ijt}$  when repatriating profits from host country  $j$  to parent country  $i$ .

<sup>20</sup>As noted in Section 5 and shown in Appendix C, 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  $j$ .

<sup>21</sup>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 deal value. Furthermore, a preponderance of the aggregate deal values between source and host countries during a given year were zero-valued. This issue could be tackled with either a Tobit regression or a pseudo Poisson maximum likelihood approach. In both cases, when using aggregate deal values, a significant effect did arise with the EMTR. However, as mentioned above, the incompleteness of the value data introduce severe caveats. Therefore, we do not report and discuss these results here.

Table 3: Results for statutory and effective tax rates

Corporate Tax:	Statutory Rate		EATR		EMTR	
	(1)	(2)	(3)	(4)	(5)	(6)
GDP	0.49*** (0.11)	0.48*** (0.11)	0.43*** (0.11)	0.42*** (0.11)	0.39*** (0.11)	0.38*** (0.11)
Net Wage	0.01 (0.03)	0.01 (0.03)	0.01 (0.03)	0.01 (0.03)	0.01 (0.03)	0.01 (0.03)
Distance	-0.62*** (0.01)	-0.62*** (0.01)	-0.62*** (0.01)	-0.62*** (0.01)	-0.62*** (0.01)	-0.62*** (0.01)
Border	0.47*** (0.01)	0.47*** (0.01)	0.47*** (0.01)	0.47*** (0.01)	0.47*** (0.01)	0.47*** (0.01)
Investment Freedom	0.20*** (0.04)	0.18*** (0.04)	0.19*** (0.04)	0.17*** (0.04)	0.19*** (0.04)	0.16*** (0.04)
Trade Freedom	-0.04 (0.07)	-0.04 (0.08)	-0.05 (0.07)	-0.04 (0.08)	-0.05 (0.07)	-0.05 (0.08)
Labour Market Freedom	0.40*** (0.13)	0.33*** (0.13)	0.36*** (0.12)	0.30** (0.13)	0.30** (0.12)	0.24* (0.12)
Shareholder Rights	1.47*** (0.16)	1.45*** (0.16)	1.43*** (0.16)	1.42*** (0.16)	1.37*** (0.16)	1.36*** (0.16)
EU <sub>it</sub> *EU <sub>jt</sub>	-0.51 (0.57)	-0.50 (0.57)	-0.51 (0.57)	-0.50 (0.57)	-0.50 (0.57)	-0.49 (0.57)
(1-EU <sub>it</sub> )*EU <sub>jt</sub>	-0.01 (0.57)	0.001 (0.57)	-0.01 (0.57)	0.001 (0.57)	0.004 (0.57)	0.01 (0.57)
Euro <sub>it</sub> *Euro <sub>jt</sub>	0.27*** (0.06)	0.26*** (0.06)	0.26*** (0.06)	0.26*** (0.06)	0.26*** (0.06)	0.26*** (0.06)
(1-Euro <sub>it</sub> )*Euro <sub>jt</sub>	-0.38*** (0.06)	-0.38*** (0.06)	-0.38*** (0.06)	-0.39*** (0.06)	-0.39*** (0.06)	-0.39*** (0.06)
Exchange Rate	-0.54*** (0.05)	-0.54*** (0.05)	-0.56*** (0.05)	-0.56*** (0.05)	-0.58*** (0.05)	-0.58*** (0.05)
Corporate Tax ( $\tau_{jt}$ ) (Host Country)	-0.21*** (0.06)	-0.22*** (0.06)	-0.17*** (0.06)	-0.17*** (0.06)	-0.04 (0.03)	-0.04 (0.03)
Sales Tax		-0.19*** (0.07)		-0.15** (0.07)		-0.15*** (0.07)
Labour Tax		0.06 (0.05)		0.07 (0.05)		0.07 (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	-26,079	-26,075	-26,081	-26,079	-26,085	-26,082

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  $\alpha_{it}$ . 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  $\delta_j$ . 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  $\alpha_{it}$ , are reported in parentheses. \* Significant at the 10% level; \*\* Significant at the 5% level; \*\*\* Significant at the 1% level.

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.<sup>22</sup> Recall that the international tax burden applies only when profits are repatriated, which is notoriously difficult 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  $\tau_{ijt}$  is more than double the corresponding value of the host country tax  $\tau_{jt}$  used in Table 3. 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.

The remaining columns of Table 4, following Barrios *et al.* (2012), split the international corporate tax burden  $\tau_{ijt}$  into its individual components. Distinguishing again between statutory and effective average rates, together with corporate taxes in the host country  $\tau_{jt}$ , 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 multinational firm 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. A significantly negative effect arises for the additional taxes in the parent country, which is consistent with the findings (but not the magnitude of the coefficients of the corporate tax components: the ones being smaller than in the aggregate cases of Columns (1) and (2)) of Barrios *et al.* (2012, pp.954, 956). The effect of withholding taxes is also significantly negative. The corresponding effect in Barrios *et al.* (2012) is 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  $\bar{V}$  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. The results have been calculated with statutory and effective average corporate tax rates. Furthermore, to account for the role of double taxation, 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).<sup>23</sup>

Some intuitive differences arise with respect to the impact of the control variables when CBAs are driven by different FDI strategies.<sup>24</sup> In particular, as expected, GDP has only

<sup>22</sup>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, for example, tax credits.

<sup>23</sup>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.

<sup>24</sup>To test whether horizontal and vertical deals give rise to different models, the fact that they are strictly non-nested needs taking into account. For this scenario, the likelihood ratio statistic  $LR =$

Table 4: Results with the international tax burden

Corporate Tax:	Statutory EATR		Statutory EATR		Statutory EATR	
	(1)	(2)	(3)	(4)	(5)	(6)
GDP	0.48*** (0.11)	0.44*** (0.11)	0.34*** (0.11)	0.33*** (0.11)	0.28*** (0.12)	0.27*** (0.11)
Net Wage	0.02 (0.03)	0.02 (0.03)	0.01 (0.03)	0.01 (0.03)	-0.003 (0.03)	-0.01 (0.03)
Distance	-0.61*** (0.01)	-0.61*** (0.01)	-0.58*** (0.01)	-0.61*** (0.01)	-0.58*** (0.01)	-0.61*** (0.01)
Border	0.49*** (0.01)	0.49*** (0.01)	0.49*** (0.02)	0.50*** (0.01)	0.49*** (0.02)	0.49*** (0.01)
Investment Freedom	0.16*** (0.04)	0.16*** (0.04)	0.15*** (0.04)	0.15*** (0.04)	0.11*** (0.04)	0.12*** (0.04)
Trade Freedom	-0.03 (0.08)	-0.04 (0.08)	-0.01 (0.08)	-0.04 (0.08)	-0.01 (0.08)	-0.05 (0.08)
Labour Market Freedom	0.35*** (0.13)	0.35*** (0.13)	0.22* (0.13)	0.29** (0.13)	0.20 (0.13)	0.29** (0.13)
Shareholder Rights	1.40*** (0.16)	1.36*** (0.16)	1.26*** (0.17)	1.19*** (0.16)	1.12*** (0.17)	1.04*** (0.16)
$EU_{it} * EU_{jt}$	-0.52 (0.57)	-0.54 (0.57)	-0.50 (0.58)	-0.60 (0.57)	-0.54 (0.58)	-0.65 (0.57)
$(1 - EU_{it}) * EU_{jt}$	0.01 (0.57)	-0.02 (0.57)	0.05 (0.58)	-0.04 (0.57)	0.01 (0.58)	-0.10 (0.57)
$Euro_{it} * Euro_{jt}$	0.27** (0.06)	0.27** (0.06)	0.28*** (0.06)	0.26*** (0.06)	0.28*** (0.06)	0.25*** (0.06)
$(1 - Euro_{it}) * Euro_{jt}$	-0.36*** (0.06)	-0.36*** (0.06)	-0.35*** (0.06)	-0.32*** (0.06)	-0.31*** (0.06)	-0.28*** (0.06)
Exchange Rate	-0.50*** (0.05)	-0.53*** (0.05)	-0.51*** (0.05)	-0.57*** (0.05)	-0.55*** (0.05)	-0.62*** (0.05)
Corporate Tax (International: $\tau_{ijt}$ )	-0.40*** (0.03)	-0.41*** (0.03)				
Corporate Tax (Host: $\tau_{jt}$ )			-0.27*** (0.06)	-0.28*** (0.06)	-0.24*** (0.06)	-0.23*** (0.06)
Corporate Tax (Double: $\tau_{ijt} - \tau_{jt}$ )			-0.12*** (0.01)	-0.14*** (0.01)		
Corporate Tax (Parent: $\tau_{ijt} - \tau_{jt} - (1 - \tau_{jt})\omega_{ijt}$ )					-0.09*** (0.01)	-0.06*** (0.01)
Withholding Tax ( $(1 - \tau_{jt})\omega_{ijt}$ )					-0.15*** (0.01)	-0.17*** (0.01)
Sales Tax	-0.19*** (0.07)	-0.15** (0.07)	-0.17** (0.07)	-0.15** (0.07)	-0.25*** (0.07)	-0.27*** (0.07)
Labour Tax	0.07 (0.05)	0.08 (0.05)	0.06 (0.06)	0.06 (0.05)	0.01 (0.06)	0.01 (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
$\ln L$	-25,979	-26,013	-23,717	-25,838	-23,628	-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  $\alpha_{it}$ . 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  $\delta_j$ . 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  $\alpha_{it}$ , are reported in parentheses. \* Significant at the 10% level; \*\* Significant at the 5% level; \*\*\* Significant at the 1% level.

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.<sup>25</sup> 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 of CBAs, there is some evidence that the effect of corporate taxes is greater on multinational firms pursuing vertical strategy of multinational integration. The tax elasticities are in general more negative for vertical FDI. Furthermore, similar to the result of Table 4, for both horizontal and vertical FDI, corporate taxes matter more when additional parent country and withholding tax issues 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 FDI.

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 FDI 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, multinational firms integrate a foreign plant to produce and sell goods locally such that the sales tax should matter, which is confirmed with the results produced here.

## 6.4 Robustness checks

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

Controlling for the 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

$(1/\sqrt{n}) \sum_{i=1}^n \ln[l(CBA_i^{hor}|x_{ijt}, \tau_{ijt}, \beta^{hor}, \gamma^{hor})/l(CBA_i^{ver}|x_{ijt}, \tau_{ijt}, \beta^{ver}, \gamma^{ver})]/\hat{\omega}^2$ , where  $n$  is the number of observations and  $\hat{\omega}^2 = (1/n) \sum_{i=1}^n \ln[l(CBA_i^{hor}|x_{ijt}, \tau_{ijt}, \beta^{hor}, \gamma^{hor})/l(CBA_i^{ver}|x_{ijt}, \tau_{ijt}, \beta^{ver}, \gamma^{ver})]^2$ , converges to a standard normal distribution (Cameron and Trivedi, 1998, p.184). For all pairs of horizontal and vertical location choice models in Table 5, the value of the corresponding test statistic is slightly higher than 5, which suggests that the models pertaining to horizontal and vertical deals differ statistically in a highly significant manner.

<sup>25</sup>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: Tax Rate: Tax measure:	Purely horizontal cross-border acquisitions				Purely vertical cross-border acquisitions			
	Statutory tax rate		Effective average tax rate		Statutory tax rate		Effective average tax rate	
	Host (1)	International (2)	Host (3)	International (4)	Host (5)	International (6)	Host (7)	International (8)
GDP	0.46* (0.25)	0.51** (0.25)	0.46* (0.25)	0.51** (0.25)	0.13 (0.20)	0.16 (0.20)	0.07 (0.20)	0.10 (0.20)
Net Wage	0.02 (0.06)	0.02 (0.06)	0.02 (0.06)	0.02 (0.06)	-0.03 (0.05)	-0.02 (0.05)	-0.04 (0.05)	-0.03 (0.05)
Distance	-0.66*** (0.02)	-0.65*** (0.02)	-0.66*** (0.02)	-0.65*** (0.02)	-0.58*** (0.01)	-0.57*** (0.01)	-0.58*** (0.01)	-0.57*** (0.01)
Border	0.64*** (0.03)	0.65*** (0.03)	0.64*** (0.03)	0.65*** (0.03)	0.36*** (0.03)	0.39*** (0.03)	0.36*** (0.03)	0.38*** (0.03)
Investment Freedom	0.01 (0.09)	0.01 (0.09)	0.01 (0.09)	0.01 (0.09)	0.09 (0.10)	0.08 (0.09)	0.09 (0.07)	0.08 (0.09)
Trade Freedom	-0.37* (0.21)	-0.36* (0.21)	-0.37* (0.21)	-0.36* (0.21)	0.14 (0.14)	0.16 (0.14)	0.13 (0.14)	0.14 (0.14)
Labour Market Fd	-0.03 (0.30)	0.04 (0.29)	-0.02 (0.30)	0.05 (0.29)	0.56** (0.23)	0.61*** (0.23)	0.51** (0.24)	0.57** (0.23)
Shareholder Rights	0.79** (0.37)	0.83*** (0.36)	0.86** (0.37)	0.82*** (0.36)	1.27*** (0.31)	1.25*** (0.30)	1.20*** (0.31)	1.19*** (0.30)
EU <sub>it</sub> *EU <sub>jt</sub>	1.02 (2.29)	0.97 (2.26)	1.01 (2.29)	0.96 (2.26)	1.08 (1.62)	1.01 (1.59)	1.09 (1.62)	1.02 (1.60)
(1-EU <sub>it</sub> )*EU <sub>jt</sub>	1.75 (2.29)	1.70 (2.26)	1.75 (2.29)	1.69 (2.26)	1.65 (1.62)	1.59 (1.59)	1.65 (1.62)	1.60 (1.60)
Euro <sub>it</sub> *Euro <sub>jt</sub>	0.24** (0.12)	0.25*** (0.12)	0.24** (0.12)	0.25** (0.12)	0.36*** (0.12)	0.37*** (0.12)	0.35*** (0.12)	0.36*** (0.12)
(1-Euro <sub>it</sub> )*Euro <sub>jt</sub>	-0.51*** (0.12)	-0.49*** (0.12)	-0.51*** (0.12)	-0.49*** (0.12)	-0.38*** (0.12)	-0.36*** (0.12)	-0.39*** (0.12)	-0.36*** (0.12)
Exchange Rate	-0.54*** (0.12)	-0.49*** (0.11)	-0.54*** (0.11)	-0.50*** (0.11)	-0.61*** (0.10)	-0.55*** (0.09)	-0.64*** (0.09)	-0.60*** (0.09)
Corporate Tax	-0.01 (0.13)	-0.23*** (0.06)	-0.01 (0.13)	-0.27*** (0.08)	-0.20* (0.11)	-0.45*** (0.05)	-0.09 (0.10)	-0.38*** (0.06)
Sales Tax	-0.61*** (0.17)	-0.64*** (0.17)	-0.62*** (0.17)	-0.62*** (0.17)	-0.16 (0.13)	-0.16 (0.13)	-0.12 (0.13)	-0.12 (0.13)
Labour Tax	0.11 (0.13)	0.11 (0.13)	0.11 (0.13)	0.11 (0.12)	-0.05 (0.10)	-0.04 (0.10)	-0.04 (0.10)	-0.03 (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	-10,084	-10,077	-10,084	-10,078	-12,840	-12,804	-12,842	-12,825

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  $\alpha_{it}$ . 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  $\delta_j$ . The data cover purely horizontal or vertical CBAs (defined according to  $\bar{V} = 5\%$ ). #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  $\alpha_{it}$ , are reported in parentheses. \* Significant at the 10% level; \*\* Significant at the 5% level; \*\*\* Significant at the 1% level.

foreign business have been found to affect FDI (see, for example, Daude and Stein, 2007). To comprehensively account for the plethora of institutional quality variables, we have also 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  $\alpha_{it}$  that absorb any variable that does not differ across host countries.<sup>26</sup> 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  $\alpha_{it}$  has also the advantage of eliminating the issue as to whether the explanatory variables need transforming into logarithmic *differences*. For taxes, both the levels (Buettner and Ruf, 2007) and differences (Huizinga and Voget, 2009) have been used. However, since the fixed effect  $\alpha_{it}$  absorbs all source and year specific heterogeneity, the same coefficient estimates arise when the tax burden is expressed in (log) levels of a host country or the corresponding (log) difference between source and host country.

Our data also cover some of the years, during which the global economy witnessed the extraordinary events of the global financial crisis. Though it is still too early to assess whether this has led to structural shifts in the international market for corporate control, we have calculated our results for the period 1999 to 2007 only. Again, this did not affect the main conclusions above.

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  $\bar{V}$  to define vertical relatedness. Changing the vertical relatedness benchmark reallocates the proportion of CBAs between the horizontal and vertical strategies (see Section 3). The results with the alternative values for  $\bar{V}$  are reported in Appendix Tables 5a and 5b. Table 5a relate to an increase of  $\bar{V}$  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  $\bar{V}$  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. Finally, the difference between horizontal and vertical FDI pertains perhaps more to the manufacturing sector, where production processes can be replicated locally or our-sourced, rather than services. However, recalculating Table 5 for the manufacturing sector only did not change the essence of the results.

## 6.5 Summary of tax elasticities

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

<sup>26</sup>The dummy variables  $\delta_j$  further account for any specific variable shifting the intercept of the host country.

to 5, the range with the highest and lowest values of the results is reported. A relatively consistent picture arises where the corporate tax elasticity on FDI is around  $-2/5$  when profits are repatriated. 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 higher for vertical CBAs. Finally, the sales tax elasticity is around  $-1/5$  with substantially higher effects of up to  $-2/3$  for FDI driven by a horizontal strategy whilst the effect is insignificant and close to zero for vertical FDI.

Table 6: **Overview of tax elasticities**

	All CBAs	Horizontal CBAs	Vertical CBAs
<b>Corporate tax measured by statutory rate</b>			
<b>International tax</b>	-0.40	-0.23	-0.45
Host country tax	-0.21 to -0.27	<i>-0.01</i>	-0.20
Source country tax	-0.09		
Withholding tax	-0.15		
<b>Corporate tax measured by EATR</b>			
<b>International tax</b>	-0.41	-0.27	-0.38
Host country tax	-0.17 to -0.28	<i>-0.01</i>	<i>-0.09</i>
Source country tax	-0.06		
Withholding tax	-0.17		
<b>Sales tax</b>			
Sales tax	-0.15 to -0.27	-0.61 to -0.64	<i>-0.12 to -0.16</i>

Notes: This table provides an overview of the measured tax elasticities according to (12) across the results reported in Tables 3 to 5. For all contingencies the maximum and minimum value is reported. Insignificant coefficients are marked by *italic* letters.

Though our results coincide with the broadly shared view that taxes reduce the incentive of multinational firms to undertake foreign direct investment (FDI), there is substantial variation in the estimates of the corresponding tax elasticities. For example, for taxes levied directly on corporate profits, elasticities between 0 to -5 percent have been found (see De Mooij and Ederveen (2003, 2008) for an overview). But, as we show here, the impact of taxes depends on the characteristics of international taxation and it also varies across different forms of FDI. In addition, sales taxes impact on horizontal but not vertical FDI. Overall, the implications of the above range of tax elasticities is that changing direct and indirect taxes or amending details associated with international taxation will not only affect the overall level of FDI but impact on the composition between horizontal and vertical FDI.

## 7 Summary

Attracting FDI can be a goal for policy-makers and taxes provide an 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. For a large sample with more than 80,000 cross-border acquisitions (CBAs), between 30 major countries during 1999 to 2010 period, which reflects—to the best of our knowledge—the most comprehensive study on the effect of taxes upon host country choices encapsulated in CBA deals, the key insights that arise from this paper can be summarised as follows:

- 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  $-1/20$  and  $-9/20$  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 FDI.
- iv. For the case of sales taxes, the effect arises primarily with FDI 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 FDI, which involve subsidiaries producing export goods, on which the sales tax can normally be reimbursed at the border.

There are two broad policy conclusions that could be derived from our results. First, while confirming that taxes have a negative impact on FDI, the results suggest a more nuanced interpretation as the effects of taxes will depend not only on the details of the international tax system, but also on the nature of the FDI strategies which, in turn, depends on the factors that drive these decisions. Rather than asking about *the* effect of corporate taxes on multinational firms, it seems important to recognise that the reactions, for example within the international market for corporate control, can be rather versatile. Second, insofar as the issue of fiscal devaluation gathers pace involving greater use of value added taxes, this may impact on FDI but will be contingent on the motivations for FDI.

The role of taxation within a globalised economy that is largely organised around multinational enterprises (MNEs) remains high on the policy agenda. Several on-going debates focus on a number of issues such as tax base erosion, international tax competition, how to deal with double taxation, transfer pricing, or headquarter inversion to reduce the corporate tax burden. Within the tax and public finance literature, there is indeed a broad consensus that taxes affect the decision of MNEs to invest in a given country. Though this study confirms this finding for a large number of cross border acquisitions, one of the key findings is that tax effects are cumbersome since firms pursue different strategies and various taxes arise. Further differences that have not been considered here are those between industries and firms that might give rise to even more heterogeneity. These, and many other issues, seem to leave ample scope for additional theoretical and empirical research on the interconnections between taxes and CBAs.

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# Appendices

## Appendix A: Country coverage and summary statistics

### 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).

### Summary statistics of the raw data

	CBA	GDP	Net Wage	Distance	Border	Invest. Freed.	Trade Freed.	Labour Freed.	Sharehol- der Righ.	EU*EU
Mean	7.10	9.8e+11	2.16	6.81	0.05	67.90	78.45	65.76	3.03	0.23
Std	25.77	2.0e+12	3.88	5.09	0.23	14.64	8.26	16.44	1.38	0.42
Min	0	5.0e+10	0.01	0.06	0	30	24	37	0	0
Max	513	1.2e+13	84.74	19.84	1	95	90	100	5	1
	(1-EU) *EU	EURO* EURO	(1-EURO) *EURO	Exchange Rate		Corporate Tax		Sales Tax	Labour Tax	
						Statutory	EATR	EMTR		
Mean	0.23	0.11	0.24	1.05	30.90	27.50	18.39	16.49	24.63	
Std	0.42	0.32	0.43	0.55	6.72	5.68	5.42	5.48	8.062	
Min	0	0	0	0.16	10	8.63	4.78	5	8	
Max	1	1	1	4.70	51.56	43.77	32.44	25	46	



## Appendix B: Data Description and Additional Results

Variable	Description	Source
<b>Dependent Variable:</b>		
$n_{ijt}$	Number of cross border acquisition deals between the source country $i$ and host country $j$ during year $t$ .	Compiled .
<b>Tax Variables</b>		
Corporate Tax (Statutory)	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 as published in the Prices and Earnings survey of UBS. For the first part of our sample, the Prices and Earnings survey is only published triennially. Values of the missing years have been filled with the closest observation available. In particular, the values of the years 1999 and 2001 employ the 2000 data, the values for the years 2002 and 2004 employ the 2003 data, and the values for the years 2005 and 2007 employ the 2006 data. Since 2008 yearly updates of the Prices and Earnings survey are available.	UBS, Prices and Earnings. See also Braconier <i>et al.</i> (2005).
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.
<b>Control Variables:</b>		
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 as published in the Prices and Earnings survey of UBS. 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. For the first part of our sample, the Prices and Earnings survey is only published triennially. Values of the missing years have been filled with the closest observation available. In particular, the values of the years 1999 and 2001 employ the 2000 data, the values for the years 2002 and 2004 employ the 2003 data, and the values for the years 2005 and 2007 employ the 2006 data. Since 2008 yearly updates of the Prices and Earnings survey are available.	UBS, Prices and Earnings. See also Braconier <i>et al.</i> (2005).
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 <i>et al.</i> (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: Tax rate: Tax measure:	Purely horizontal cross-border acquisitions			Purely vertical cross-border acquisitions				
	Host (1)	International (2)	Host (3)	EATR (4)	International (5)	Host (6)	International (7)	EATR (8)
GDP	0.40** (0.19)	0.44** (0.18)	0.39** (0.18)	0.41** (0.18)	0.26 (0.31)	0.25 (0.31)	0.22 (0.31)	0.23 (0.31)
Net Wage	0.005 (0.05)	0.02 (0.05)	0.004 (0.05)	0.01 (0.05)	0.01 (0.09)	0.01 (0.09)	0.01 (0.07)	0.01 (0.09)
Distance	-0.65*** (0.01)	-0.64*** (0.01)	-0.65*** (0.01)	-0.64*** (0.01)	-0.57*** (0.02)	-0.56*** (0.02)	-0.57*** (0.02)	-0.56*** (0.02)
Border	0.63*** (0.02)	0.64*** (0.02)	0.63*** (0.02)	0.64*** (0.02)	0.02 (0.05)	0.04 (0.05)	0.02 (0.05)	0.04 (0.05)
Investment Freedom	0.13* (0.07)	0.12* (0.07)	0.13* (0.07)	0.12* (0.07)	0.06 (0.12)	0.05 (0.12)	0.06 (0.12)	0.05 (0.08)
Trade Freedom	0.05 (0.14)	0.06 (0.14)	0.04 (0.14)	0.04 (0.14)	0.13 (0.20)	0.14 (0.20)	0.13 (0.20)	0.13 (0.20)
Labour Market Fd	0.002 (0.22)	0.05 (0.21)	0.01 (0.22)	-0.001 (0.003)	0.58 (0.37)	0.59 (0.36)	0.56 (0.37)	0.58 (0.36)
Shareholder Rights	1.26** (0.25)	1.26** (0.27)	1.27** (0.28)	1.24*** (0.27)	1.26*** (0.47)	1.22*** (0.46)	1.25*** (0.45)	1.21*** (0.46)
EU <sub>it</sub> *EU <sub>jt</sub>	-0.99 (0.72)	-1.01 (0.72)	-1.00 (0.72)	-1.02 (0.72)	0.47 (2.00)	0.44 (1.98)	0.47 (2.99)	0.43 (1.99)
(1-EU <sub>it</sub> )*EU <sub>jt</sub>	-0.23 (0.72)	-0.24 (0.72)	-0.23 (0.72)	-0.25 (0.72)	0.82 (2.00)	0.80 (1.98)	0.83 (2.00)	0.79 (1.99)
Euro <sub>it</sub> *Euro <sub>jt</sub>	0.20** (0.09)	0.20** (0.09)	0.20** (0.09)	0.20** (0.09)	0.50*** (0.19)	0.51*** (0.19)	0.51*** (0.19)	0.51*** (0.19)
(1-Euro <sub>it</sub> )*Euro <sub>jt</sub>	-0.49*** (0.09)	-0.46*** (0.09)	-0.49*** (0.09)	-0.46*** (0.09)	-0.40** (0.19)	-0.38* (0.19)	-0.39* (0.19)	-0.37* (0.20)
Exchange Rate	-0.59*** (0.08)	-0.55*** (0.08)	-0.60*** (0.08)	-0.57*** (0.08)	-0.44*** (0.15)	-0.42*** (0.09)	-0.45*** (0.14)	-0.44*** (0.14)
Corporate Tax	-0.10 (0.09)	-0.33*** (0.05)	-0.12 (0.09)	-0.30*** (0.06)	-0.16 (0.17)	-0.27*** (0.08)	-0.13 (0.17)	-0.30*** (0.10)
Sales Tax	-0.27*** (0.12)	-0.29** (0.12)	-0.25** (0.12)	-0.27** (0.12)	-0.37* (0.20)	-0.36* (0.20)	-0.34* (0.20)	-0.34* (0.20)
Labour Tax	0.03 (0.09)	0.04 (0.09)	0.04 (0.09)	0.05 (0.09)	-0.01 (0.15)	-0.01 (0.15)	0.003 (0.15)	0.002 (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	-13,793	-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  $\alpha_{it}$ . 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  $\delta_j$ . The data cover purely horizontal or vertical CBAs (defined according to  $\bar{V} = 10\%$ ). #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  $\alpha_{it}$ , are reported in parentheses. \* 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: Tax rate: Tax measure:	Purely horizontal cross-border acquisitions				Purely vertical cross-border acquisitions			
	Statutory tax rate		Effective average tax rate		Statutory tax rate		Effective average tax rate	
	Host (1)	International (2)	Host (3)	International (4)	Host (5)	International (6)	Host (7)	International (8)
GDP	-0.07 (0.41)	-0.01 (0.40)	-0.08 (0.40)	-0.03 (0.40)	0.28* (0.15)	0.30* (0.14)	0.23 (0.14)	0.26* (0.14)
Net Wage	0.02	0.03	0.02	0.02	0.002	0.01	-0.001	0.004
Distance	(0.10)	(0.10)	(0.10)	(0.10)	(0.04)	(0.04)	(0.04)	(0.04)
Border	-0.70*** (0.03)	-0.69*** (0.03)	-0.70*** (0.03)	-0.69*** (0.03)	-0.61*** (0.01)	-0.60*** (0.01)	-0.61*** (0.01)	-0.60*** (0.01)
Investment Freedom	0.68*** (0.05)	0.70*** (0.05)	0.68*** (0.05)	0.69*** (0.05)	0.44*** (0.01)	0.46*** (0.02)	0.44*** (0.02)	0.46*** (0.02)
Trade Freedom	0.05 (0.15)	0.05 (0.15)	0.05 (0.15)	0.05 (0.15)	0.23*** (0.05)	0.22*** (0.05)	0.23*** (0.05)	0.22*** (0.05)
Labour Market Fd	-0.12 (0.34)	-0.11 (0.34)	-0.13 (0.34)	-0.12 (0.34)	0.05 (0.10)	0.06 (0.10)	0.04 (0.09)	0.05 (0.10)
Shareholder Rights	-0.45 (0.47)	-0.36 (0.36)	-0.46 (0.47)	-0.39 (0.47)	0.42*** (0.17)	0.47*** (0.17)	0.46*** (0.17)	0.45*** (0.16)
EU*EU <sub>jt</sub>	-0.01 (0.61)	0.03 (0.60)	-0.02 (0.61)	0.01 (0.60)	1.37*** (0.22)	1.34*** (0.22)	1.34*** (0.22)	1.36*** (0.22)
(1-EU <sub>it</sub> )*EU <sub>jt</sub>	-11.46 (11.43)	-11.45 (11.43)	-11.46 (11.44)	-11.45 (11.47)	0.15 (0.93)	0.12 (0.92)	0.15 (0.93)	0.11 (0.92)
Euro <sub>it</sub> *Euro <sub>jt</sub>	-12.14 (11.43)	-12.13 (11.43)	-12.14 (11.44)	-12.13 (11.47)	0.67 (0.93)	0.65 (0.92)	0.68 (0.93)	0.65 (0.92)
(1-Euro <sub>it</sub> )*Euro <sub>jt</sub>	0.56** (0.18)	0.56** (0.18)	0.56** (0.18)	0.56** (0.18)	0.24*** (0.08)	0.24*** (0.08)	0.24*** (0.08)	0.24*** (0.08)
Exchange Rate	-0.21 (0.18)	-0.19 (0.18)	-0.21 (0.18)	-0.19 (0.19)	-0.42*** (0.08)	-0.39*** (0.08)	-0.42*** (0.08)	-0.39*** (0.08)
Corporate Tax	-0.30*** (0.18)	-0.26*** (0.18)	-0.31*** (0.18)	-0.28*** (0.18)	-0.59*** (0.07)	-0.54*** (0.07)	-0.61*** (0.07)	-0.58*** (0.06)
Sales Tax	-0.03 (0.20)	-0.31*** (0.10)	-0.01 (0.20)	-0.29** (0.13)	-0.18** (0.08)	-0.41*** (0.04)	-0.13 (0.05)	-0.39*** (0.10)
Labour Tax	-0.47* (0.28)	-0.51* (0.27)	-0.46* (0.27)	-0.48* (0.27)	0.03 (0.10)	0.04 (0.10)	0.07 (0.10)	0.07 (0.10)
#cba	0.36 (0.20)	0.36 (0.20)	0.36* (0.20)	0.37* (0.19)	-0.09 (0.07)	-0.08 (0.07)	-0.08 (0.07)	-0.07 (0.07)
#obs	6,373	6,373	6,373	6,373	46,874	46,874	46,874	46,874
ln L	11,248	11,248	11,248	11,248	11,248	11,248	11,248	11,248
	-5,778	-5,774	-5,779	-5,776	-18,738	-18,679	-18,740	-18,705

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  $\alpha_{it}$ . 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  $\delta_j$ . The data cover purely horizontal or vertical CBAs (defined according to  $\bar{V} = 1\%$ ). #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  $\alpha_{it}$ , are reported in parentheses. \* Significant at the 10% level; \*\* Significant at the 5% level; \*\*\* Significant at the 1% level.

## Appendix C: On the choice of the Poisson regression

Econometric models that are capable to handle location choices include the conditional logit model, where  $h_{ijt}^d$  is the dependent variable. The conditional logit models takes 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  $\ln L_{cl} = \sum_{d=1}^D \sum_{i=1}^I \sum_{j=1}^J \sum_{t=1}^T \ln(P_{ijt}^d)$  with  $P_{ijt}^d$  defined by (9). Since  $P_{ijt}^d = P_{ijt}$ , 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 (9) yields

$$\begin{aligned} \ln L_{cl} &= \sum_{i=1}^I \sum_{j=1}^J \sum_{t=1}^T n_{ijt} (\tilde{x}_{ijt}\beta + \tilde{\tau}_{ijt}\gamma + \delta_j) \\ &\quad - \sum_{i=1}^I \sum_{j=1}^J \sum_{t=1}^T \left[ n_{ijt} \ln \left( \sum_{i=1}^I \sum_{j=1}^J \sum_{t=1}^T \exp(\tilde{x}_{ijt}\beta + \tilde{\tau}_{ijt}\gamma + \delta_j) \right) \right], \end{aligned} \quad (10)$$

from which the coefficients  $\beta$  and  $\gamma$  can be estimated.

In practice, a caveat against the conditional logit model is that it can require massive amounts of data for estimation. 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  $Prob[n = n_{ijt}] = [\exp(-\lambda_{ijt})\lambda_{ijt}^{n_{ijt}}]/n_{ijt}!$  whilst an exponential mean transformation connects the Poisson parameter  $\lambda_{ijt}$  with the explanatory variables of (8), that is  $E[n_{ijt}] = \lambda_{ijt} = \exp(\tilde{x}_{ijt}\beta + \tilde{\tau}_{ijt}\gamma + \delta_i + \delta_j + \delta_t) = \alpha_{it} \exp(\tilde{x}_{jt}\beta + \tilde{\tau}_{ijt}\gamma + \delta_j)$ . 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  $\alpha_{it}$ , equals

$$\begin{aligned} \ln L_{pc} &= \sum_{i=1}^I \sum_{j=1}^J \sum_{t=1}^T n_{ijt} (\tilde{x}_{ijt}\beta + \tilde{\tau}_{ijt}\gamma + \delta_j) \\ &\quad - \sum_{i=1}^I \sum_{j=1}^J \sum_{t=1}^T \left[ n_{ijt} \ln \left( \sum_{i=1}^I \sum_{j=1}^J \sum_{t=1}^T \exp(\tilde{x}_{ijt}\beta + \tilde{\tau}_{ijt}\gamma + \delta_j) \right) \right] + C. \end{aligned} \quad (11)$$

Since (11) differs from (10) only as regards the constant  $C$ , the estimates of  $\beta$  and  $\gamma$  of a Poisson regression and a conditional logit model are identical!

Owing to different asymptotic assumptions, in small samples, the standard deviations can differ between the logit model and the Poisson regression. However, Schmidheiny and Brühlhart (2011, p.219) show that clustering at the group level  $\alpha_{it}$  yields asymptotically identical standard errors. For our case with thousands of count variables that reflect many more location choices embodied in CBA deals, these asymptotic properties are likely to hold as long as the standard errors are appropriately clustered.

As long as the variables are transformed into logarithms, the coefficients ( $\beta$  and  $\gamma$ ) 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  $\eta$ , given by

$$\eta = \frac{\partial E[n_{ijt}]}{\partial \tau_{ijt}} \frac{\tau_{ijt}}{E[n_{ijt}]} = \gamma, \quad (12)$$

is constant.<sup>27</sup>

<sup>27</sup>Though the coefficient estimates are identical, Schmidheiny and Brühlhart (2011) observe that the elasticities differ between the Poisson regression and the conditional logit model. In particular, the tax elasticity of the conditional logit model, which is  $\eta_{ijt}^{cl} = (1 - P_{ijt})\gamma$ , cannot be larger than (12). 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.

# Reviewers Appendix

THIS APPENDIX IS FOR THE ATTENTION OF REFEREES AND NOT FOR PUBLICATION

## Results for statutory and effective tax rates

Corporate tax:	Statutory rate		EATR		EMTR	
	(1)	(2)	(3)	(4)	(5)	(6)
GDP	0.37*** (0.10)	0.37*** (0.10)	0.33*** (0.10)	0.32*** (0.10)	0.30*** (0.10)	0.29*** (0.10)
Net Wage	0.02 (0.03)	0.03 (0.03)	0.03 (0.03)	0.02 (0.03)	0.03 (0.03)	0.02 (0.03)
Distance	-0.62*** (0.01)	-0.62*** (0.01)	-0.62*** (0.01)	-0.62*** (0.01)	-0.62*** (0.01)	-0.62*** (0.01)
Border	0.47*** (0.01)	0.47*** (0.01)	0.47*** (0.01)	0.47*** (0.01)	0.47*** (0.01)	0.47*** (0.01)
Economic Freedom	0.44*** (0.15)	0.30** (0.15)	0.42*** (0.15)	0.30* (0.15)	0.41*** (0.15)	0.41*** (0.16)
Shareholder Rights	1.47*** (0.13)	1.45*** (0.14)	1.44*** (0.13)	1.40*** (0.13)	1.40*** (0.13)	1.34*** (0.13)
$EU_{it} * EU_{jt}$	-0.49 (0.61)	-0.48 (0.57)	-0.49 (0.57)	-0.48 (0.57)	-0.48 (0.57)	-0.47 (0.57)
$(1 - EU_{it}) * EU_{jt}$	0.01 (0.61)	0.03 (0.57)	-0.01 (0.57)	0.03 (0.57)	0.02 (0.57)	0.03 (0.57)
$Euro_{it} * Euro_{jt}$	0.28*** (0.06)	0.27*** (0.06)	0.27*** (0.06)	0.26*** (0.06)	0.27*** (0.06)	0.26*** (0.06)
$(1 - Euro_{it}) * Euro_{jt}$	-0.38*** (0.06)	-0.38*** (0.06)	-0.37*** (0.06)	-0.38*** (0.06)	-0.37*** (0.06)	-0.38*** (0.06)
Exchange Rate	-0.53*** (0.05)	-0.53*** (0.05)	-0.54*** (0.05)	-0.55*** (0.05)	-0.56*** (0.05)	-0.56*** (0.05)
Corporate Tax ( $\tau_{jt}$ ) (Host Country)	-0.13** (0.05)	-0.18*** (0.06)	-0.11* (0.06)	-0.13** (0.06)	-0.04 (0.03)	-0.04 (0.03)
Sales Tax		-0.28*** (0.07)		-0.25** (0.07)		-0.23*** (0.07)
Labour Tax		0.09 (0.05)		0.09 (0.05)		0.09 (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  $\alpha_{it}$ . 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  $\delta_j$ . 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  $\alpha_{it}$ , 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*** (0.10)	0.35*** (0.10)	0.26** (0.10)	0.24** (0.10)	0.25** (0.10)	0.22** (0.10)
Net Wage	0.04 (0.03)	0.02 (0.03)	0.02 (0.03)	0.01 (0.03)	0.01 (0.03)	-0.01 (0.03)
Distance	-0.61*** (0.01)	-0.61*** (0.01)	-0.58*** (0.01)	-0.61*** (0.01)	-0.58*** (0.01)	-0.61*** (0.01)
Border	0.49*** (0.01)	0.49*** (0.01)	0.49*** (0.02)	0.50*** (0.01)	0.49*** (0.02)	0.49*** (0.01)
Economic Freedom	0.25* (0.15)	0.22 (0.15)	0.39** (0.16)	0.31** (0.15)	0.43*** (0.16)	0.36** (0.15)
Shareholder Rights	1.46*** (0.13)	1.41*** (0.13)	1.22*** (0.14)	1.19*** (0.13)	1.11*** (0.14)	1.07*** (0.14)
$EU_{it} * EU_{jt}$	-0.50 (0.57)	-0.51 (0.57)	-0.48 (0.58)	-0.58 (0.57)	-0.53 (0.58)	-0.64 (0.57)
$(1 - EU_{it}) * EU_{jt}$	0.01 (0.57)	0.001 (0.57)	0.07 (0.58)	-0.02 (0.57)	0.01 (0.58)	-0.09 (0.57)
$Euro_{it} * Euro_{jt}$	0.27** (0.06)	0.27** (0.06)	0.28*** (0.06)	0.26*** (0.06)	0.28*** (0.06)	0.26*** (0.06)
$(1 - Euro_{it}) * Euro_{jt}$	-0.36*** (0.06)	-0.35*** (0.06)	-0.34*** (0.06)	-0.32*** (0.06)	-0.30*** (0.06)	-0.28*** (0.06)
Exchange Rate	-0.49*** (0.05)	-0.52*** (0.05)	-0.50*** (0.05)	-0.56*** (0.05)	-0.55*** (0.05)	-0.61*** (0.05)
Corporate Tax (International: $\tau_{ijt}$ )	-0.40*** (0.03)	-0.40*** (0.03)				
Corporate Tax (Host: $\tau_{jt}$ )			-0.23*** (0.06)	-0.24*** (0.05)	-0.20*** (0.06)	-0.19*** (0.06)
Corporate Tax (Double: $\tau_{ijt} - \tau_{jt}$ )			-0.12*** (0.01)	-0.14*** (0.01)		
Corporate Tax (Parent: $\tau_{ijt} - \tau_{jt} - (1 - \tau_{jt})\omega_{ijt}$ )					-0.09*** (0.01)	-0.06*** (0.01)
Withholding Tax ( $(1 - \tau_{jt})\omega_{ijt}$ )					-0.15*** (0.01)	-0.17*** (0.01)
Sales Tax	-0.29*** (0.07)	-0.26** (0.06)	-0.22** (0.07)	-0.24** (0.07)	-0.27*** (0.07)	-0.33*** (0.07)
Labour Tax	0.10** (0.05)	0.11** (0.05)	0.08 (0.06)	0.01 (0.05)	0.03 (0.06)	0.04 (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  $\alpha_{it}$ . 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  $\delta_j$ . 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  $\alpha_{it}$ , 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: Tax rate: Tax measure:	Purely horizontal cross-border acquisitions				Purely vertical cross-border acquisitions			
	Host (1)	International (2)	Host (3)	International (4)	Host (5)	International (6)	Host (7)	International (8)
GDP	0.31 (0.23)	0.37* (0.22)	0.31 (0.22)	0.36* (0.22)	0.28 (0.19)	0.36** (0.18)	0.23 (0.18)	0.29 (0.18)
Net Wage	0.02 (0.06)	0.02 (0.06)	0.02 (0.06)	0.02 (0.06)	-0.03 (0.05)	-0.01 (0.05)	-0.03 (0.05)	-0.02 (0.05)
Distance	-0.66*** (0.02)	-0.65*** (0.02)	-0.66*** (0.02)	-0.65*** (0.02)	-0.58*** (0.01)	-0.57*** (0.01)	-0.58*** (0.01)	-0.57*** (0.01)
Border	0.64*** (0.03)	0.65*** (0.03)	0.64*** (0.03)	0.65*** (0.03)	0.36*** (0.03)	0.39*** (0.03)	0.36*** (0.03)	0.38*** (0.03)
Economic Freedom	-0.37 (0.35)	-0.43 (0.35)	-0.38 (0.35)	-0.46 (0.35)	1.12*** (0.29)	1.04*** (0.28)	1.16*** (0.29)	1.05*** (0.28)
Shareholder Rights	0.74** (0.30)	0.82*** (0.28)	0.76** (0.30)	0.82*** (0.28)	1.52*** (0.26)	1.61*** (0.25)	1.42*** (0.26)	1.53*** (0.24)
EU <sub>it</sub> *EU <sub>jt</sub>	1.02 (2.29)	0.97 (2.26)	1.02 (2.30)	0.96 (2.26)	1.09 (1.63)	1.01 (1.59)	1.11 (1.63)	1.02 (1.61)
(1-EU <sub>it</sub> )*EU <sub>jt</sub>	1.76 (2.29)	1.71 (2.26)	1.75 (2.30)	1.70 (2.26)	1.65 (1.63)	1.59 (1.59)	1.67 (1.63)	1.60 (1.61)
Euro <sub>it</sub> *Euro <sub>jt</sub>	0.24** (0.12)	0.24*** (0.12)	0.24** (0.12)	0.24** (0.12)	0.37*** (0.12)	0.38*** (0.12)	0.36*** (0.12)	0.37*** (0.12)
(1-Euro <sub>it</sub> )*Euro <sub>jt</sub>	-0.51*** (0.12)	-0.49*** (0.12)	-0.51*** (0.12)	-0.49*** (0.12)	-0.38*** (0.12)	-0.35*** (0.12)	-0.38*** (0.12)	-0.35*** (0.12)
Exchange Rate	-0.53*** (0.12)	-0.49*** (0.11)	-0.52*** (0.11)	-0.50*** (0.11)	-0.51*** (0.09)	-0.55*** (0.09)	-0.63*** (0.09)	-0.59*** (0.09)
Corporate Tax	-0.01 (0.13)	-0.23*** (0.06)	-0.03 (0.13)	-0.28*** (0.08)	-0.10 (0.10)	-0.44*** (0.05)	-0.02 (0.10)	-0.35*** (0.06)
Sales Tax	-0.67*** (0.17)	-0.70*** (0.16)	-0.67*** (0.16)	-0.69*** (0.16)	-0.13 (0.13)	-0.17 (0.13)	-0.10 (0.13)	-0.13 (0.13)
Labour Tax	0.11 (0.13)	0.11 (0.12)	0.11 (0.13)	0.12 (0.12)	-0.01 (0.10)	-0.001 (0.09)	-0.01 (0.10)	0.05 (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  $\alpha_{it}$ . 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  $\delta_j$ . The data cover purely horizontal or vertical CBAs (defined according to  $\bar{V} = 5\%$ ). #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  $\alpha_{it}$ , are reported in parentheses. \* Significant at the 10% level; \*\* Significant at the 5% level; \*\*\* Significant at the 1% level.