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Taxes and the Location of Targets*

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Abstract

We use firm-level data to investigate the impact of taxes on the international location of targets in M&A allowing for heterogeneous responses by companies. The statutory tax rate in the target country is found to have a negative impact on the probability of an acquisition in that country. In addition, the estimated size of the effect is found to depend on whether (i) acquirer is a domestic or a multinational enterprise; (ii) the acquisition is domestic or cross-border; and (iii) the acquirer's country has a worldwide or territorial tax system.

JEL Classification : G34, H25, H32, C25

Keywords: Multinational enterprises, cross-border expansion, target choice, corporation income tax, mixed logit.

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1 Introduction

The growth of international cross-border mergers and acquisitions (M&A) over the last two decades is well documented. The UNCTAD 2015 World Investment Report states that globally, the total value of cross-border M&A sales, at 2014 prices, rose from around $98 billion in 1990 to $399 billion in 2014. This was not a steady increase: during that period there were two major waves, peaking at $960 million in 2000 and just over $1 trillion in 2007 prior to the financial crises of 2008, when it dipped to $288 billion in 2009. The importance of cross-border M&A can be seen in the context of total M&A, and in the context of total cross-border investment. Erel et al. (2012) report that the percentage of all M&A accounted for by cross-border deals rose from 23% in 1998 to 45% in 2007. And, according to UNCTAD FDI data, the percentage of all foreign direct investment that took the form of cross-border mergers and acquisitions rose from 29% in 1991 to over 48% by 2007. Following the financial crash, it has since declined to 26% in 2009, but in several recent years the proportion has been well in excess of 50%.[1]

This paper examines primarily the impact of corporate taxation on the *choice* of the *location* of a target company by a potential acquirer, controlling for other determinants of this choice.[2] There is a very large literature on the impact of taxes on FDI. Surveys and meta-analyses include de Mooij and Ederveen (2008) and Feld and Heckemeyer (2011). This literature finds a substantial impact of taxation. For example, the meta analysis of Feld and Heckemeyer concludes that the semi-elasticity of FDI with respect to the tax rate is around -2.5. They also consider how this estimate depends on various factors, such as the type of FDI and the measure of the tax rate, which we discuss further below. But very little of this literature has considered the impact of taxation on the location of targets of M&A as opposed to cross-border greenfield investment. Other literature that does focus on cross-border M&A sometimes controls for differences in taxation, but this literature pays little

[1] A useful description of the pattern of cross-border M&A activity is provided by Brakman et al. (2007)

[2] Liberini (2014) analyses the effect of home country statutory corporate taxes on the headquarter's decision to expand its extensive margins and diversify into foreign markets.

attention to tax. None of the existing literature explores possible heterogeneous effects of the taxes on the location choice. We provide a conceptual framework to show that the effects of taxes on the location of targets can be heterogenous, depending on the characteristics of the acquirer, target and acquisition. We derive testable predictions which we take to the data. The econometric model we use allows for these heterogeneous effects.

The literature on tax and greenfield FDI has shown that the appropriate measure of an effective tax rate depends on the choice being made.[3] In a model in which capital flows between locations to equalize post-tax rates of return, then in principle FDI flows depend on the effective marginal tax rate. In a model considering the extensive margin in which a company makes a discrete choice between alternative locations, then the choice should depend on an effective average tax rate. However, there has been no comparable analysis of the appropriate measurement of effective tax rates in the case of cross-border M&A. We show that the role of taxes on profits, and hence the probability of choosing a particular target, is not straightforward; in particular, different reasons for the acquisition may imply that different elements of the tax system, and hence measures of effective tax rates, are relevant.

A starting point for our conceptual analysis is that M&A will only occur if it is expected that some surplus is generated. If that surplus is captured wholly by the shareholders of the acquired company, then the acquirer is imply making a zero net present value (NPV) investment. Any difference in tax between possible target locations would be capitalized into the purchase price to keep the NPV equal to zero, but differences in taxes would not affect the choice of target. For tax to affect the choice of target it is therefore necessary for the acquirer to capture at least part of the surplus generated. Assuming this, suppose that the acquirer is able to increase the revenue stream of the target, through improved efficiency, greater knowledge or perhaps simply use of a brand name. The value of the revenue stream is reduced proportionately to the host country statutory tax rate, and so a higher statutory

[3]See Devereux and Griffith (1998) and Devereux and Griffith (2003) for earlier analyses of these issues with respect to greenfield investment. Recent studies which try to define the effective tax rate (ETR), use assumptions regarding how the parent and the host country tax rates interact with each other. For example, Barrios et al. (2012) as well as Huizinga and Voget (2009), construct an ETR based on the subsidiary's pre-tax income which is obviously endogenous since this depends on the actual location choice.

rate would tend to reduce the probability of a particular target being chosen.[4]

However, this effect depends on the tax system in the country of the acquirer. Where that country taxes worldwide profit, with a credit for host country taxation, then the effect of host country taxation may be diminished. This element of the international tax regime was the primary focus of the analysis by Huizinga and Voget (2009) who investigated, in the context of cross-border mergers, which of the two companies involved in a merger became the new parent company. For example, they cite the case of the merger which led to a multinational firm with a parent (Daimler) located in Germany and a subsidiary (Chrysler) in the US as resulting to a large extent from Germany exempting foreign source dividend income while the US taxed such income (net of a foreign tax credit).

We also consider other aspects of the tax regime. For example, in considering the case in which the acquirer may seek to shift production to a lower cost environment, the rate of capital allowance in both countries may be a factor in the choice. This consideration moves the analysis much closer to the conventional treatment of taxation in the case of cross-border greenfield investment. In the context of a cross-border acquisition, however, this effect is likely to be secondary, unless the acquirer intends to undertake significant new capital expenditure in the target, post-acquisition. An alternative may also be possible: that the acquirer can generate a surplus by cutting costs in the target. In this case, more generous treatment of those costs in the host country tax system would reduce the gain from cutting costs.

In order to allow for heterogeneous effect of taxes, we use a form of the random parameters mixed logit model, which avoids making the assumption of the independence of irrelevant alternatives (IIA) inherent in a standard multinomial logit model - that is, that the ratio of two choice probabilities is independent of the other alternatives in the choice set. The closest approach to this in the existing literature is Bertrand and Mucchielli (2007) who estimate a conditional logit model over 400 European cross-border acquisitions in the 1990s, and

[4]However, it may also be the case that the acquisition takes place for strategic reasons, with the acquirer intending to close down the activities of the target to reduce competition (see, for example, Neary (2007)). In this case, a higher tax rate would reduce the value and hence the price of the target, making it more attractive for the acquirer. We discuss these and other possible cases below.

include tax amongst the explanatory variables. However, their approach does require the IIA assumption. We find that our data do not support this assumption, and therefore estimate the more general random parameters model which enables us to allow for heterogeneity of effects of taxes on location choices.

Other approaches in the literature that have considered the impact of taxation on the location of M&A have primarily used aggregate data. For example, Di Giovanni (2005) and Coeurdacier et al. (2009) examine the determinants of aggregate M&A flows between bilateral pairs of countries, using data from 1990-1999 and 1985-2004, respectively. Di Giovanni finds that the size of domestic financial markets has a strong positive association with domestic firms investing abroad, while Coeurdacier et al. find significant effects of membership of the EMU and the EU. Both papers also find a significantly negative impact of corporate taxation in the country of the acquired company. Erel et al. (2012) explore the proportion of the total number of M&A deals that are cross-border, but do not focus on the location of the target. Hebous et al. (2011) do set out to consider the impact of tax on greenfield FDI and cross-border M&A separately, using data on German parent companies However, they use a logit model, identifying separately for each possible location whether M&A takes place, rather than directly examining the choice between different locations. Unlike almost all previous empirical work that has allowed for the impact of taxation on the *location* of M&As, we treat the choice of where to acquire a target company as being made by the ultimate parent company, conditional on choosing to make an acquisition.[5] Instead of just restricting our analyses to cross-border acquisition alone by multinational enterprises (MNE), as it is commonly considered in the literature, we also allow both domestic as well as multinational enterprises to consider the choice of acquisitions that are either domestic or cross-border (for example see Barrios et al. (2012) and Herger et al. (2016)).

[5]Some recent examples from the literature where the main focus is on the effect of taxes but only on cross border aquisitons are Barrios et al. (2012) and Herger et al. (2016). These also differ substantially from our focus and analyses in other dimensions. (i) Barrios et al. use data on european companies over the period 1999-2003. The locations of subsidiaries are inferred from ownership patterns in the data. The model used is conditional logit model that suffers from 'Independence of Irrelevant Alternatives' problem. (ii) Herger et al. look at cross-border acquisitions during 1999-2010 but do not relate it to the parent. Repeated acquisitions in the same country are also treated independently.

As well as investigating heterogeneity across parent countries depending on their tax regimes, we also investigate heterogeneity due to differences in parent company characteristics. It seems plausible that there is some element of fixed costs in undertaking cross-border investments. Such costs are less significant for larger acquisitions; they may also be smaller for companies which already have some overseas activities which may already have paid some or all of such costs. The impact of marginal tax differences between locations may therefore differ between large and small acquirers, between previously purely domestic acquirers and companies that are already multinational, and between locations depending on whether the acquirer already has a presence there. We investigate these sources of heterogeneity.

Of course, in attempting to identify the impact of taxes we need to control for many other factors that are relevant for domestic and cross-border mergers. Cross border M&As induced by differences in the valuation of the target and the acquirer has been the focus of much recent empirical literature. Examples of reasons for differences in valuation explored include: the imperfect integration of capital markets (Erel et al. (2012)); arbitrage generated through mispriced securities (Baker et al. (2009))[6]; weak investor protection and accounting standards (Erel et al. (2012), Rossi and Volpin (2004)); the size of foreign portfolio ownership of target companies (Ferreira et al. (2010)); and the quality of the structure of governance in countries (Ellis et al. (2011), Col and Errunza (2015)). We attempt to control for such effects in our empirical analysis.

In our empirical work, we combine data from two rich world-wide datasets, ORBIS and ZEPHYR.[7] These datasets provide firm-level accounting information and M&A activities. The ownership structure in the form of a full list of recorded shareholders in companies is obtained from ORBIS. We construct a chain of majority-owned subsidiaries for each company, down to the 10th level of dependency. We merge the M&A activities of these companies recorded in ZEPHYR with ORBIS dataset to trace the changes to ownership structures from

[6]This could arise due to overpricing of the acquirer (the "cheap financial capital" hypothesis, similar to the model of Shleifer and Vishny (2003)) or underpricing of the target (the "cheap assets" hypothesis, similar to the model of Shleifer and Vishny (1992)).

[7]These datasets are commercially provided by Bureau van Dijk.

2005 to the end of 2008. The final dataset contains, for each *parent* company, a list of the locations of all majority owned subsidiaries in each year between 2005 and 2008. This identification of all ownership changes due to M&A deals allows us to look at the location aspects of all the observed majority-owned acquisitions.[8] We have in our sample, parent companies located in 27 countries (Table 2) observed to make 2,623 M&As in 19 countries. Among the companies engaged in M&As, only 42% were MNEs. We include the remaining 58% of the corporations that did not have foreign subsidiaries in our model, and all for domestic and foreign acquisitions by these companies.

In our central approach, we consider only companies that make a single acquisition in the three year period 2005-8 (87% of the parent companies). However, as a robustness check we also investigate acquiring companies in more than one location in the period considered. In general, where a target is acquired by the subsidiary of a multinational company, we identify the acquirer as being the parent company of the multinational group. Consider for example, a British subsidiary of a US parent company acquiring a German company. In one sense this represents a flow of foreign direct investment from the UK to Germany. However, control of the German company effectively passes to the US parent. It seems reasonable to suppose that an acquisition of any size would be approved, or more likely be organized, by the parent, which could be considered to have expanded into a third country, and which would, directly or indirectly, control the activities of the whole group.

Our results suggest that, the host country tax rate in general has a significant negative effect on the probability of a company in that country being acquired. However, the size of the effect differs according to the characteristics of the acquirer and to whether the acquisition is domestic or cross-border. More specifically, we find that "domestic companies" (companies that did not previously own any foreign subsidiaries), are unaffected by domestic taxation when choosing to expand within their country, but are significantly affected by changes in foreign taxation when choosing between different cross-border locations. By contrast, multi-

[8]The datasets usually used in anaylsis of M&As do not allow the researchers to identify whether the firms involved in the M&As already had an ownership or not.

national companies are sensitive to taxes for both domestic and cross-border acquisitions, although they are less sensitive to differences in taxation between cross-border locations than are domestic companies. There is some evidence that the tax effects are particularly strong for large companies.

We find evidence that the effect of corporate tax of the target's country plays a much less significant role, or no role at all, when the rate is below that of the acquirer's country, and when the latter operates a worldwide, rather than territorial, tax system. This is consistent with the acquirer taking into account home country taxation on profits earned in the target. This element of the tax system has also been found to be important in the location of parent companies (see Huizinga and Voget (2009), and Voget (2011)), and in the location of new subsidiaries (Barrios et al. (2012)).

Section 2 presents a conceptual framework to explore the role of taxes. We develop a number of hypotheses concerning the role of tax in different situations. In the remainder of the paper, we confront these hypotheses with firm-level data on domestic as well as cross-border acquisitions. In Section 3, we set out our empirical methodology and describe the data in more detail. In Section 4 we present our results and conclude in Section 5.

2 The role of tax in the choice of location of targets

There have been many theoretical contributions of the role of M&As in the development of multinational companies.[9] Very broadly, these tend to distinguish two motives: an efficiency motive where gains arise through economies of scale, internal technology transfer or coordination of decision making, and a strategic motive, where firms seek to enter foreign economies or to reduce competition within their market. The extent of these motives may differ between firms, and across countries. For example, the strategic motive depends on the degree to which the markets in the two countries are integrated. [10] We draw from this

[9]See, for example, Ferrett (2005), Nocke and Yeaple (2007) and Nocke and Yeaple (2008), Neary (2007) and Neary (2009), Norback and Persson (2007), Hijzen et al. (2008), Raff et al. (2009), Stähler (2014).

[10]Greenfield investment has very different strategic implications from acquisition. Host country governments also sometimes view inbound investment in the form of an acquisition rather differently from inbound

literature and consider a simple conceptual framework to explore some testable hypotheses regarding the effects of corporation tax on the choice of a target company by an acquirer.

Acquisitions occur when merging two corporations is expected to increase private value. There are at least three sets of reasons why expected value may increase, relating to differences in valuation, improvements in efficiency and restriction of competition. But any real changes in value must ultimately be reflected in changes in revenue and/or costs; we focus primarily on effects in the target company, but also consider below the case where costs may be shifted from acquirer to target post-acquisition. We consider changes in revenue and costs in order to identify the impact of taxation on the choice of the target company by the acquirer. We also examine how the impact of tax depends on characteristics of the acquirer and target.

We assume that the acquiring company is resident in country h, and seeks to acquire a target company in country j. The target may be in a foreign country, $j \neq h$, or in the domestic country $j = h$; in the discussion, we identify the target with its country, so also use the term "target j" to indicate a target in country j. In the empirical work below, we condition on an acquisition taking place. The central question posed here is whether, and how, the tax system affects the choice of where to acquire a target.

The post-tax surplus captured by the acquirer is given by:

$$S_j = \delta_j \left\{(1 - \tau_{hj})\Delta Y_j - (1 - \theta_j \tau_{hj})\Delta C_j) - (1 - \eta_{hj}\tau_{hj})F_j\right\} \tag{1}$$

where δ_j is the share of the overall surplus generated by the acquisition that is captured by the acquirer, which depends on the acquirer's bargaining strength; ΔY_j is the present value of the increase in income generated in the target, located in country j, after it is acquired; ΔC_j is the present value of the change in costs in the target, after it is acquired; and F_j is a fixed cost associated with acquiring the target. Statutory tax rates are τ_h in the acquirer's country and τ_j in the target's country. However, the overall tax rate may include both corporation tax on profit generated in the target, withholding taxes levied in the target country on income

greenfield investment, on the grounds that it primarily constitutes a change of ownership rather than an addition to the country's capital stock Dinc and Erel (2013), Bertrand et al. (2012). We do not consider greenfield investment choices in this study.

remitted to the acquirer, and any residual tax levied in country h. We denote the overall tax rate applied to income generated in country j, but accruing to the acquirer in country h, as τ_{hj}. Finally, it is possible that only a proportion of the present value of costs can be set against tax - for example, capital expenditure is typically depreciated over time, reducing the present value of deductions. The proportions applied to costs C in country j are θ_j; η_{hj} is the proportion of fixed costs allowable against tax, which depends on the size of allowances and on the proportion of costs incurred in each country. The acquirer will choose a target in country k if

$$S_k > S_j, \qquad \forall j \neq k. \tag{2}$$

Now consider the various factors influencing this choice. First, for given fixed costs, the higher the acquirer's bargaining strength, the higher the acquirer's surplus, S_j. If $\delta_k > \delta_j, \forall j \neq k$, this would make an acquisition in k more likely, ceteris paribus. However, in an international market, it is perhaps more likely that bargaining strength would depend only on characteristics of the acquirer: $\delta_j = \delta, \forall j$. Then if the surplus generated by the acquisition is as shown in (1), a higher bargaining strength would not affect the choice of target company.

Next, to simplify for the moment, suppose that all costs are immediately deductible from tax, $\theta_j = \eta_{hj} = 1$ and that $\delta_j = \delta, \forall j$. Then (1) simplifies to

$$S_j = \delta(1 - \tau_{hj}) \{\Delta Y_j - \Delta C_j - F_j\} = \delta(1 - \tau_{hj}) S_j^*. \tag{3}$$

where $S_j^* = \Delta Y_j - \Delta C_j - F_j$, multiplied by δ, is the acquirer's share of the pre-tax surplus from the acquisition of target j. In this case, the acquirer will choose a target in country k if

$$S_k^* - S_j^* > Z = \tau_{hk} S_k^* - \tau_{hj} S_j^*, \qquad \forall j \neq k. \tag{4}$$

In the absence of tax, then $Z = 0$ and the acquirer will choose target k if the pre-tax surplus in k is higher than for any other potential acquisition. In the presence of tax, the acquirer would choose the target k only if the additional pre-tax surplus in k relative to other

options is greater than Z - that is, it is sufficient to outweigh any possible tax disadvantage in k, where the tax disadvantage is measured by Z. Clearly, $\partial Z/\partial \tau_{hk} > 0$, indicating that a higher overall tax rate on investment from h to k, τ_{hk}, would make it less likely that the acquirer would choose target k. That is:

Proposition 1. *In general, the probability of acquiring a target in a particular country falls as the overall tax rate for an acquisition in that country rises.*

This is the central proposition tested in this paper. However, we expect considerable heterogeneity in responses to taxation, which we now examine.

First, the relative pre-tax surplus $S_k^* - S_j^*, \forall j \neq k$ may depend on firm and country characteristics as costs may differ markedly both between acquirers and locations. For example, undertaking an acquisition in a country new to an acquirer may incur greater fixed costs. This example would include any purely domestic company seeking to acquire abroad for the first time, implying that the surplus from acquiring a domestic target (in this case, country k) could be much higher than the surplus from acquiring a foreign target. Consequently, in this case, the choice of target may be less sensitive to differences in taxation between locations. Another example may be very large companies, for whom fixed costs are relatively small, and who are able to collect detailed information from a greater range of the available options. Both of these factors may imply that differences in pre-tax surpluses between possible targets are smaller for such companies, and hence they may be more sensitive to tax.

Proposition 2. *In general, the choice of a target will be less sensitive to taxation when differences in the pre-tax surplus between locations are greater.*

We investigate Proposition 2 by allowing the impact of taxation to differ between: (a) acquirers that are domestic or multinational prior to the acquisition; (b) small and large acquirers; (c) domestic and foreign acquisitions; and (d) acquisitions in countries where the acquirer already has a presence and those in which it does not.

Second, the impact of taxation on the choice of target may also be lower if the acquirer is a multinational company with the experience and capability of shifting taxable profit to low

tax jurisdictions to reduce its overall tax liability.[11] Suppose for example, that the acquirer is able to shift a proportion ψ of its taxable profit in any jurisdiction to a tax haven, and so escape tax on that proportion of its profit. Then the condition for choosing target k becomes:

$$S_k^* - S_j^* > Z^{PS} = (1-\psi)(\tau_{hk}S_k^* - \tau_{hj}S_j^*), \qquad \forall j \neq k. \tag{5}$$

Clearly $\partial Z^{PS}/\partial\psi < 0$, and so a rise in the proportion of taxable profit shifted makes it less likely that a higher tax rate in country k will cause the acquirer to instead choose a target in another country. Further any impact of a rise in the tax rate in k will have a smaller impact on the probability of the acquirer choosing k, since $\partial^2 Z/\partial\tau_{hk}\partial\psi < 0$. This is intuitive: tax is less likely to affect the choice of the location of the target company when the acquirer has more opportunities to avoid taxes.

Proposition 3. *The impact of the statutory tax rate in the country of the target is weaker when the acquirer is more able to shift income to low-tax jurisdictions.*

In our empirical work, we investigate this proposition by allowing the effects of taxation to depend on two factors, which may reflect the ability to shift profit: (a) whether or not a company is a multinational prior to the acquisition, and (b) the size of the acquirer.

Third, the impact of the statutory tax rate in the country of the target may depend on the tax system in the country of the acquirer. In the simplest case, in which the home country h does not tax income generated in country k, then $\tau_{hk} = \tau_k$ and hence $\partial\tau_{hk}/\partial\tau_k = 1$. However, suppose country h seeks to tax worldwide income, with a credit for any tax paid in k (as remains the cases in the USA, and was the case in the UK until 2009). If country k is the home country ($h = k$) then $\tau_{hk} = \tau_k$ since there is no additional tax on dividends paid within the home country. But if k is a foreign country, then in the extreme case in which there is no deferral of the repatriation of profit, then $\tau_{hk} = \max\{\tau_h, \tau_k\}$. In this extreme case, if $\tau_h > \tau_k$,

[11] See Dharmapala (2014) for a recent review of the vast literature on the effect of taxes on profit shifting. For empirical evidence on this topic, see Egger et al. (2010) and Egger et al. (2014), who use German data. Dharmapala and Riedel (2013), who trace the effect of positive earnings shocks at the parent level on the profit of low-tax subsidiaries.

then $\partial\tau_{hk}/\partial\tau_k = 0$: a marginal rise in the tax rate in k would have no effect on the cut-off value τ_{hk}. In practice, country h tax can be deferred until the profit is repatriated, and hence the present value of the country h tax is reduced. But as long as there is still some residual country h tax, then $\partial\tau_{hk}/\partial\tau_k < 1$. That is, the sensitivity of the overall tax rate to changes in the statutory tax rate in country k is lower, and a rise in the statutory rate in k is less likely to move the overall tax rate across the cut-off threshold, τ^*_{hk}. In sum:

Proposition 4. *The impact of the statutory tax rate in the country of the target is weaker when the country of the acquirer taxes the worldwide income of its resident companies with a credit for tax paid abroad, and the tax rate in the country of the target is lower than the tax rate in the country of the acquirer.*

In our empirical work, we investigate this proposition by allowing the effects of taxation to be different in the case described in this proposition.

Next, we return to the more general formulation of the surplus in (1), which allows for costs not to be fully deductible. To focus only on the role of costs and tax deductions for costs, assume that $\Delta Y_j = F_j = 0$. Then the acquirer would choose target k if

$$\Delta C_j - \Delta C_k > Z^C = \theta_j \tau_{hj} \Delta C_j - \theta_k \tau_{hk} \Delta C_k, \qquad \forall j \neq k. \tag{6}$$

The impact of the permitted rate of deduction in country j, θ_j, depends on whether the target's production costs rise or fall after the acquisition. Both are possible in principle. One way of generating a surplus would be to cut costs in the target country, $\Delta C_k < 0$, while maintaining output and revenue. In the absence of tax, the acquirer would choose target k if costs could be reduced more in k, that is, $\Delta C_j - \Delta C_k > 0$. With tax, this difference in pre-tax costs must again be compared to any tax disadvantage from choosing k, in this case reflected in the relative generosity of allowances measured by θ. For the case of a reduction in costs in the target, $\Delta C_k < 0$, then $\partial Z^C/\partial\theta_k > 0$.That is, higher allowances in k reduce the cost advantage from choosing k, and hence reduce the probability of choosing k. That is:

Proposition 5. *If the acquirer intends to reduce costs in the target, then a higher rate of tax allowance in a country will reduce the probability that a target will be acquired in that country.*

By contrast, suppose that the acquirer plans to shift production from home to the new target company. Assume for simplicity that the reduction of costs at home is the same for all potential targets. But now costs will rise in the target company. Expression (6) still holds, but now $\Delta C_j > 0, \forall j$. In this case, $\partial Z^C / \partial \theta_k < 0$.That is, higher allowances in k increase the advantage from choosing k, and hence increase the probability of choosing k. That is:

Proposition 6. *If the acquirer intends to increase production to the target, then a higher rate of tax allowance in a country will increase the probability that a target will be acquired in that country.*

The difference in the effect of tax allowances reflects the difference in how the cost saving is assumed to take place. In Proposition 5, it takes place in the country of the target, and the value of the saving is reduced by the tax allowance. In proposition 6, it takes place in the home country. The saving is then reduced by the value of the foregone tax allowance in the home country, at the cost of higher expenditure in the foreign country. In order to investigate propositions 5 and 6, in our empirical work, we examine the impact of (i) the *effective average tax rate* (EATR); (ii) a variable measuring the generosity of capital allowances in the host country.

3 Empirical Approach

3.1 Methodology

Our econometric model is informed by our discussions in Section 2. In particular, the discussions showed that the sign of the effect of host country taxes can either be positive or negative dpending on the economic objecties of the company. To capture this, we allow each

parent company to have a different tax effect with the mean effect dependent on company characteristics.

An acquiring company indexed by i in our model, is assumed to acquire a target in a country j which provides the largest expected surplus over all countries, where the latent surplus associated with the target in country j is given by

$$S_{ij} = \beta_j^{'} z_i + \gamma \tau_j + \alpha_i + \varepsilon_{ij} \tag{7}$$

z_i is a vector of choice invariant (company) characteristics that are allowed to have effects that are choice specific which will also include parent country taxes and other base year characteristics of the company. α_i is an unobservable company specific heterogeneity term that may be correlated with included regressors. Since our model conditions on acquisition, we can think of this term α_i as capturing company specific selection effects. For ease of exposition, we assume that there is only one alternative specific variable τ, say the target country specific tax rate. In the estimated model we include other host country variables - see sub-section 3.2. We allow the parameter γ to be randomly distributed across the companies but the mean effect to be dependent on some observable characteristics of the parent. That is, we assume that every company in our sample has its own γ which is known to the company but unknown to the econometrician, and write this as

$$\gamma_i = \gamma_0^{\prime} w_i + \sigma u_i \text{ where } u_i \sim iidN(0,1) \tag{8}$$

i.e. $\gamma_i \sim iidN(\gamma_0^{\prime} w_i, \sigma^2)$. w_i are company specific variables that are assumed to shift the mean effect of γ_i. This model collapses to the standard multinomial choice model when $\sigma = 0$.[12] Substituting (8) into (7) gives

$$S_{ij} = \beta_j^{'} z_i + (\gamma_0^{\prime} w_i + \sigma u_i)\tau_j + \alpha_i + \varepsilon_{ij} = \beta_j^{'} z_i + (\gamma_0^{\prime} w_i)\tau_j + \alpha_i + (\sigma \tau_j u_i + \varepsilon_{ij}) \tag{9}$$

[12]It is customary to call the fixed coefficient logit model, a multinomial logit model when all the variables are choice invariant and a conditional logit model when all the variables are choice specific. However, there is no reason why one cannot have both types of variables in the model as we have. For ease of exposition, we describe the model as a multinomial model when the coefficients are not random.

The company specific error term $\sigma\tau_j u_i$ also induces correlation between alternatives which is not present in the standard multinomial choice model, and which relaxes the IIA assumption. Also note that the new additional error term is now heteroskedastic due to the presence of τ_j. Under the assumption that ε_{ij} is *iid* Gumbel, the conditional probability (conditioned on γ_i) that alternative j is chosen will be of the form of the multinomial logit probability,[13]

$$Prob(y_{ij} = 1|\gamma_i) = \frac{exp\left(\beta_j' z_i + \gamma_i \tau_j\right)}{\sum_l exp\left(\beta_l' z_i + \gamma_i \tau_l\right)}$$

where y_{ij} is a dummy variable which takes the value of 1 if company i chooses alternative j.[14] The new composite error term $v_{ij} = \sigma\tau_j u_i + \varepsilon_{ij}$ will be a mixture of normal and Gumbel distributions. Since γ_i is not known, we have to integrate out the u from the conditional choice probabilities to obtain the unconditional choice probabilities,

$$p_{ij} = Prob(j \text{ is chosen}) = Prob(y_{ij} = 1) = \int \frac{exp\left(\beta_j' z_i + (\gamma_0' w_i)\tau_j + \sigma\tau_j u_i\right)}{\sum_l exp\left(\beta_l' z_i + (\gamma_0' w_i)\tau_l + \sigma\tau_l u_i\right)} \phi(u) du \quad (10)$$

where ϕ denotes the standard Normal density. The log likelihood will consist of terms like in (10). The model is estimated using simulated maximum likelihood using the fact that (10) is a calculation of an expected value. We replace the integral by a sample average of the function constructed by drawing enough observations from $\phi(u)$ to calculate this average. It can be shown that this sample average consistently estimates the choice probabilities given by (10). In our simulations we use 50 Halton draws.[15]

Relative to a standard multinomial logit model, because of the correlation between alter-

[13] For notational ease, we do not explicitly state that the probability statements are all conditioned on the observed data.

[14] (9) collapses to the error components multinomial logit model when we allow for a company specific random intercept. Also note, all company specific covariates that have constant effects across choices including the company specific unobservables α_i, drop out of the equation.

[15] Although there are different ways of drawing random numbers from a particular distribution, the Halton draws have been proven to be very effective Train (2009). The results were very similar with 50 and 100 draws.

natives, this allows us to model (i) random variations in the response probability to changes in variables, (ii) unrestricted substitution patterns, and (iii) correlated unobserved factors Train (2009).[16]

It is common to estimate these choice probabilities as conditional logit models (recent papers include, Barrios et al (2012), Herger et al (2016)) where it is assumed that the effects of z variables are the same across alternatives. Hence parent country taxes can only be brought into the model when they are interacted with alternative specific variables such as the taxes in the host country. We do not do this as our theoretical discussions shows that the relevant tax variables are the satutory variables. This also allows us to separately identify the effects of different taxes on choice probabilities.

3.2 Data

Main data for the analysis come from the 2005 file of ORBIS compiled by the Bureau van Dijk (BvD).[17] This commercial world-wide dataset provides firm-level accounting information on companies, including ownership structure in the form of a full list of recorded shareholders in these companies. We use this to construct a chain of majority-owned subsidiaries for each company, down to the 10th level of dependency. The M&A activities recorded in another commercially available dataset ZEPHYR (BvD), were then merged with the original data from ORBIS to trace the changes in the firms' ownership structure from 2005 to the end of 2008. The final dataset contains, for each parent company, a list of location of all majority owned subsidiaries in each year between 2005 and 2008. This identification of all ownership changes due to M&A deals allows us to look at the location aspects of all the observed majority-owned acquisitions.

Our analysis is based on a cross-section sample of parent companies not defined as 'micro' by the European Commission (2003) in 2005.[18] From this sample, we selected those parent

[16]The model parameters are estimated in NLOGIT 4 (NLOGIT, 2007) using simulated maximum likelihood.

[17]The year 2005 refers to the period 1st April 2005 to 31st March 2006.

[18]Selecting non-micro companies involved selecting only companies with at least two subsequent years of recorded total assets greater than €2,000 and at least one employee.

companies that made at least one acquisition during the three year period 2006 to 2008 regardless of whether they already had a presence in the new country or not. The ultimate parent of the group is treated as being responsible for the expansions directly made and for those undertaken by its majority owned subsidiaries.

The final sample consists of 2,623 parent companies residing in 47 countries. We used ownership information from the original full set of data to identify companies in the same group in our sample. Based on the information in our base year of 2005, companies were classified as: (i) belonging to a multinational group if they were connected by an ownership link of at least 50 per cent of the capital to at least one other company located in a different country ; (ii) belonging to a domestic group if they were connected by an ownership link of at least 50 per cent to other companies, all located in the same country as the parent; or (iii) as a stand-alone company if it did not have any such ownership links with other companies.

The main dependent variable of interest in our model is the choice of a location country during the period 2005-08. If a parent acquires more than one target in a single country in the same year, this parent is recorded as having made one location choice. In that sense, we use the word 'acquisition' to mean a location choice. Some characteristics of the nature of the companies in the dataset are provided in Table 1. Multinationals and domestic groups equally dominate the sample of companies that are engaged in acquisitions during our sample period with only about 15% of acquisitions undertaken by stand-alone companies. The number of companies changing their organizational structure and expanding into a new location equals 40% of the total sample. Most parent companies, exactly 2,282, make only one expansion over the sample period. Considering also the parent companies making multiple acquisitions, we observe a total of 3,051 completed expansions.

We define the target location choice set to preserve reasonable cell sizes for the statistical analysis; specifically we consider only those alternatives that have been chosen by at least 15 different parent companies. This yields us a choice set with eighteen possible countries. Since 59% of the observed expansions were in the same country as the parent, we also add an alternative 'domestic' to the choice set. If the parent company is located in one of the 18

countries, it will have a reduced choice set of 17 alternatives plus the "domestic" option.

The geographical distribution of our parent companies is provided in Table 2. The UK is residence to the largest number of companies undertaking an acquisition, with 674 companies, followed by the USA with 261 and France with 205. Table 3 reports the frequency with which the target locations were chosen by this sample of parents. The United States appears to have the largest number of targets of cross-border acquisitions, and the United Kingdom the largest number of domestic acquisitions.[19]

3.3 Variables

We use a number of variables informed by previous literature and the theoretical section to examine the determinants of M&A activity. We use three different measures of the corporation tax system in each country: (i) the statutory tax rate is the headline corporation tax rate in the country, including typical local tax rates; (ii) the measure of allowances reflects the present value of allowances for a unit of new investment, based on a range of different assets; (iii) the effective average tax rate (EATR) broadly measures the proportion of the net present value of an investment taken in tax. The measure of allowances and the EATR are based on the methodology set out in Devereux and Griffith (2003). In addition, we also include parent country statutory corporate income tax and allow the effect of this to vary across choices. However, we do not discuss the effects of this variable to preserve space (the results are available on request).

Clearly we need to control for non-tax factors that affect acquisition location decisions. Informed by the literature discussed above, we include a number of control variables from various sources: the World Bank World Development Indicators (WDI) database, the GeoDist database (Mayer and Zignago (2011)) from Porta et al. (2008) (see Appendix B). Descriptive statistics for each variable for each of 18 potential target countries are provided in Table 4.

[19] As a robustness check in Table 6, column 4, we include only acquisitions from acquirers in countries that have at least 10 acquiring companies.

4 Results

We first present the results from our base model estimation in Table 5. In Column 1 we begin with the model with fixed coefficients, a standard multinomial logit (MNL) model (see footnote 14). As discussed above, we distinguish between the alternatives of domestic expansion from that of a cross-border expansion, allowing the effect of tax to be different across these two sets of alternatives. To allow for the possibility that multinational enterprises (MNEs) might be in a better position to avoid taxes by shifting income to lower-tax jurisdiction (see Proposition 3), we also allow the impact of taxes to be different between MNEs and domestic companies in all our model specifications. This is done by including an interaction between tax variable and a binary indicator variable for whether the acquirer was a multinational enterprise already before 2005 (indicated by "MNE"). This means that we estimate 4 separate coefficients on the tax variable. We include the 13 choice-specific control variables described above in all specifications. The 'distance' measures are only allowed to affect the cross-border choices. In addition, in all specifications we include choice specific intercepts, and the parent country tax rate, the coefficient of which is permitted to vary across the choices as shown in (9). We report the coefficients of the choice-specific control variables, but in order to keep the presentation manageable, we do not report the choice-specific intercepts or coefficients of the parent country tax rate.

Several of the control variables are significant in all of the specifications in Table 5. The size of the economy, measured by GDP, has a significant positive effect on the probability of acquiring a target in a given country. Also, as expected, targets are more likely to be in countries that are contiguous with the country of the acquirer, that share a common language and a legal system and are closer to each other. The cost of business start-ups has a negative effect on the probability of choosing a particular location, and in some specifications, greater disclosure also has a negative effect. These variables may proxy for a number of aspects of the regulatory framework in the choice country. The size of private credit also has a negative effect. This may reflect a substitution effect: companies may be more prone to being acquired

by a foreign company, if located in countries where the supply of credit, and so the possibility of internal expansion, is restricted. Conditional on these effects, unemployment has a positive effect, which may reflect the relative availability of workers.

The main tax variable used in Table 5 is the statutory tax rate in the target country.[20] In Column 1 the coefficient on this variable is significant only for the domestic tax rate affecting the domestic expansion choice of a multinational. This result is surprising, but it is not robust to varying the model specification.

In Column 2 we present the results from the random parameters (RP) logit model, in which every parent company in our sample has its own tax coefficient for the cross-border choice, and we assume them to be drawn from a normal distribution. Allowing also for a random tax effect for the domestic expansion choice did not produce results different to those where only the cross-border expansion choice tax effect is random. We therefore present results in which the tax effects are random only for the cross-border expansions. Including this random component has an important effect on the estimated coefficients – those presented in the table should be interpreted as a mean effect. The effect of tax on the domestic choice remains similar to the previous specification. But now the tax rate on cross-border acquisitions also becomes significant. Specifically, the first line, which can be interpreted as the effect for acquirers that were purely domestic in 2005, has a negative and highly significant effect. The positive and significant coefficient reported in the second line indicates that multinational companies respond less in cross-border expansion than domestic companies to differences between the tax rates in foreign countries. The maximised value of the log likelihood is much higher in the RP model. In addition, the estimated standard deviation of the random parameters (RP) term is also highly significant. These indicate that this random components model should be preferred over the previous specifications. We therefore use Column 2 as a base for exploring various other forms of heterogeneity in responses to taxation in the remainder of the Table.

[20] As discussed before, all models reported include parent country taxes with effects varying across the choice of countries. These are available on request from the authors.

Prior to discussing the rest of the columns in this table, we comment on the different effects of the tax rate for the different types of company, and for the different options in Column 2, and relate the results to the predictions in Propositions 1, 2 and 3. Consistent with Proposition 1, we find a negative effect of the tax rate in the country of the target for all cross-border acquisitions and for domestic acquisitions for multinational companies. Consistent with Proposition 2, higher fixed costs associated with all outbound acquisitions for domestic companies mean that the choice between outbound locations is not sensitive to tax for these companies. We further explore aspects of Proposition 2 below. Consistent with Proposition 3, the results indicate that multinationals are less sensitive to tax in choosing between cross-border acquisitions, perhaps because multinationals face lower costs in shifting profit to lower-taxed jurisdictions. This is consistent with the findings from Egger et al. (2014) that host-country profit taxes have an insignificant effect on companies which are able to avoid profit taxes.

In Columns 3 and 4 we explore other possible implications of Propositions 2 and 3. In Column 3, we investigate whether the effects of taxation differ according to the size of companies, as well as differentiating between multinationals and domestic companies. One element of the discussion of Proposition 2 is that large multinationals may face smaller differences in pre-tax surpluses between potential targets - because their fixed costs are relatively small, and because they may have the resources to investigate alternative options in more depth (and are hence less likely to miss potential opportunities). Both of these factors may make larger multinationals more sensitive to differences in taxation. Offsetting this, larger multinationals may be more able to shift profits to lower-taxed jurisdictions; which would make them less sensitive to the statutory tax rate in countries of potential targets. We test these propositions in Column 3. We identify a "large" company as one that owned at least 4 subsidiaries (domestic or foreign) in 2005. We have experimented by choosing different numbers of subsidiaries and report the results with the highest maximized value of the log likelihood. The results of Column 3 are mixed, perhaps reflecting these conflicting issues. Large multinationals appear to be more sensitive to tax differences than

small multinationals for the location of both domestic and cross-border expansion. We do not find any significant differences in the response of large and small domestic acquirers. The effects for multinationals are consistent with there being smaller differences across potential targets in their pre-tax surpluses for larger companies, as explored in Proposition 2. It is not consistent with large multinationals having greater opportunities to avoid tax. It is possible that such tax avoidance opportunities are better proxied simply by whether a company is a multinational, rather than by size differences.

In Column 4 we examine whether the effects of taxation depend on whether the acquirer already has a subsidiary in the target location in 2005. Clearly, for cross-border acquisitions this can only apply to multinational companies, which are already located outside of the home country in 2005. We find evidence that there is no significant differential effect between domestic companies and multinationals in the effects of tax on the choice of acquisitions in new countries. However, multinationals are less sensitive to tax in countries in which they already have some presence. These results are consistent with gains from profit shifting by multinationals being focused primarily in countries in which they already have some presence, and hence expertise of the tax system.

In Column 5 we explore Proposition 4, which indicates that the effect of a foreign tax rate may be smaller when the acquirer is resident in a country that taxes worldwide income, with a credit for foreign taxes paid; this tax is levied where the host country has a lower statutory tax rate. We investigate this by allowing the coefficient on the host country tax variable to differ in such circumstances. We find a striking effect for multinational acquirers, though not for domestic acquirers. For the former, we find a large, positive and significant effect, which approximately cancels out the other effects applying to multinational companies (in the first two rows), indicating that in such circumstances the tax rate in the host country effectively has no effect on the choice of cross-border target. Given the possibilities of international tax arbitrage, this is a striking result, which is, however, consistent with results in other contexts. For example, Huizinga and Voget (2009) find that the identity of the parent following a cross-border merger depends on this effect (indicating that acquirers are less likely to be located

in the US, for example). Voget (2011) also finds that such taxation in the country of the parent has a significant impact on relocation of parents.

In Columns 6 and 7, we explore Propositions 5 and 6 which relate to capital expenditure. These consider the cases where it is intended to increase, or reduce, capital expenditure in the target post-acquisition. The value of capital allowances should potentially play a role here: more generous treatment of capital expenditure is beneficial when it is intended to undertake more expenditure, but less beneficial when it is intended to reduce expenditure. More generally, previous literature (for example, Devereux and Griffith (1998)) has argued that the *effective average tax rate* (EATR) is the relevant measure of taxation for new greenfield investments. To the extent to which it is intended to expand the target company post-acquisition, then the EATR would be relevant to the choice of target.

Column 6 uses the baseline of Column 2, but replaces the host country statutory tax rate with the host country Effective Average Tax Rate (EATR), to see whether the EATR is the more relevant measure. A problem here is that the two measures are highly correlated with each other, and so it is difficult to determine separate effects of each measure. Including both tends to raise standard errors, with few of the coefficients remaining significant. Including just the EATR, as we do in Column 6, indicates that the EATR has a similar effect to the statutory rate. The most notable difference is that domestic expansion by non-multinational companies does depend significantly on the EATR. This is consistent with cross-border acquisitions being seen as an alternative to domestic greenfield expansions through additional capital expenditure, especially for domestic companies.

Column 7 instead adds to the statutory tax rate a variable measuring the generosity of capital allowances in the host country, allowing the coefficient to vary according to whether the acquisition is domestic or cross-border and whether the acquirer is a multinational or domestic company. The effects of the statutory rates are very similar to previous specifications. In addition, allowances play a significant and positive role for domestic acquisitions. This is consistent with the result for the EATR in Column 6, since the EATR is in effect a non-linear combination of the measure of allowances used in Column 7 and the statutory

rate. Consistent with Column 6, the more generously domestic capital expenditure is treated by the tax system, the more likely is the company to choose a domestic acquisition. This is consistent with acquirers undertaking new capital expenditure, consistent with Propositions 6, rather than cutting such expenditure in the target company.

4.0.1 Robustness analyses

In Table 6 we carry out various tests of the robustness of our results. Column 1 reproduces the results of Column 2 of Table 5 for ease of comparison. Column 2 of Table 6 investigates whether the results on the impact of the host country tax rate could be due to correlation between the tax rate and the control variables. To examine this we drop all the control variables. The results are very similar, indicating that the inclusion of the control variables has little impact on our estimated effects of taxation

In Table 5 we restrict our analysis to acquirers that made acquisitions in only one country during the time period 2005-8. This induces a potential selection bias, since companies undertaking multiple acquisitions may be more or less responsive to taxation. As a further robustness check, we take the alternative approach of including all acquisitions in our database. However, in order to make this feasible, we treat each acquisition as being independent – in effect treating each of them as if they were being undertaken by a separate company. An acquirer that has made, say, 3 acquisitions will therefore appear in the data 3 times. Clearly, this approach also has econometric problems in that we treat the error terms as being independent. However, the nature of the error is different from our previous approach, and we can gauge how important these problems are by following both approaches. The results, shown in Column 3 of Table 6, are broadly similar to the base case. The only significant difference is that under these circumstances domestic acquirers now appear to be sensitive to tax rates for domestic acquisitions.

In Column 4 of Table 6 we explore whether there is any significant heterogeneity by the location of the acquirer. To explore this, we restrict our sample to acquirers incorporated in countries where we observe at least ten different parent firms, and we revert to using

companies that make only one acquisition. The left panel of Table 2 provides a list of all these countries with large population of acquirers. This sample restriction has little impact on the results; as with Column 3, the only significant difference is that under these circumstances domestic acquirers appear to be marginally more sensitive to tax rates for domestic acquisitions.

Finally, we consider the magnitude of the effects of taxes on the location of acquisitions. Tables 7 and 8 summarise estimated elasticities based on Table 5 columns 1 and 2, respectively. In each case, the diagonal (ii^{th}) shows the own-elasticity: the effects of a 1 percent change in country $i's$ tax rate on probability that an acquirer will choose a target in this country i. Note that the acquirer can be from any country. The off-diagonals show the cross-elasticities: the ij^{th} element shows the effects of a 1 percent change in country $i's$ tax rate on probability that an acquirer will choose a target in country j. By construction, for the standard multinational logit model (Table 7), the off-diagonal elasticities are the same for each row by assumption; that is, a change in the tax rate in, say, Austria has the same effect on the probability of a target choice in all other countries. This assumption is relaxed in Table 8. In both tables, the own-elasticities are generally quite large, and approximately half of them exceed 1 in absolute terms. This implies that, for a typical country in our dataset, with a tax rate of around 30%, a reduction to 27%, for example, would increase the probability that an acquirer chooses that country by more than 10%. Not surprisingly, the cross-elasticities are much smaller, with the exception of elasticities for the domestic tax rate, a change in which has relatively large effects on the probability of choosing each other country.

5 Conclusions

This paper investigates the impact of corporation taxes on the location choice decision of a parent company. We provide a conceptual framework that identifies heterogeneous effects of taxation, depending on the characteristics of the acquirer, target and reason for the acquisi-

tion. We derive testable predictions where we show that, in principle, a higher tax rate in a country could raise, reduce, or leave unchanged the probability that its corporations are the subject of a cross-border acquisition. We consider aspects of the tax regime in both the target's country and acquirer's country. We use a mixed logit (random parameter) model to allow for this heterogeneous response to tax rates.

Our results suggest that the host country tax rate in general has a negative effect on the probability of a company in that country being acquired. On average, elasticities are around 1: a 10% reduction in the tax rate of a country would increase the probability of an acquirer choosing that country, by about 10%. Around half the countries have an estimated elasticity that exceeds 1 in absolute terms. These estimated elasticities differ according to the characteristics of the acquirer and whether the acquisition is domestic or cross-border. More specifically, we find weaker evidence of an effect of taxation on the domestic expansion choices of domestic companies, although their cross-border choices are sensitive to tax in the country of the target company. By contrast, multinational companies are sensitive to taxes for both domestic and cross-border acquisitions, although they are less sensitive to differences in taxation between cross-border acquisitions than are domestic companies. There is some evidence that these effects are particularly strong for large companies.

We also present evidence that the host country tax rate does not play a role in the location decision when the acquirer's country operates a worldwide tax system with a credit for foreign taxes, and where the host country tax rate is lower than the home country tax rate. This is consistent with acquirer taking account of home country taxation on future dividends from the newly-acquired target company. Finally, we find a significant effect of allowances and the Effective Average Tax Rate (EATR) on the choice of target location for domestic companies, which is consistent with cross-border acquisition being seen as an alternative to domestic greenfield expansion through additional capital expenditure.

References

Baker, Malcolm; Foley, C. Fritz, and Wurgler, Jeffrey. Multinationals as Arbitrageurs: The Effect of Stock Market Valuations on Foreign Direct Investment. *Review of Financial Studies*, 22(1):337–369, January 2009.

Barrios, Salvador; Huizinga, Harry; Laeven, Luc, and Nicodème, Gaëtan. International taxation and multinational firm location decisions. *Journal of Public Economics*, 96(11): 946–958, 2012.

Bertrand, Olivier and Mucchielli, Jean-Louis. Location choices of multinational firms: The case of mergers and acquisitions. *Journal of Economic Integration*, 22:181–209, 2007.

Bertrand, Olivier; Hakkala, Katariina Nilsson; Norbäck, Pehr-Johan, and Persson, Lars. Should countries block foreign takeovers of r&d champions and promote greenfield entry? *The Canadian Journal of Economics/Revue canadienne d'économique*, 45(3):1083–1124, 2012.

Brakman, Steven; Garretsen, Harry, and Van Marrewijk, Charles. Cross-border mergers & acquisitions: The facts as a guide for international economics. *International Mergers and Acquisitions Activity Since 1990*, pages 23 – 49, 2007.

Coeurdacier, Nicolas; Santis, Roberto A. De, and Aviat, Antonin. Cross-border mergers and acquisitions and european integration. *Economic Policy*, 24:55–106, 01 2009.

Col, Burcin and Errunza, Vihang. Corporate governance and state expropriation risk. *Journal of Corporate Finance*, 33:71 – 84, 2015.

de Mooij, Ruud A. and Ederveen, Sjef. Corporate tax elasticities: a reader's guide to empirical findings. *Oxford Review of Economic Policy*, 24(4):680–697, 2008.

Devereux, Michael P. and Griffith, Rachel. Taxes and the location of production: evidence from a panel of us multinationals. *Journal of Public Economics*, 68(3):335–367, June 1998.

Devereux, Michael P. and Griffith, Rachel. The impact of corporate taxation on the location of capital: A review. *Economic Analysis and Policy (EAP)*, 33(2):275–292, September 2003.

Dharmapala, Dhammika. What do we know about base erosion and profit shifting? a review of the empirical literature. *Fiscal Studies*, 35(4):421–448, 2014.

Dharmapala, Dhammika and Riedel, Nadine. Earnings shocks and tax-motivated income-shifting: Evidence from European multinationals. *Journal of Public Economics*, 97(C): 95–107, 2013.

Di Giovanni, Julian. What drives capital flows? the case of cross-border m&a activity and financial deepening. *Journal of International Economics*, 65(1):127–149, January 2005.

Dinc, Serdar I. and Erel, Isil. Economic nationalism in mergers and acquisitions. *The Journal of Finance*, 68(6):2471–2514, 2013.

Egger, Peter; Eggert, Wolfgang, and Winner, Hannes. Saving taxes through foreign plant ownership. *Journal of International Economics*, 81(1):99 – 108, 2010.

Egger, Peter H.; Merlo, Valeria, and Wamser, Georg. Unobserved tax avoidance and the tax elasticity of {FDI}. *Journal of Economic Behavior and Organization*, 108:1 – 18, 2014.

Ellis, Jesse; Moeller, Sara B.; Schlingemann, Frederik P., and Stulz, René M. Globalization, governance, and the returns to cross-border acquisitions. Working Paper 16676, National Bureau of Economic Research, January 2011.

Erel, Isil; Liao, Rose C., and Weisbach, Michael S. Determinants of cross-border mergers and acquisitions. *The Journal of Finance*, 67(3):1045–1082, 2012.

Feld, Lars P. and Heckemeyer, Jost H. Fdi and taxation: A meta study. *Journal of Economic Surveys*, 25(2):233–272, 04 2011.

Ferreira, M.A.; Massa, M., and Matos, P. Shareholders at the gate? institutional investors and cross-border mergers and acquisitions. *Review of Financial Studies*, 23(2):601–644, 2010.

Ferrett, Ben. Greenfield investment versus acquisition: alternative models for foreign expansion. *Centre for Research on Globalization and Economic Policy*, Research Paper 39, 2005.

Hebous, Shafik; Ruf, Martin, and Weichenrieder, Alfons. The effects of taxation on the location decision of multinational firms: M&a versus greenfield investments. *National Tax Journal*, 64(3):817–38, 2011.

Herger, Nils; Kotsogiannis, Christos, and McCorriston, Steve. Multiple taxes and alternative forms of fdi: evidence from cross-border acquisitions. *International Tax and Public Finance*, 23(1):82–113, 2016.

Hijzen, Alexander; Görg, Holger, and Manchin, Miriam. Cross-border mergers and acquisitions and the role of trade costs. *European Economic Review*, 52(5):849 – 866, 2008.

Huizinga, Harry P. and Voget, Johannes. International taxation and the direction and volume of cross-border m&as. *Journal of Finance*, 64(3):1217–1249, 06 2009.

Liberini, Federica. Corporate taxes and the growth of the firm. *The Warwick Economics Research Paper Series (TWERPS) 1-42, University of Warwick, 2014*, 2014.

Mayer, Thierry and Zignago, Soledad. Notes on cepii's distances measures: the geodist database. MPRA Paper 26469, University Library of Munich, Germany, December 2011.

Neary, J. Peter. Cross-border mergers as instruments of comparative advantage. *Review of Economic Studies*, 74(4):1229–1257, October 2007.

Neary, J. Peter. Trade costs and foreign direct investment. *International Review of Economics & Finance*, 18(2):207–218, March 2009.

Nocke, Volker and Yeaple, Stephen. Cross-border mergers and acquisitions vs. greenfield foreign direct investment: The role of firm heterogeneity. *Journal of International Economics*, 72(2):336–365, July 2007.

Nocke, Volker and Yeaple, Stephen. An assignment theory of foreign direct investment. *The Review of Economic Studies*, 75(2):529–557, 2008.

Norback, Pehr-Johan and Persson, Lars. Investment liberalization – why a restrictive cross-border merger policy can be counterproductive. *Journal of International Economics*, 72 (2):366–380, July 2007.

Porta, Rafael La; de Silanes, Florencio Lopez, and Shleifer, Andrei. The economic consequences of legal origins. *Journal of Economic Literature*, 46(2):285–332, June 2008.

Raff, Horst; Ryan, Michael, and Stähler, Frank. The choice of market entry mode: Greenfield investment, m&a and joint venture. *International Review of Economics & Finance*, 18(1): 3 – 10, 2009.

Rossi, Stefano and Volpin, Paolo. Cross-country determinants of mergers and acquisitions. *Journal of Financial Economics*, 74(2):277–304, 2004.

Shleifer, Andrei and Vishny, Robert W. Liquidation values and debt capacity: A market equilibrium approach. *Journal of Finance*, 47(4):1343–66, September 1992.

Shleifer, Andrei and Vishny, Robert W. Stock market driven acquisitions. *Journal of Financial Economics*, 70(3):295–311, December 2003.

Stähler, Frank. Partial ownership and cross-border mergers. *Journal of Economics*, 111(3): 209–237, 2014.

Train, Kenneth E. *Discrete Choice Methods with Simulation*. Cambridge Books. Cambridge University Press, December 2009.

Voget, Johannes. Relocation of headquarters and international taxation. *Journal of Public Economics*, 95(9-10):1067–1081, October 2011.

Tables and Figures

Table 1: **Characteristics of Parent Companies**

	Companies	
	Number	%
Total	2,623	
Multinational	1,106	42.2
Domestic	1,127	43
Standalone	390	14.9
Expanding only in one year	2,132	81.3
Expanding in two years	400	15.2
Expanding in three years	91	3.5
Expanding to a New Location	1,085	41.4
Expanding to a Old Location	1,538	58.6
Making only one expansion	2,282	87
Making two expansions	255	9.7
Making more than two expansions	86	3.3
Domestic Expansions	1,806	58.3
Cross-border Expansions	817	41.7

The 2,623 companies observed in our sample made at least one acquisition between the end of 2005 and the end of 2008. Companies are categorised as Multinational, Domestic or Standalone based on the information in the base year 2005. A Parent is defined "standalone" when it does not own any subsidiaries; "domestic" when it only owns subsidiaries in the same country; and "multinational" when it owns at least one subsidiary incorporated in a country different from its own. "Domestic Expansion" refers to acquisitions where the new location corresponds to the Parent Country"

Table 2: **Geographic Distribution of Parent Companies**

Countries with 10 or more Parents					Countries with less than 10 Parents				
	[1]	[2]	[3]	[4]		[1]	[2]	[3]	[4]
United Kingdom	674	192	224	573	Mexico	7	2	6	7
United States	261	83	75	241	Iceland	7	5	3	6
France	205	117	71	170	Colombia	6	2	3	6
Sweden	195	110	68	156	Ukraine	5	0	4	5
Germany	124	81	51	102	Turkey	4	3	3	4
Russia	120	3	56	116	Romania	2	0	2	2
Spain	115	41	44	102	Peru	2	0	1	2
Netherlands	109	85	48	88	New Zealand	2	0	2	2
Canada	93	40	69	83	Kuwait	2	1	2	1
Italy	77	44	31	70	Kazakhstan	2	1	2	2
Finland	69	37	28	57	Hungary	2	2	2	2
Belgium	64	44	25	54	Venezuela	1	1	0	1
Denmark	61	28	31	52	Slovakia	1	0	1	1
Norway	53	14	25	47	Morocco	1	1	1	1
India	52	21	47	45	Luxembourg	1	1	1	0
Switzerland	52	45	23	39	Lithuania	1	1	1	1
Australia	50	21	40	44	Jamaica	1	0	1	1
South Korea	45	9	29	45	Hong Kong	1	1	1	0
Poland	21	1	10	21	Estonia	1	1	1	1
Greece	20	6	6	19	Cyprus	1	1	1	1
Austria	19	13	8	18					
Ireland	19	10	5	19					
Japan	19	18	6	19					
South Africa	16	5	8	16					
Brazil	15	5	6	15					
Portugal	15	6	5	15					
Singapore	10	4	8	10					
Total	2,573	1,083	1,047	2,236	Total	50	23	38	46

The table reports the geographic distribution of the observed 2,623 parent companies. The left panel reports statistics for the "main" countries, as in countries where 10 or more parent firms are located. The location of a parent company corresponds to the original incorporation country, as extracted from the BvD database. Statistics are reported for different subsamples: [1] Total sample; [2] Sample of Multinational Parent Companies only; [3] Sample of Parents expanding in new locations only; [4] Sample of Parents making one expansion only.

Table 3: **Target Locations chosen in Observed Expansions**

	Full Sample		Parents Making One Choice		Multinationals	
Location of Targets	[1]	[2]	[3]	[4]	[5]	[6]
Cross Border:	**1245**	**40.81%**	**695**	**30.46%**	**928**	**64.31%**
Austria	16	1.29%	7	1.01%	11	1.19%
Belgium	40	3.21%	27	3.88%	30	3.23%
Brazil	26	2.09%	15	2.16%	22	2.37%
Canada	37	2.97%	13	1.87%	23	2.48%
Switzerland	16	1.29%	6	0.86%	11	1.19%
Denmark	114	9.16%	54	7.77%	83	8.94%
Finland	18	1.45%	10	1.44%	12	1.29%
France	55	4.42%	37	5.32%	48	5.17%
Germany	36	2.89%	18	2.59%	28	3.02%
Ireland	75	6.02%	40	5.76%	57	6.14%
Italy	233	18.71%	141	20.29%	189	20.37%
Netherlands	33	2.65%	15	2.16%	20	2.16%
Norway	38	3.05%	16	2.30%	29	3.13%
Russia	52	4.18%	31	4.46%	36	3.88%
Spain	36	2.89%	21	3.02%	23	2.48%
Sweden	42	3.37%	26	3.74%	35	3.77%
United Kingdom	73	5.86%	**49**	7.05%	**50**	5.39%
United States	305	24.50%	169	24.32%	221	23.81%
Domestic:	**1806**	**59.19%**	**1587**	**69.54%**	**515**	**35.69%**
Australia	18	1.00%	18	1.13%	5	0.97%
Austria	8	0.44%	8	0.50%	4	0.78%
Belgium	34	1.88%	31	1.95%	16	3.11%
Brazil	11	0.61%	11	0.69%	2	0.39%
Canada	62	3.43%	53	3.34%	20	3.88%
Colombia	6	0.33%	6	0.38%	2	0.39%
Denmark	30	1.66%	24	1.51%	7	1.36%
Finland	43	2.38%	37	2.33%	15	2.91%
France	137	7.59%	123	7.75%	54	10.49%
Germany	81	4.49%	67	4.22%	46	8.93%

Continued on next page

Table 3 – continued from previous page

	[1]	[2]	[3]	[4]	[5]	[6]
Greece	17	0.94%	17	1.07%	4	0.78%
India	13	0.72%	13	0.82%	3	0.58%
Ireland	7	0.39%	7	0.44%	2	0.39%
Italy	53	2.93%	48	3.02%	27	5.24%
Japan	7	0.39%	7	0.44%	6	1.17%
Mexico	1	0.06%	1	0.06%	0	0.00%
Netherlands	45	2.49%	34	2.14%	25	4.85%
Norway	32	1.77%	27	1.70%	6	1.17%
Peru	2	0.11%	2	0.13%	0	0.00%
Poland	20	1.11%	20	1.26%	1	0.19%
Portugal	9	0.50%	9	0.57%	3	0.58%
Romania	2	0.11%	2	0.13%	0	0.00%
Russia	117	6.48%	113	7.12%	2	0.39%
Singapore	6	0.33%	6	0.38%	2	0.39%
South Africa	7	0.39%	7	0.44%	0	0.00%
South Korea	37	2.05%	37	2.33%	5	0.97%
Spain	93	5.15%	84	5.29%	22	4.27%
Sweden	121	6.70%	98	6.18%	55	10.68%
Switzerland	14	0.78%	12	0.76%	10	1.94%
Ukraine	3	0.17%	3	0.19%	0	0.00%
United Kingdom	554	30.68%	460	28.99%	126	24.47%
United States	216	11.96%	202	12.73%	45	8.74%
Total	**3051**		**2282**		**1443**	

This table lists the countries chosen as acquisition locations during the sample period end of 2005 to end of 2008: for the full sample (columns [1] and [2]); for the sample of companies making only one choice (columns [3] and [4]); for the sample of multinational companies (column [5] and [6]). The information is split according to whether the acquisition was domestic (Dom) or cross-border (CB). The totals report the number of expansions. The percentages are calculated for the chosen category.

Table 4: **Corporate Tax Rates and Explanatory Variables by Expansion Location Alternative**

	Acquisition Location Alternatives																		
Variable	AT	BE	BR	CA	CH	DE	DK	ES	FI	FR	GB	IE	IT	NL	NO	RU	SE	US	Dom.
STR	0.25	0.34	0.34	0.35	0.21	0.37	0.27	0.33	0.26	0.34	0.29	0.13	0.36	0.27	0.28	0.24	0.28	0.40	0.31
EATR	0.23	0.28	0.33	0.31	0.17	0.35	0.23	0.31	0.22	0.29	0.26	0.11	0.31	0.23	0.25	0.21	0.23	0.35	0.27
Capital Allowances	0.12	0.20	0.16	0.18	0.13	0.17	0.15	0.15	0.14	0.20	0.15	0.06	0.19	0.14	0.15	0.13	0.16	0.20	0.16
ln(GDP)	26.1	26.3	27.4	27.5	26.4	28.4	25.9	27.3	25.7	28.0	28.2	25.6	27.8	26.8	26.0	26.7	26.4	30.1	27.6
GDP growth	3.25	2.37	5.11	1.99	3.15	2.48	1.39	2.95	3.92	1.79	2.12	2.94	0.97	3.04	2.30	7.59	2.71	1.68	2.77
Cost fo Business Startup	5.38	5.44	9.60	0.80	2.13	5.47	0.00	15.41	1.03	1.08	0.77	0.30	19.1	6.33	2.30	4.53	0.63	0.73	5.02
Business Disclosure Index	3.00	8.00	6.00	8.00	0.00	5.00	7.00	5.00	6.00	10.0	10.0	10.0	7.00	4.00	7.00	6.00	6.00	7.00	7.43
Unemployment	4.34	7.60	7.91	6.13	3.68	8.92	3.67	9.22	6.97	8.13	5.28	4.98	6.48	3.26	2.82	6.46	6.38	4.92	6.01
Market Capital to GDP	0.16	0.67	0.38	1.05	2.52	0.54	0.57	0.77	1.77	0.88	1.57	0.67	0.53	1.32	0.40	0.33	1.13	1.42	1.11
ln(Domestic Firms)	2.49	2.74	0.89	4.30	3.58	2.30	3.67	3.82	3.35	2.62	3.56	2.88	1.59	2.52	3.69	0.41	3.44	3.13	3.06
Private Credit to GDP	1.01	0.78	0.35	0.96	1.59	1.16	1.10	0.96	0.56	0.84	1.30	1.02	0.75	1.32	0.93	0.14	0.88	2.05	1.10
Distance btw Capitals (th km)	2.63	2.26	9.31	5.83	2.47	2.50	2.43	3.07	2.92	2.46	2.95	2.43	2.95	2.30	2.55	3.49	2.81	6.66	0.41
Common Legal System	0.10	0.27	0.29	0.42	0.09	0.06	0.13	0.26	0.13	0.23	0.25	0.44	0.27	0.26	0.14	0.26	0.08	0.39	1.00
Corrusption Score	1.83	1.21	0.01	2.27	2.26	1.85	2.34	1.32	2.39	1.50	2.09	1.81	0.77	2.27	2.11	-0.81	2.35	1.77	1.69

The means for the variables used in the estimations are provided for the 18 countries used as a possible location choice. The tax data (1st to 3rd row) were provided by the Oxford University Centre for Business Taxation database, this in turn has been developed from country reports of the International Bureau for Fiscal Documentation (IBFD) and other sources; variables in the 4th to 11th rows were taken from the World Bank World Development Indicators (WDI) database; variables in 12th to 14th rows were taken from the GeoDist database (Mayer and Zignago, (2011) and La Porta et. al (2008). Details for each variable are given in Section 4.3

Table 5: **Random Parameter Logit Model Estimation Results**

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
	Basic Specification Multinomial Logit	Basic Specification RP Logit	"Large" = 4 or more subsidiaries in 2005	Alternative is a New Location choice	Parent vs Host Country Taxes	Effective Averate Tax Rate	Statutory Tax Rate + Allowances
Interaction of host-country Statutory Tax Rate (τ_j) for Cross Border expansions:							
Intercept	-3.886	-12.349**	-11.283**	-8.025**	-13.554***		-9.454*
	(3.064)	(4.857)	(4.817)	(4.052)	(4.862)		(5.156)
MNE	0.598	5.078**	7.187**		7.550***		5.106**
	(1.132)	(2.412)	(2.95)		(2.553)		(2.424)
large MNE			-4.054**				
			(2.064)				
large non-MNE			-4.113				
			(2.802)				
MNE & Choice is a New-Location				2.403			
				(1.758)			
MNE & Choice is a Old-Location				5.913***			
				(1.791)			
Interaction of ($\tau_h - \tau_j$) for Cross Border Expansion:							
MNE & Credit System when ($\tau_h > \tau_j$)					7.405***		
					(2.793)		
non-MNE & Credit System when ($\tau_h > \tau_j$)					-3.810		
					(4.134)		
Interaction of Host Country Effective Average Tax Rate (EATR) for Cross Border expansions:							
Intercept						-10.672**	
						(5.344)	
MNE						5.217**	
						(2.34)	
Interaction of Host Country Tax Allowaces for Cross Border expansions:							
Intercept							-4.216
							(3.257)
MNE							-2.214
							(1.947)
Interaction of host-country Statutory Tax Rate (τ_h) for Domestic expansions:							
Intercept	-3.136	-5.78	-4.951	-5.494*	-7.634**		-8.688**
	(2.388)	(3.693)	(3.726)	(2.936)	(3.800)		(4.223)
MNE	-5.470***	-5.687***	-2.762	-3.970***	-2.544		-6.296**
	(1.221)	(1.441)	(2.236)	(1.306)	(1.847)		(3.119)
MNE & large			-4.502**				
			(2.085)				
non-MNE & large			-2.268				
			(2.832)				
Interaction of Host Country Effective Average Tax Rate (EATR) for Domestic expansions:							
Intercept						-7.706**	
						(3.613)	
MNE						-6.132***	
						(1.539)	

Continued on next page

Table 5 – continued from previous page

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Interaction of Host Country Tax Allowaces for Domestic expansions:							
Intercept							10.225***
							(2.919)
MNE							-2.013
							(2.208)
Control Variables:							
log GDP (constant 2000 USD)	0.569***	1.045***	1.028***	0.7330***	1.054***	1.155***	1.432***
	(0.105)	(0.257)	(0.260)	(0.187)	(0.265)	(.27)	(.318)
GDP growth	-0.042	-0.066	-0.064	-0.049	-0.068	-0.061	-0.06
	(0.039)	(0.051)	(0.051)	(0.044)	(0.051)	(.049)	(.053)
Cost of business start-ups as % of GNI	-0.036***	-0.060***	-0.060***	-0.043***	-0.060***	-0.058***	-0.064***
	(0.006)	(0.014)	(0.014)	(0.010)	(0.014)	(.013)	(.015)
Business extent of disclosure index	-0.04	-0.010*	-0.102*	-0.062	-0.100*	-0.117**	-0.151**
	(0.03)	(0.055)	(0.055)	(0.040)	(0.054)	(.055)	(.061)
Unemployment as a % of labour force	0.060**	0.065*	0.064*	0.063**	0.058	0.067*	0.071*
	(0.024)	(0.037)	(0.037)	(0.029)	(0.037)	(.035)	(.039)
Average Corruption Score (1996 – 2000)	-0.195	-0.368	-0.403	-0.259	-0.428	-0.357	-0.242
	(0.146)	(0.251)	(0.252)	(0.181)	(0.262)	(.244)	(.274)
Market capitalization to GDP (1999 – 2003)	0.101	0.18	0.164	0.147	0.208	-0.026	-0.251
	(0.166)	(0.279)	(0.278)	(0.257)	(0.279)	(.269)	(.314)
No. Domestic Firms (1999 – 2003)	0.067	0.074	0.086	0.089	0.115	0.168	0.222
	(0.104)	(0.176)	(0.176)	(0.127)	(0.175)	(.169)	(.193)
Private credit to GDP (1999 – 2003)	-1.087***	-1.780***	-1.754***	-1.286***	-1.697***	-1.794***	-2.056***
	(0.254)	(0.496)	(0.497)	(0.362)	(0.493)	(.482)	(.537)
Control Variables specific to CB expansions:							
Contiguity of Host and Target Country	0.492***	0.455***	0.454***	0.403**	0.388**	0.476***	0.406**
	(0.16)	(0.172)	(0.172)	(0.168)	(0.175)	(.172)	(.182)
Common Language	0.342**	0.315*	0.324*	0.318*	0.335*	0.294	0.338*
	(0.17)	(0.184))	(0.184)	(0.178)	(0.183	(.186)	(.19)
Distance btw capitals of Host and Target	-0.281***	-0.424***	-0.404***	-0.282***	-0.451	-0.400***	-0.445***
	(0.069)	(0.085)	(0.085)	(0.084)	(0.087)	(.081)	(.089)
Common Legal System	0.798***	0.800***	0.802***	0.726***	0.801***	0.814***	0.803***
	(0.123)	(0.127)	(0.127)	(0.127)	(0.127)	(.131)	(.134)
Standard Deviation of the RP on tax (σ)		7.620***	7.547***	3.650*	7.558***	7.720***	8.045***
		(2.238)	(2.288)	(1.927)	(2.235)	(2.262)	(2.169)
Maximised Log Likelihood	-2608.1	-2602.28	-2597.17	-2563.22	-2596.61	-2590.81	-2571.47

*The dependent variable takes the value of 1 if the parent company chooses a particular location among a set of alternatives. The choice set varies across companies. Some have 18 and some have 19 alternatives, depending on whether the domestic acquisition is part of the choice set or not. All specifications are random parameter logit (RPL) except column [1] which gives the results from a simple multinomial logit model. The RPL model allows the effect of host country tax variable (τ_j) to be random across companies. The RPL model was maximised using simulated maximum likelihood with 50 Halton random draws. All models allow intercepts and parent country statutory tax rate (τ_i) effects to vary with the alternatives. Sample size corresponds to the 2,282 parents that made only one location choice during the period 2005-2008. "MNE" is a binary indicator for multinational enterprises as defined in the base year 2005. "Credit System" is an indicator for parent countries which operate a credit system. The intercept provides effects for the reference case, which varies across columns. Standard errors are in parentheses. The asterisks indicate significance: *** (1%), ** (5%), * (10%).*

Table 6: **Random Parameter Logit Model - Robustness Checks**

	[1]	[2]	[3]	[4]
	Basic Specification RP Logit (Tab. 5, Col. [2])	Like [1], without control variables	Like [1], including multi-country acquisitions	Like [1], only main parent countries
Interaction of host-country statutory tax rate (τ_j) for Cross Border expansions:				
Intercept	-12.349**	-13.917**	-10.947**	-12.261**
	(4.857)	(6.479)	(4.487)	(4.912)
MNE	5.078**	6.474**	7.463***	4.994**
	(2.412)	(3.207)	(2.328)	(2.424)
Interaction of host-country statutory tax rate (τ_h) for Domestic expansions:				
Intercept	-5.78	5.345	-7.786**	-6.8228*
	(3.693)	(3.595)	(3.441)	(3.748)
MNE	-5.687***	-5.880***	-4.693***	-5.650***
	(1.441)	(1.551)	(1.117)	(1.438)
Control Variables:				
log GDP (constant 2000 USD)	1.045***		1.098***	1.102***
	(0.257)		(0.242)	(0.271)
GDP growth	-0.066		-0.063	-0.07
	(0.051)		(0.043)	(0.050)
Cost of business start-ups as % of GNI	-0.060***		-0.056***	-0.058***
	(0.014)		(0.013)	(0.014)
Business extent of disclosure index	-0.010*		-0.110**	-0.111**
	(0.055)		(0.051)	(0.056)
Unemployment as a % of labour force	0.065*		0.070**	0.065*
	(0.037)		(0.035)	(0.037)
Average Corruption Score (1996-2000)	-0.368		-0.383*	-0.309
	(0.251)		(0.231)	(0.245)
Market capitalization to GDP (1999-2003)	0.18		-0.246	0.139
	(0.279)		(0.256)	(0.277)
No. Domestic Firms (1999-2003)	0.074		0.15	0.111
	(0.176)		(0.167)	(0.175)
Private credit to GDP (1999-2003)	-1.780***		-1.444***	-1.859***
	(0.496)		(0.455)	(0.503)

Continued on next page

Table 6 – continued from previous page

	[1]	[2]	[3]	[4]
Control Variables specific to CB expansions:				
Contiguity of Host and Target Country	0.455***		0.378***	0.459***
	(0.172)		(0.131)	(0.172)
Common Language	0.315*		0.250*	0.316*
	(0.184)		(0.141)	(0.184)
Distance btw capitals of Host	-0.424***		-0.424***	-0.419***
and Target Country	(0.085)		(0.064)	(0.086)
Common Legal System	0.800***		0.694***	0.797***
	(0.127)		(0.100)	(0.127)
Standard Deviation of the RP on tax (σ)	7.620***	8.806**	8.803***	7.504***
	(2.238)	(3.475)	(2.173)	(2.302)
Maximised Log Likelihood	-2,602.28	-2,796.12	-4,423.24	-2,600.49
Number of Companies	2,282	2,282	3,051	2,236

*The dependent variable takes the value of 1 if the parent company chooses a particular location among a set of alternatives. The choice set is unchanged w.r.t. Table 5. All specifications are random parameter logit. The RPL model allows the effect of host country tax variable to be random across companies. The RPL model was maximised using simulated maximum likelihood with 50 Halton random draws. In addition to the coefficients reported, all models allow intercepts and parent country statutory tax rate effects to vary with the alternatives. Column [1] reports the preferred model from Table 5 (Column [2]). Column [2] re-estimate this model without geographical controls. Column [3] includes the companies making acquisitions in more than one country during the sample period end of 2005 to end of 2008 (for a total of 3,051 expansions). Column [4] includes only acquisitions made by those parents incorporated in countries where we observe at least other 9 parent firms, as indicated in Table 2 (for a total of 2,276 expansions). The intercept provides effects for the reference case, which varies across columns. Standard errors are in parentheses. The asterisks indicate significance: *** (1%), ** (5%), * (10%).*

Table 7: **Tax Elasticities - estimates based on Multinomial Logit Model**

Elasticity (row i column j) refers to the probability that a change in the tax rate in country i will have on the probability of choosing country j. Estimates obtained using results from Col. [1] of Table 5.

	AT	BE	BR	CA	CH	DE	DK	DOM	ES	FI	FR	GB	IE	IT	NL	NO	RU	SE	US
AT	-0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BE	0.02	-1.27	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
BR	0.01	0.01	-1.3	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
CA	0.01	0.01	0.01	-1.32	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
CH	0.00	0.00	0.00	0.00	-0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DE	0.03	0.03	0.03	0.03	0.03	-1.34	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
DK	0.00	0.00	0.00	0.00	0.00	0.00	-1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DOM	0.68	0.68	0.68	0.68	0.68	0.68	0.68	-0.29	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
ES	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	-1.18	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
FI	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-0.98	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
FR	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	-1.21	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
GB	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	-0.78	0.07	0.07	0.07	0.07	0.07	0.07	0.07
IE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.48	0.00	0.00	0.00	0.00	0.00	0.00
IT	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-1.33	0.01	0.01	0.01	0.01	0.01
NL	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-0.98	0.01	0.01	0.01	0.01
NO	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-1.06	0.01	0.01	0.01
RU	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-0.87	0.01	0.01
SE	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	-0.99	0.02
US	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	-1.28

Table 8: **Tax Elasticities - estimates based on Random Parameter Logit Model**
Elasticity (row i column j) refers to the probability that a change in the tax rate in country i will have on the probability of choosing country j. Estimates obtained using results from Col. [2] of Table 5.

	AT	BE	BR	CA	CH	DE	DK	DOM	ES	FI	FR	GB	IE	IT	NL	NO	RU	SE	US
AT	-1.24	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
BE	0.01	-0.76	0.00	0.00	0.02	0.00	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.00	0.02	0.01	0.02	0.01	-0.01
BR	0.01	0.00	-0.8	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
CA	0.00	-0.01	-0.01	-0.64	0.00	-0.01	0.00	0.01	-0.01	0	-0.01	0.00	0.01	-0.01	0.00	0.00	0.00	0.00	0.00
CH	0.00	0.00	0.00	0.00	-1.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DE	0.02	-0.01	-0.01	-0.02	0.03	-0.53	0.02	0.03	0.00	0.02	0.00	0.02	0.03	-0.02	0.02	0.01	0.02	0.02	-0.03
DK	0.01	0.00	0.00	0.00	0.01	0.00	-1.14	0.01	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
DOM	0.95	0.74	0.73	0.72	1.04	0.69	0.9	-0.31	0.79	0.93	0.76	0.95	1.24	0.71	0.91	0.88	0.98	0.9	0.69
ES	0.02	0.00	0.00	0.00	0.02	0.00	0.02	0.02	-0.86	0.02	0.02	0.02	0.03	0.00	0.02	0.01	0.02	0.02	0.00
FI	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-1.18	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.00
FR	0.02	0.01	0.00	0.00	0.03	0.00	0.02	0.02	0.01	0.02	-0.73	0.02	0.03	0.00	0.02	0.02	0.02	0.02	-0.01
GB	0.09	0.04	0.03	0.03	0.1	0.02	0.08	0.1	0.05	0.08	0.05	-0.76	0.12	0.03	0.09	0.07	0.09	0.08	0.04
IE	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.01	-1.1	0.00	0.01	0.01	0.01	0.01	0.00
IT	0.01	0.00	0.00	0.00	0.01	-0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.01	-0.65	0.01	0.00	0.01	0.01	-0.01
NL	0.02	0.02	0.01	0.01	0.02	0.01	0.02	0.02	0.01	0.02	0.01	0.02	0.03	0.01	-1.11	0.02	0.02	0.02	0.00
NO	0.01	0.01	0.01	0.01	0.02	0.00	0.01	0.02	0.01	0.02	0.01	0.01	0.02	0.01	0.01	-1.11	0.02	0.02	0.00
RU	0.02	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.01	0.02	0.01	0.02	0.02	0.01	0.02	0.02	-1.22	0.02	0.01
SE	0.03	0.02	0.02	0.02	0.04	0.01	0.03	0.04	0.02	0.04	0.02	0.03	0.04	0.02	0.03	0.03	0.04	-1.04	0.01
US	0.06	-0.04	-0.05	-0.03	0.08	-0.08	0.05	0.07	-0.01	0.05	-0.03	0.14	0.1	-0.06	0.05	0.03	0.07	0.05	-0.47

Appendices

A Marginal Effects and Elasticities in Multinomial and Mixed (Random Parameter) Logit Models

The model specification for the latent surplus derived from a particular choice of a target company in country$j(= 1, \ldots, J)$ by acquirer i is given by

$$S_{ij} = \beta_j^{'} z_i + \gamma x_j + \alpha_i + \varepsilon_{ij} \tag{A.1}$$

where z_i is a vector of choice invariant (company) characteristics. For ease of exposition, we assume that there is only one alternative specific variable x, say the target country specific tax rate. The company is assumed to make the choice which gives the largest surplus.

Multinomial Logit Model

Marginal Effect of a change in location j specific variable x_j (the target country j's tax rate), on the probability of a particular choice of a target company in the same country j is

$$\frac{\partial p_{ij}}{\partial x_j} = \frac{\partial}{\partial x_j} \left[\frac{exp\{\beta_j^{'} z_i + \gamma x_j\}}{\sum_{k=1}^{J} exp\{\beta_k^{'} z_i + \gamma x_k\}} \right] = p_{ij}(1 - p_{ij})\gamma \tag{A.2}$$

where,

$$p_{ij} \equiv Prob(j \text{ is chosen }) = \frac{exp\{\beta_j^{'} z_i + \gamma x_j\}}{\sum_{k=1}^{J} exp\{\beta_k^{'} z_i + \gamma x_k\}} \tag{A.3}$$

The corresponding elasticity is given by

$$\frac{\partial \log p_{ij}}{\partial \log x_j} = (1 - p_{ij}) x_j \gamma \tag{A.4}$$

Similarly, it is easy to show that the cross marginal effect with respect to another location m's tax rate is

$$\frac{\partial p_{ij}}{\partial x_m} = \frac{\partial}{\partial x_m}\left[\frac{exp\{\beta_j' z_i + \gamma x_m\}}{\sum_{k=1}^{J} exp\{\beta_k' z_i + \gamma x_k\}}\right] = -p_{ij}p_{im}\gamma \tag{A.5}$$

And the corresponding elasticity is given by

$$\frac{\partial \log p_{ij}}{\partial \log x_m} = -p_{im}x_m\gamma \tag{A.6}$$

Note, the elasticity in (A.6) does not depend on j.

We see from the above that a change in the tax rate at a particular target location will have an effect on not just the probability of choosing that location but the probability of choosing all other locations too.

Random Parameter Logit (RPL) or Mixed Logit Model

Instead of assuming that γ is fixed in (A.1), we now assume that every company in our sample has its own γ and write this as

$$\gamma_i = \gamma' w_i + \sigma u_i \text{ where } u_i \sim \text{ iid } N(0,1) \tag{A.7}$$

i.e. $\gamma_i \sim$ iid $N(\gamma' w_i, \sigma^2)$. This model collapses to the earlier one when $\sigma = 0$.

Substituting (A.7) into (A.1), we get

$$S_{ij} = \beta_j' z_i + (\gamma' w_i + \sigma u_i)x_j + (\sigma x_j u_i + \varepsilon_{ij}) \tag{A.8}$$

Estimation of company specific effect γ_i

u_i in (A.8) is an unobserved company specific random variable. Then, by Bayes theorem, the density of u_i given data

$$f(u_i|data) = \frac{f(u_i|choices) = f(choices|u_i)f(u_i)}{f(choices)}$$

Thus,

$$E(u_i|choices) = \int uf(u|choices)du = \frac{\int uf(choices|u)f(u)du}{f(choices)} \tag{A.9}$$

$f(choices|u)$ is the conditional likelihood which appears in the likelihood function prior to marginalisation, and $f(choices)$ is the marginal likelihood which are obtained during the maximisation. $f(u)$ is the standard normal density by assumption in our model. The estimated $E(u_i|choices)$ is known as the Bayesian shrinkage estimator.

Marginal effects and Elasticities

The conditional marginal effects and elasticities in this model will be given by equations (A.2)-(A.6). In order to obtain the unconditional marginal effects and elasticities, one has to marginalise this with respect to the distribution of the coefficients (i.e the random error u here), which again requires simulations to approximate the integral as discussed above.

B Variable Source

	Variable Description	Source
Tax Variables:		
Statutory Tax Rate	Main statutory tax rate, including typical local taxes	CBT database
Effective Average Tax Rate	Effective average tax rate, using the Devereux-Griffith (2003) method	CBT database
Allowance	The present value of tax allowances permitted per unit of investment	CBT database
Economic Indicators:		
ln(GDP)	ln of GDP (originally measured in constant 2000 USD)	WDI, 2011
GDP growth	GDP growth (annual %)	WDI, 2011
Cost Bus. Start-up	Cost of business start-up procedures (% of GNI per capita)	WDI, 2011
Bus. Discl. Index	Business extent of disclosure index (0=less disclosure to 10=more disclosure)	WDI, 2011
Unempl.	Total Unemployment (% of total labor force)	WDI, 2011
Distance Variables:		
Contiguity	Dummy for Contiguity (=1 parent country and alternative location share borders)	GeoDist, 2011
Common Language	Dummy for Common Language (=1 parent country and location have same official or primary language)	GeoDist, 2011
Distance btw Capitals	Simple distance between capitals (measured in km)	GeoDist, 2011
Common Legal Syst.	Dummy for Legal System (=1 if parent country and location have same Legal System)	La Porta, 2008
Institutional Variables:		
Corruption Score	Average corruption score over the period 1996-2000	WDI, 2011
Mkt Capit. To GDP	Ratio of market capitalisation to GDP, av. 1999-2003	WDI, 2011
Private Credit to GDP	Private credit to GDP, av. 1999-2003	WDI, 2011
ln(No. Dom. Firms)	ln(No. Domestic Firms pc), av. 1999-2003	WDI, 2011