Horizontal, Vertical, and Conglomerate FDI: Evidence from Cross Border Acquisitions

Nils Herger, and Steve McCorriston

Working Paper 14.02

Horizontal, Vertical, and Conglomerate FDI: Evidence from Cross Border Acquisitions*

Nils Herger† and Steve McCorriston‡

February, 2014

Abstract

By using data on cross-border acquisitions (CBAs), this paper explores the distribution of the strategies pursued when multinational enterprizes integrate a foreign subsidiary into their organisational structure. Based on a measure of vertical relatedness, each of the 165,000 acquisitions in our sample covering 31 source and 58 host countries can be classified as horizontal, vertical, or conglomerate. Three novel features of CBAs are highlighted. First, horizontal and vertical CBAs are relatively stable over time. Second, substantial parts of CBAs involve conglomerate acquisitions. Third, the wave-like growth of CBAs arises primarily from changes in conglomerate activity, which responds to international valuation differences between financial markets.

JEL classification: F15, F21, F23, F33

Keywords: Cross-Border Acquisitions, Multinational Firm, Horizontal Merger, Vertical Merger, Conglomerate Merger

1 Introduction

By coordinating international trade or managing cross-border investment projects, multinational enterprises (MNEs) are an important protagonist of international economic integration. By borrowing established notions from industrial organization, the international economics literature distinguishes typically between horizontal and vertical strategies to identify the benefits of firms with plants in several countries. Horizontal strategies rests on a firms' desire to access a foreign market by replicating production activities abroad. Vertical strategies involve the fragmentation of the supply chain to place production stages using a factor relatively intensively in locations that are well endowed with it. Conversely, in international economics literature, conglomerate (or diversifying) strategies rarely get mentioned and when they do, they are usually lumped together in a "non-horizontal" group (see Hijzen *et al.*, 2008, p.851; Coerdacier *et al.*, 2009, p.64).

*Acknowledgements: We would like to thank Ron Davies, the conference participants at the ETSG 2012 in Leuven, and the seminar participants at the University Collage of Dublin for valuable discussions and comments. The usual disclaimer applies.

†Study Center Gerzensee, Dorfstrasse 2, P.O. Box 21, 3115 Gerzensee, Switzerland, E-mail: nils.herger@szgerzensee.ch.

‡Department of Economics. University of Exeter Business School, Streatham Court, Rennes Drive, Exeter EX4 4PU, England, UK. E-mail: s.mccorriston@exeter.ac.uk.

Understanding the strategies pursued by MNEs is important for theoretical and policy reasons. As regards theory, in essence, models of the MNE have to address the question why a firm benefits from maintaining plants in several countries given that plenty of alternatives—such as exporting, concentrating production in the home country, entering a joint venture with a local firm—would permit to avoid the monitoring cost and uncertainties of running a business in a foreign country. As regards policy, the focus on the strategies of multinational integration is given by the importance that governments place on attracting inward investment, which is often preferred in form of FDI rather than portfolio investment. For example, Mutti and Grubert (2004) highlight the differential effects of taxes across horizontal and vertical strategies. While this has generated a number of papers aiming to distinguish between different strategies pursued by MNEs (e.g. Markusen and Maskus, 2002; Braconier *et al.*, 2005), this literature has been limited by the inability to directly separate horizontal from vertical motivations. In this regard, Alfaro and Charlton (2009) have made significant progress; they suggest that the identification of the strategies of multinational integration warrants detailed information about the industry segments and the vertical relatedness between the different units forming a MNE. Using firm level data for the year 2005, Alfaro and Charlton (2009) highlighted that, particularly between developed countries, vertical strategies are more pervasive than previously thought. However, Alfaro and Charlton (2009) restrict the classification to horizontal and vertical integration in the manufacturing sector and do not explicitly highlight the changes in the composition of these strategies across time.

A voluminous literature on foreign direct investment (FDI) has also noted the differences between horizontal and vertical strategies when a firm establishes control in a subsidiary located abroad. The seminal contributions on this issue, which include Helpman (1984), Brainard (1997), Markusen and Venables (1998), Yeaple (2003), among many others, suggests that a combination of market size, trade costs, and relative factor endowments affect the pattern of horizontal and vertical FDI strategies: in a nutshell, horizontal FDI should be driven by market size considerations whilst vertical FDI should arise between countries with relatively different factor endowments, which give rise to differences in e.g. labor cost. A number of recent empirical studies have addressed such issues with data on CBAs. While there are maybe some differences in the interpretation of FDI when it occurs in the form of acquisitions or greenfield investment, nevertheless, CBAs often constitute the main form of FDI[1] and, with data being increasingly available for a large number of countries, have been an important source for empirical studies. Recent examples include Erel *et al.* (2011), Huizinga and Voget (2009), Courdacier *et al.* (2009) and Di Giovanni (2005) among others. However, the differences in the strategies that may underly a foreign acquisition are either ignored or incompletely addressed. As already mentioned above, Hijzen *et al.* (2008) and Courdacier *et al.* (2009) have only considered the distinction between horizontal and non-horizontal CBAs and remain agnostic about the potential vertical linkages between industrial activities. Furthermore, they also ignore the fact that MNEs are often highly diversified companies in the sense of operating in more than one industry. Therefore, to separate CBAs driven by horizontal, vertical, or conglomerate strategies requires detailed

[1] Di Giovanni (2005), Head and Ries (2008), and Hijzen *et al.*, (2008) give evidence on the dominance of CBAs in FDI.

knowledge about *all* the industrial linkages between the acquiring and target firm.

Against this background, this paper extends contributes to the literature by uncovering the empirical importance of horizontal, vertical, and conglomerate strategies from cross border acquisitions (CBAs) both across countries and over time. The main benefit of our CBAs data is that each deal is reported with the industries in which the acquiring and target firm are operating. Similar to Alfaro and Charlton (2009), the detailed industrial information provides the stepping stone to directly infer the horizontal and vertical linkages between the merging firms for each reported deal. By using a panel of data with an almost universal coverage of CBAs between 31 source and 58 host countries during 21 years, coupled with our method of vertical relatedness to classify the nature of the acquisition at the firm level, the paper offers a number of new insights. First, depending on the parametrisation to determine vertical relatedness, around 10 to 20 per cent of all deals involve some combination of horizontal and vertical motives whereas between 20 and 40 per cent of all deals seem to be conglomerate, that is the acquiring and target firms neither share the same industry nor are they linked through the supply chain. Hence, we highlight the importance of conglomerate CBAs. Second, since our CBA data come in form of a dated panel covering the 1990 to 2011 period we can provide evidence about the development of the different strategies across time. This gives rise to several observations that have, to our knowledge, not yet been made. Specifically, despite the well-known wave-like fluctuations in overall CBA activity, the number of horizontal and vertical deals has remained relatively stable. Rather, the surges are sustained by conglomerate CBAs that are more volatile and react strongly to international valuation differences (in particular, when we separate mis-pricing from wealth effects). This is perhaps not surprising since our data suggest that financial firms are an important, though by far not the only, segment involved in conglomerate acquisitions abroad. Conversely, neither horizontal nor vertical CBAs are significantly driven by valuation effects. Rather, their close association with gradually changing factors such as, respectively, market size and international cost differences might explain the rather stable development of horizontal and vertical CBAs.

The paper is organized as follows. The method to distinguish horizontal, vertical, and conglomerate strategies from CBA data is outlined in Section 2 while Section 3 provides a descriptive overview of the resulting pattern of acquisition strategies. Section 4 outlines the empirical strategy allowing to connect the different strategies extracted from CBAs with established explanatory variables. Section 5 presents the results and explores the role of valuation effects upon conglomerate and other forms of CBAs. Section 6 summarizes and concludes.

2 Distinguishing Horizontal, Vertical, and Conglomerate CBAs

Key to uncovering the distribution of the different strategies pursued by MNEs is to develop a methodology identifying the commercial relationship between the parent firm and the foreign subsidiary where an investment takes place. To obtain an overview of the different

strategies, we have extracted all cross-border acquisitions (CBAs) from Thomson Reuter's SDC Platinum Database, which claims to have recorded virtually all mergers and acquisition deals between companies around the world since 1990.[2] SDC Platinum reports the standard industry classification (SIC) codes of the acquiring and target, denoted here by, respectively, SIC_α and SIC_τ, which provides the basis to identify the horizontal and vertical linkages between the merging firms.[3] In particular, in case $SIC_\alpha = SIC_\tau$, a deal occurs between firms sharing the same industry—a characteristic feature of a horizontal strategy were MNEs replicate production stages in several countries.

However, even a detailed industry classification remains uninformative about the extent of vertical integration. To see why, note that a scenario where an acquisition occurs across industries, that is $SIC_\alpha \neq SIC_\tau$, does not automatically imply that firms are connected through the supply chain, since such a deal could also involve an acquirer and target that have, with respect to the industries in which they operate, nothing in common. To establish whether merging firms are vertically integrated necessitates additional information on the upstream and downstream linkages across industries. For this, we draw on the results of Fan and Lang (2000) as well as Fan and Goyal (2006) who—following earlier work of McGuckin (1991) and Matsusaka (1996)—have established the vertical relatedness for a matrix containing around 500 industries based on the upstream and downstream value flows between them. In particular, from US input-output tables, they have calculated a so-called coefficient of vertical relatedness, denoted here by $V_{\alpha\tau}$, in terms of the fraction the input industry α contributes in added-value to the output of industry τ.[4] We match this coefficient of vertical relatedness with the four-digit SIC codes of the acquiring and target firm for each deal we extract from SDC Platinum. This methodology is similar to the one used in Alfaro and Charlton (2009) to classify the vertical relationship between plant level observations recorded in the WorldBase database as well as by Acemoglu *et al.* (2009) and Garfinkel and Hankins (2011) in addressing the factors that determine vertical integration. A classification of our CBA deals necessitates the specification of a cut-off value, denoted by $\overline{V}$, above which industries would be deemed vertically related. Fan and Goyal (2006, pp.882-883) consider a cut-off of 1% as well as a stricter value of 5% whilst Alfaro and Charleton (2009) and Acemoglu *et al.* (2009) use 5% and 10% to define vertical relatedness. Garfinkel and Hankins (2011) consider only the relatively low 1% cut-off level. Our baseline results will draw on the intermediate value of 5%. However, to trace out the effect on the distribution

[2]SDC Platinum data has been used elsewhere in Rossi and Volpin (2004), Di Giovanni (2005), Kessing *et al.* (2007), Herger *et al.* (2008), Hijzen *et al.* (2008), Coerdacier *et al.* (2009), Erel *et al.* (2012), and Garfinkel and Hankins (2011) to study various aspects of CBAs.

[3]As any classification system, SIC codes offer more or less aggregate levels to delimit industries ranging from a crude definition involving broad groups such as mining, manufacturing, or services at the one-digit level to a much more detailed classification encompassing around 1'500 primary economic activities at the four-digit level. To accurately identify investment strategies pursued by MNEs, we follow Alfaro and Charleton (2009) who advocate the use of a fairly disaggregated classification at the four-digit level.

[4]The US input-output tables are updated every 5 years to account for industrial and technological changes. However, Fan and Goyal (2006, p.882) find that the usage of input-output tables of different years has only a modest impact upon their results. Hence, we assume that these vertical relatedness coefficients hold over time which is consistent with the recent work of Alfaro and Chen (2012). Furthermore, using US input-output tables to define the vertical relatedness for a worldwide sample of MNEs, as is also done in Acemoglu *et al.* (2009), raises another issue whether this accurately reflects the technological conditions around the globe. To account for this, the sensitivity analysis of the results of section 5 contains a robustness check with a sub-sample involving only US MNEs.

of different FDI strategies, as robustness checks, the results will be replicated with the alternative cut-off values.[5]

Another challenge in determining horizontal and vertical strategies is that the acquiring or target firms often operate in several industries. Within the present context, accounting for the possibility of multi-segment business activity is important since large MNEs operate often in several industries. In our sample, the acquiring firms are more diversified than the target firms in terms of reporting, on average, activity in around three and around two industries, respectively. Therefore, although the SDC database reports a primary SIC, we cannot be sure that, say, the absence of an overlap between these (primary) codes rules out a horizontal relationship, since a replication of production activities could also occur with some other industry segment of a diversified firm. To account for this, we search for horizontal and vertical connections between all permutations of the up to 6 different SIC codes reported for each deal by SDC Platinum.[6] Taken together, as with Alfaro and Charlton (2009), comparing the industries as well as drawing on the vertical relatedness between the acquiring and target firm provides a direct way to identify the importance of alternative strategies of multinational integration. Specifically, denoting the up to 6 industries of the acquiring firm with $\rho = \{1, 2, 3, 4, 5, 6\}$ and the industries of the target firm with $\sigma = \{1, 2, 3, 4, 5, 6\}$, gives rise to up to 36 pairs to establish a horizontal, that is $SIC_{\alpha}^{\rho} = SIC_{\tau}^{\sigma}$ or vertical relationship, that is $V_{\alpha\tau}^{\rho\sigma} > \overline{V}$. These pairs define the following strategies:

- **Pure Horizontal**, that is deals where the firms share at least one pair of the same four-digit SIC code, but are never vertically related;
- **Pure Vertical**, that is deals where the acquirer and target operate in different industries, but share at least one pair of SIC codes exceeding the threshold value defining vertical relatedness;
- **Conglomerate**, where, across all the 36 possible combinations of SIC codes, a deal involves firms that neither share the same industries nor are vertically-related; and a
- **Residual**, where it is not clear whether a deal is driven by a horizontal or vertical motive (or both).

Table 1 summarizes the definition of the various FDI strategies that can be identified by means of our CBA data.

Inevitably, the definition of horizontal and vertical strategies of Table 1 is not unambiguous, but, as discussed above, depends on such things as the adopted cut-off value defining vertical relatedness or the level of detail of the industry classification. Furthermore, aside from the pure cases of horizontal and vertical deals that are commonly discussed in the international

[5] Within a given supply chain, vertical relatedness can arise due to commodity flows with upstream $v_{\alpha\tau}^{u}$ and/or downstream $v_{\alpha\tau}^{d}$ activities. Following Fan and Goyal (2006, p.881), in our baseline scenario, no distinction will be made between these cases in the sense that the maximum value determines the coefficient of vertical relatedness, that is $V_{\alpha\tau} = max(v_{\alpha\tau}^{u}, v_{\alpha\tau}^{d})$

[6] Another possibility to avoid the pitfalls when MNEs operate in several industries is to focus on CBA deals where both the acquirer and target firm report only one SIC code. However, this sub-sample includes less than 20 per cent of all deals and will, hence, only be considered for our sensitivity analysis in section 5.

Table 1: Strategies of Cross-Border Acquisition

Strategy	*Horizontal Relatedness*	*Vertical Relatedness*	*Description*
Pure Horizontal	$\exists \rho, \sigma \vert SIC_{\alpha}^{\rho} = SIC_{\tau}^{\sigma}$	$V_{\alpha\tau}^{\rho\sigma} < \overline{V} \; \forall \; \rho, \sigma$	Replication of production by acquiring a foreign facility in the same industry and on the same stage of the supply-chain.
Pure Vertical	$SIC_{\alpha}^{\rho} \neq SIC_{\tau}^{\sigma} \; \forall \; \rho, \sigma$	$\exists \rho, \sigma \vert V_{\alpha\tau}^{\rho\sigma} > \overline{V}$	Fragmentation of production by acquiring a foreign facility in a different industry and production stage but located within the same value-chain.
Conglomerate	$SIC_{\alpha}^{\rho} \neq SIC_{\tau}^{\sigma} \; \forall \; \rho, \sigma$	$V_{\alpha\tau}^{\rho\sigma} < \overline{V} \; \forall \; \rho, \sigma$	The merging firms are neither horizontally related through sharing the same industry nor are they vertically connected through the supply-chain.
Residual	$\exists \rho, \sigma \vert SIC_{\alpha}^{\rho} = SIC_{\tau}^{\sigma}$	$\exists \rho, \sigma \vert V_{\alpha\tau}^{\rho\sigma} > \overline{V}$	Cases where either the classification is unclear (or the multinational firm pursues a complex strategy).

economics literature, other contingencies arise that do not reflect the somewhat crude distinction between uniquely market-access and endowment seeking acquisition. Specifically, this encompasses a conglomerate case where no industrial relationship could be found. Furthermore, based on our classification method, deals can exhibit both a horizontal and a vertical relationship. This case arises since we are looking for industrial connections across all combinations of SICs reported by the acquiring and target firm involved in a given deal. Since this might reflect a scenario where our classification is not clear cut, this possibility is referred to as a "residual".[7,8]

3 An Overview of CBAs between 1990 and 2011

For the 1990 to 2011 period, this section provides a descriptive overview of our sample with 165,106 CBAs reported by SDC Platinum during that period. The descriptive overview, as well as the econometric analysis of Sections **??** and 5, focus on the number of observed deals rather than their value. This is because in more than half of the cases, the deal value has not been disclosed by the merging companies[9], so the coverage of number of observed deals is much more complete. However, the number of deals follows by and large the observed pattern of the value data (Hijzen *et al.*, 2008, pp.852ff; Erel *et al.*, 2012, pp.1053ff.).

Our sample includes all deals by MNEs headquartered in one of the 31 source countries[10]

[7] A strand of the literature starting with Yeaple (2003) has suggested that MNEs could pursue complex strategies combining horizontal and vertical motives. This would provide an additional explanation for finding deals where some SIC-codes overlap and some relationship through the supply chain can be found.

[8] Considering deals between single business firms discussed in footnote 7 eliminates again the contingency of finding acquisitions meeting both criteria defining horizontal and vertical integration.

[9] See also Di Giovanni (2005, p.134).

[10] The country where a MNE is headquartered is here considered to be the *ultimate* source country reported in SDC. This might matter when acquisitions occur through complex ownership chains. However, in around 80 per cent of the deals in our sample, the immediate and ultimate source country are identical.

listed in the data appendix. These source countries account for more than 95 per cent of all deals reported in SDC during the period under consideration. The left column of the top panel of Table 2 reports the top-ten source countries for CBAs. A handful of large and developed source countries including the United States, the United Kingdom, Canada, Germany, and France account already for more than 50 per cent of all deals. Furthermore, the Netherlands, Sweden, and Switzerland, which belong to the economically and financially most developed countries, are also important sources of international merger activity. Comparing the top-ten source with the largest host countries at the bottom left of Table 2 reveals a similar degree of concentration and a noteworthy overlap that has also been documented with other FDI data (see e.g. Brainard, 1997, pp.525-526, Markusen, 2002, p.6). The main difference between the most important source and host countries is that emerging markets such as China and some large southern European countries such as Spain and Italy replace the above mentioned small developed countries when reporting the main recipients of CBAs.

Following the classification procedure outlined in Section 2, Table 3 shows the distribution of CBA deals in our sample across the different FDI strategies. Our sample suggests that the proportion of horizontal and vertical motives when MNEs integrate foreign affiliates depends crucially on the cut-off value $\overline{V}$ defining vertical relatedness. In particular, with a relatively strict value of 10%, horizontal deals dominate. The opposite result arises when considering a cut-off of 1%, where 55 per cent of all deals are considered to be vertical, which coincides with the proportion reported by Garfinkel and Hankins (2011, p.520) for a sample with US multinationals. The shifts in the empirical importance of strategies across different values of $\overline{V}$ underscores the need to consider, as a sensitivity check, alternatives to the 5% cut-off value.

In spite of the theoretical dominance of horizontal and vertical modes in the international economics literature, regardless the criterion to define vertical relatedness, Table 3 shows that such strategies account only for roughly one half of the deals in our sample of CBAs. In particular, even when using a lenient 1% cut-off for $\overline{V}$, about one fifth of the deals are still considered to be conglomerate with much higher proportions arising with stricter values: with the 10% cut-off, the proportion of vertical deals falls while conglomerate deals account for over 40 per cent of the total sample of CBAs. To our knowledge, the international economics literature has by and large ignored the possibility that a considerable proportion of MNEs could pursue conglomerate strategies when investing abroad.

Figure 1 summarizes the distribution of CBAs across industries. In particular, the y-axis relates to the two-digit primary SIC code of the acquiring firm plotted against the two-digit primary SIC code for the target firm on the x-axis. The surface of the marker represents the proportional weight of the number of CBAs in a given combination of industries relative to the total number of CBAs. Intra-industry deals, defined as those that do not cross the two-digit SIC code between acquiring and target firm, are located on the main diagonal and are marked with boldface circles. Off-diagonal markers, with normal circles, indicate the importance of inter-industry deals occurring between broadly defined activities or even across sectors. The industries are arranged according to their SIC code meaning that the

Table 2: Top-Ten Source and Host Countries

Source Countries

Rank	# All CBAs		# Horizontal CBAs		#Vertical CBAs		#Mixed CBAs		#Conglomerate CBAs	
1.	United States	40,209	United States	6,548	United States	11,944	United States	6,593	United States	15,124
2.	United Kingdom	20,973	United Kingdom	4,367	United Kingdom	5,416	United Kingdom	3,065	United Kingdom	8,125
3.	Canada	13,053	France	2,902	Canada	4,339	Canada	2,773	Canada	3,917
4.	Germany	11,520	Germany	2,347	Germany	3,309	Germany	1,997	Germany	3,867
5.	France	11,111	Canada	2,024	France	2,929	France	1,974	France	3,306
6.	Netherlands	7,452	Netherlands	1,562	Japan	2,237	Japan	1,224	Netherlands	2,586
7.	Japan	6,690	Sweden	1,424	Netherlands	2,162	Netherlands	1,124	Japan	2,411
8.	Sweden	5,931	Switzerland	1,165	Switzerland	1,596	Australia	1,096	Hong Kong	2,346
9.	Switzerland	5,757	Italy	895	Sweden	1,583	Sweden	1,053	Switzerland	2,010
10.	Australia	5,117	Australia	842	Australia	1,485	Switzerland	986	Sweden	1,871
	...	...	...	...	...	...	...	...	...	...
	Total	165,106	Total	31,772	Total	40,093	Total	34,425	Total	58,816

Host Countries

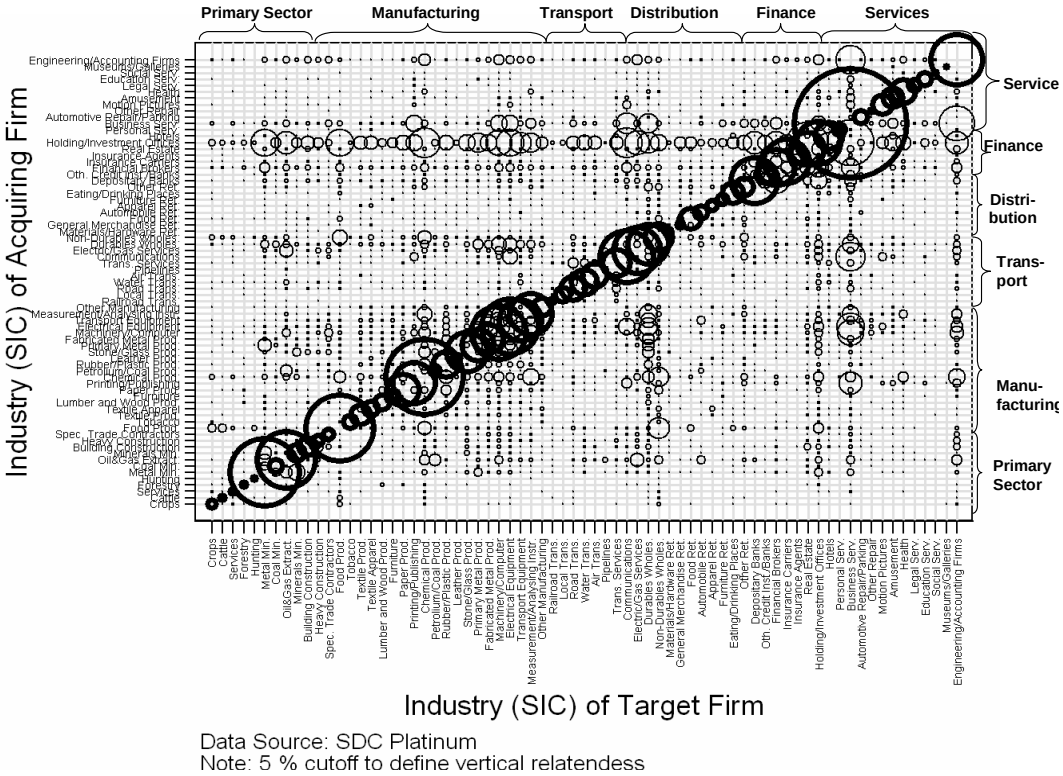
Rank	# All CBAs		# Horizontal CBAs		#Vertical CBAs		#Mixed CBAs		#Conglomerate CBAs	
1.	United States	26,100	United States	4,746	United States	7,968	United States	4,487	United States	8,899
2.	United Kingdom	15,695	United Kingdom	3,038	United Kingdom	4,726	United Kingdom	2,600	United Kingdom	5,331
3.	Germany	12,144	Germany	2,246	Germany	3,514	Germany	1,899	Germany	4,485
4.	Canada	9,342	France	1,687	Canada	2,611	Canada	1,599	Canada	3,521
5.	France	8,639	Canada	1,611	France	2,372	France	1,363	France	3,217
6.	China	5,923	Spain	1,228	China	1,662	China	993	China	2,575
7.	Australia	4,925	Italy	992	Australia	1,472	Italy	803	Australia	1,972
8.	Spain	4,924	Sweden	897	Netherlands	1,334	Spain	758	Italy	1,766
9.	Italy	4,838	Netherlands	861	Italy	1,277	Australia	737	Spain	1,724
10.	Netherlands	4519	Australia	744	Sweden	1,237	Netherlands	733	Netherlands	1,591
	...	...	...	...	...	...	...	...	...	...
	Total	165,106	Total	31,772	Total	40,093	Total	34,425	Total	58,816

Table 3: Proportion of CBA Strategies across different values of $\overline{V}$

Cut-off ($\overline{V}$)	Pure Horizontal	Pure Vertical	Conglomerate	Residual
1%	8%	55%	20%	17%
5%	19%	24%	36%	21%
10%	35%	11%	44%	10%

primary sector—that is agriculture, mining, and construction—appears on the bottom left followed by the manufacturing sector, transportation, wholesaling and retailing (distribution), financial services, and other services at the top right. Note that with the exception of financial firms and parts of the wholesaling and retailing sector, most of these acquisitions are intra-industry in nature.

Figure 1: Industrial Composition of CBAs, All Deals (165,106 Deals)

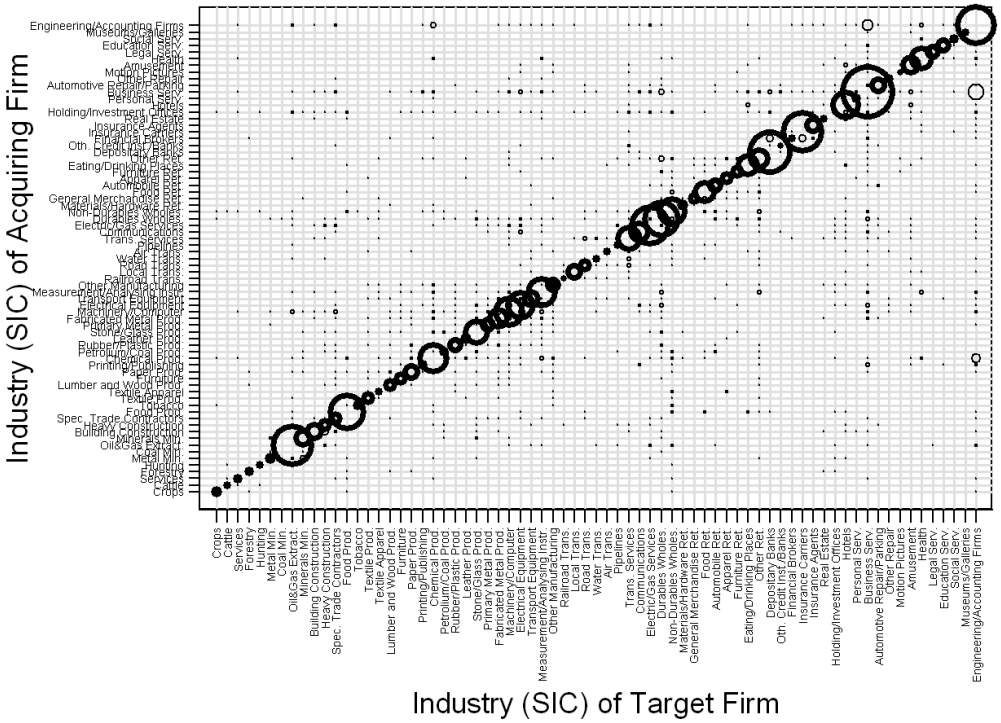


As regards the group of pure horizontal deals, Table 2 reports the corresponding top-ten source and host countries. Compared with the full sample, the ranking changes barely with pure horizontal CBAs involving again mainly large developed countries. The main exceptions are that Japan is replaced by Italy and China by Sweden in the list of, respectively, the 10 most important source and host countries. Within the context of the theoretical literature on the MNE, this dominance of large and developed countries is perhaps not surprising since horizontal strategies are primarily thought to be market-access seeking meaning that countries with similar factor endowments and large domestic markets ought to be the

primary target for multinational integration.

With the surface of the markers representing again the weight relative to the total number of deals, Figure 2 displays the industrial composition of CBAs classified according to the method of section 2 as 'pure horizontal'. Intuitively, almost all of these deals lie on the diagonal; that is they are intra-industry in terms of occurring between firms sharing the same two-digit primary SIC code. Though horizontal deals off the main diagonal can arise since the overlapping industries could also involve business segments that are not the primary activity of an acquiring or target firm, within the current sample, this scenario is empirically unimportant. In manufacturing, horizontal deals within food production (SIC 20), chemical products (SIC 28), measurement and precision instruments (SIC 38), commercial machinery (SIC 35), and electrical equipment (SIC 36) are the most important. Though the manufacturing sector accounts for a substantial share of horizontal CBAs, this strategy is also pursued elsewhere. In particular, a substantial amount of acquisitions in firms replicating activities abroad arise also with business services (SIC 73), engineering and accounting firms (SIC 87), and hotels (SIC 70) in the services sector, depository banks (SIC 60) and insurance carriers (SIC 63) in finance, wholesaling (SIC 50, 51) in the distribution sector, electric, gas and sanitary services (SIC 49) in the transportation and public utilities sector, or oil and gas extraction (SIC 13) in the primary sector.

Figure 2: Industrial Composition of Horizontal CBAs (31,771 Deals)



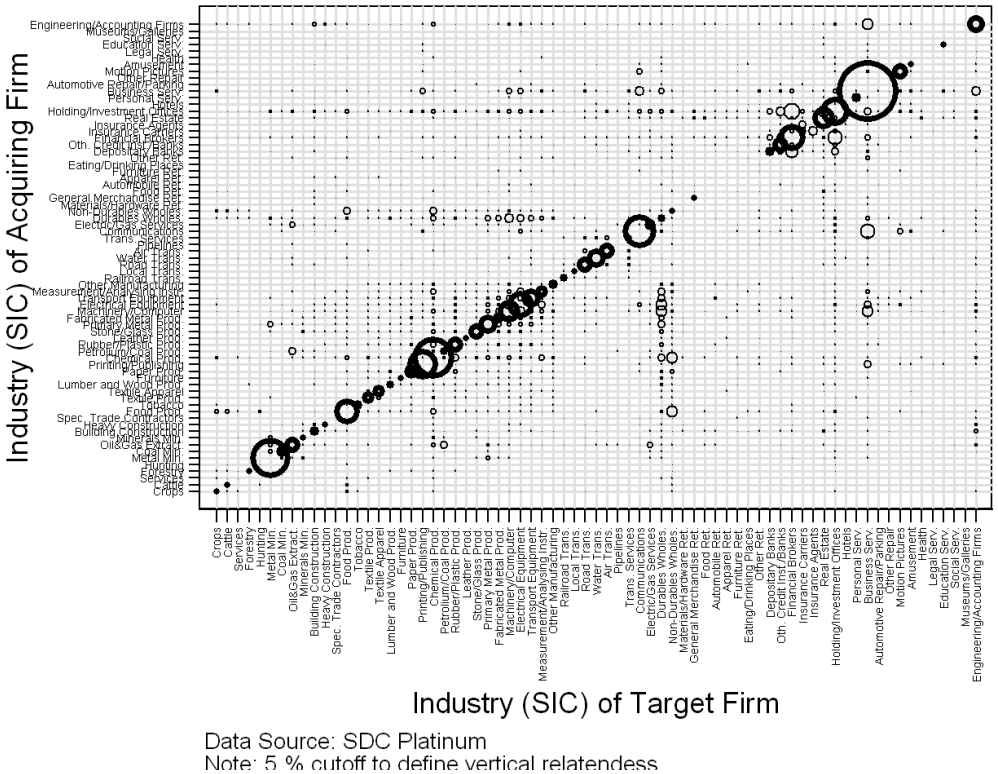
Less consistent with conventional theories of the MNE is that, as shown in Table 2, economically developed source *and* host countries dominate in CBAs involving acquiring and target firms that operate on different stages of the same supply chain. In contrast to this, theories about vertical integration such as that of Helpman (1984) or Markusen (2002) suggest such CBAs to be driven by the desire to exploit relative endowment differences and, hence, should mainly involve host countries with different factor endowments and lower wage cost. By and large, the top-ten hosts for vertical deals reported in Table 2 do not fall into the group of low-wage countries. The only exception is China that might attract deals motivated by the desire to outsource labor intensive production stages. This pattern concurs, however, with Alfaro and Charlton (2009), who concluded that substantial parts of FDI between developed countries are driven by a vertical strategy.

Figure 3 depicts the industrial composition of the deals classified as pure vertical according to the method of section 2 using again the 5% cut-off level. Though, compared with horizontal CBAs, the markers are slightly more dispersed, the bulk of deals involving firms that operate on different stages of the same supply chain still lies on the main diagonal marked by the bold circles representing intra-industry activity. For the case of vertical acquisitions, these are firms that operate on slightly different production stages within the same two-digit SIC code. The empirical dominance of vertical integration occurring "intra-industries" was first observed by Alfaro and Charlton (2009) by looking at the manufacturing sector. However, in our more comprehensive sample, intra-industry CBAs do not only arise in large numbers in the manufacturing sector—mainly within chemical products (SIC 28), electrical equipment (SIC 36), printing and publishing (SIC 27), or food production (SIC 20)—but also elsewhere, including in business services (SIC 73), communications (SIC 49), metal mining (SIC 10), or financial brokers (SIC 62) and holding companies (SIC 67) in the finance industry.[11]

As noted above, most of the international economics literature focuses on the distinction between horizontal and vertical FDI whereas conglomerate strategies draw rarely attention. In contrast, against the background of an alleged conglomerate domestic merger wave in the US during the 1960s and 1970s (see e.g. Matsusaka, 1996), the possibility of diversifying mergers and acquisitions has received more attention in the finance and industrial organization literature. Instead of exploiting synergies between industries when replicating production processes in several locations or outsourcing production stages to low wage countries, financial frictions (e.g. Williamson, 1970) or corporate governance problems manifesting themselves in principal-agent issues between shareholders and management (e.g. Amihud and Lev, 1981; Williamson 1981, pp.1557ff.; Mueller, 1969) provide, arguably, motives for conglomerate mergers and acquisitions. When analysing the empirical distribution of CBAs, as far as we are aware, financial and corporate governance motives have by and large been

[11] CBAs involving the distribution and retailing sector are relatively rare, which manifests itself in a gap in the markers along the diagonal of Figure 3. Referring back to the observation of footnote 6 that a vertical relationship can arise with the upstream and the downstream activities, this may matter: Conventional theories of the MNE summarized in the 'knowledge-capital' model (Markusen, 2002) connect the motives for vertical integration with endowment-seeking. However, the (forward) integration of a distribution network might be driven by market access considerations that have more in common with motives that are usually attributed to horizontal strategies. Though such cases are empirically unimportant, a robustness check will be carried out in Section 5 distinguishing between cases where the vertical relationship arises only with, respectively, the upstream and downstream stages of the supply chain.

Figure 3: Industrial Composition of Vertical CBAs (40,093 Deals)

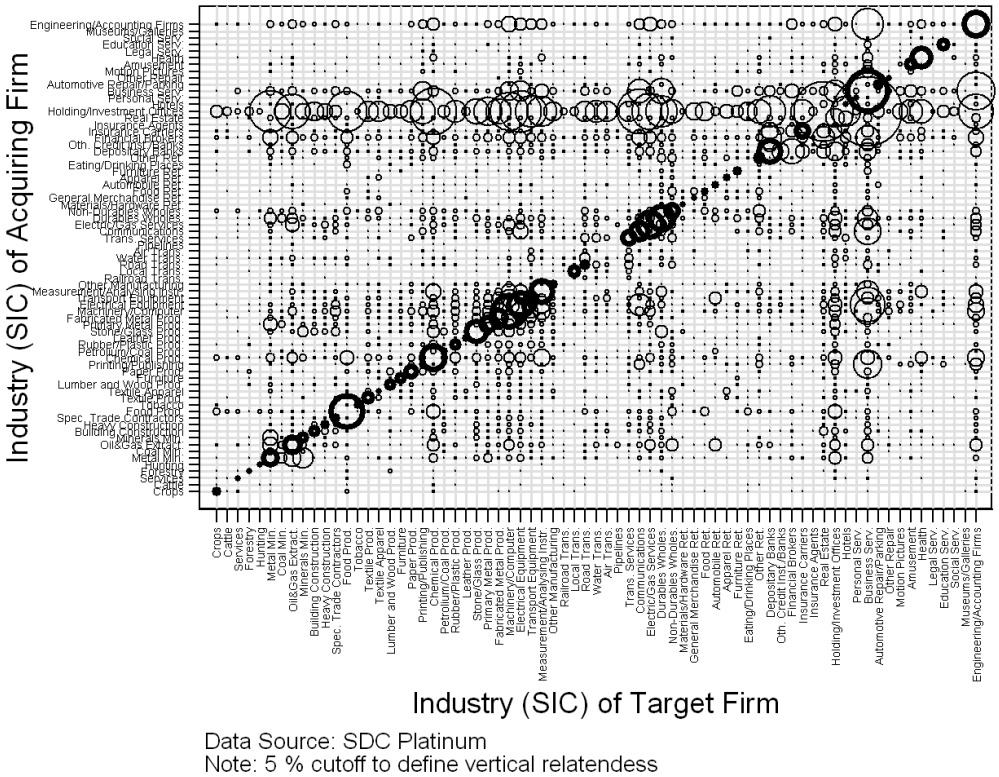


neglected. Exceptions to this include Rossi and Volpin (2004), who suggest that acquisitions involve often host countries with poorer shareholder protection than the source country and, hence provides a vehicle to export high corporate governance standards. Furthermore, Erel *et al.* (2011) suggest that CBAs can be a reflection of financial arbitrage arising in incompletely integrated capital markets. Owing to their size, MNEs could indeed play a role in acquiring undervalued firms abroad (see also Baker *et al.*, 2008). However, neither of these papers suggests that corporate governance or valuation effects could be particulary relevant to explain conglomerate CBAs that, by definition, cannot give rise to industrial synergies.

Recall from Table 3 that a substantial number of our CBA deals appear to be conglomerate in nature. Using the method of section 2 with the 5 % value for $\overline{V}$, Figure 4 displays the industrial composition of the more than 58,000 deals classified as conglomerate. In general, compared with horizontal and vertical CBAs, the resulting pattern exhibits more dispersion across different sectors and industries and involves substantial inter-industry activity. This is perhaps not surprising since the distinctive feature of conglomerate strategies is diversification in terms of combining firms that operate in entirely different industries. Compared with the previous figures, another obvious difference is that many conglomerate deals involve the finance sector. Particularly dominant are holdings and investment offices (SIC 67) as an acquirer with targets located across all sectors.

One advantage of our panel data on CBAs is that, in contrast to the cross section employed

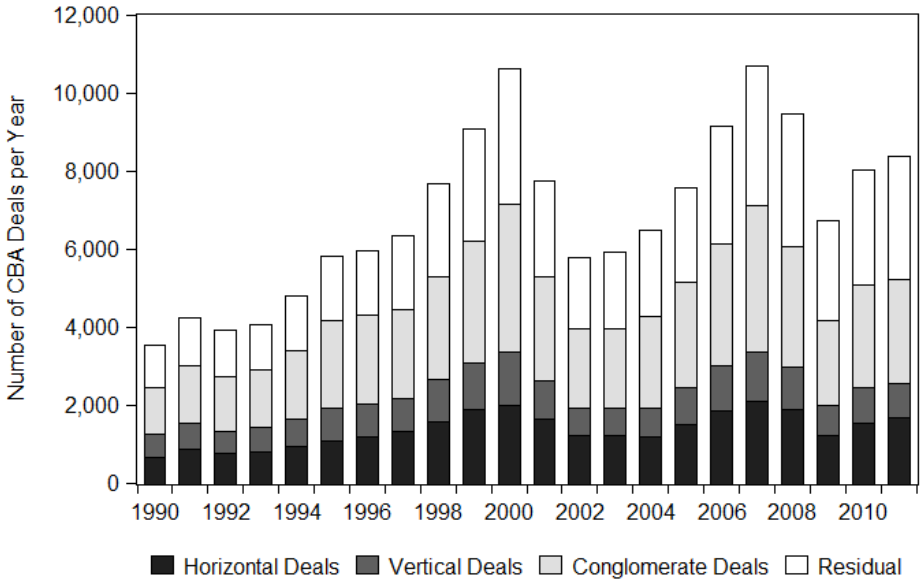
Figure 4: Industrial Composition of Conglomerate CBAs (58,816 Deals)



by Alfaro and Charlton (2009), the evolution of the different strategies pursued by MNEs can be traced over time. Figure 5 depicts this development for the 1990-2011 period. One of the features of globalisation in recent decades has been the wave-like growth of international mergers and acquisitions. Note that the merger-waves peaked in the year 2000 around the bursting of the Dotcom bubble and again in 2007 with the beginning of the global financial crisis. Within the present context, it is perhaps worth noting that the observed international merger waves are unlikely to be driven by the determinants commonly associated with horizontal or vertical strategies. The reason is that variables such as market size or differences in factor cost change gradually rather than exhibiting dramatic upsurges that come to an abrupt end.

Figure 5 shows that horizontal and vertical FDI have been relatively constant over the whole period. There were around 600 to 800 horizontal deals per year at the beginning of the 1990 which doubled to around 1500 deals at the end of the sample period. Vertical deals grew even less from around 600 deals per year to around 1000 deals during the period under consideration. Conversely, conglomerate acquisitions more than doubled from around 1000 deals to around 2500 deals. Also, conglomerate deals contributed more to each merger wave. In particular, during the 1990, they increased by around a factor of 3 whilst horizontal and vertical deals increased "only" by around a factor of 2. Between 2002 and 2007, the number of conglomerate CBAs almost doubled whilst the growth in horizontal and vertical

Figure 5: CBAs Over Time and Their Composition: 1990-2011



acquisitions was closer to a factor of 1.5.

4 Econometric Strategy: Location Choice and the International Market for Corporate Control

4.1 Background

As discussed above, CBAs are by far the most common form of FDI and the data on the corresponding deals—that are henceforth indexed with $i = 1, \ldots, N$—are available on an almost universal basis. Also, the acquisition of a foreign firm can be seen as an event uncovering a location choice. To formalize such choices, Head and Ries (2008) model FDI as an outcome of the (international) market for corporate control. Specifically, to be able to outpay potential rivals during a bidding contest in year t, an acquiring MNE headquartered in source country s should derive the highest value $\nu^i_{sh,t}$ from taking over a target firm in host country h. This implies that the probability of a CBA deal between a given source and host country follows an extreme value distribution, such as the multinomial logit distribution used in Head and Ries (2008), to identify the MNE with the highest ability to pay (see also Hijzen *et al.*, 2008, p.857). Hence, as shown in this section, modelling FDI as an outcome of the market for corporate control connects naturally with the conditional logit framework that is commonly used to empirically study the firms' location choice problem (see e.g. Guimarães *et al.*, 2003).

Assume that the value $v^i_{sh,t}$ that an MNE headquartered in source country s can obtain

from a CBA deal i in year t with a target firm located in host country h depends, among other things, on a set of variables $x_{sh,t}$ according to the equation

$$\nu^i_{sh,t} = x'_{sh,t}\beta + \delta_s + \delta_h + \delta_t + \delta_i + \epsilon^i_{sh,t} \quad \text{with} \quad \begin{array}{l} i = 1, \ldots, N; \\ s = 1, \ldots, S; \\ h = 1, \ldots, H; \\ t = 1, \ldots, T \end{array} \tag{1}$$

where β are coefficients measuring the direction and magnitude of the impact. Here, $\epsilon^i_{sh,t}$ is a deal specific error term, to be specified below, that accounts for the stochastic uncertainty when an MNE gauges the future value of acquiring a foreign firm. To accommodate for panel data, (1) includes a full set of constants pertaining to the firms involved in a given deal δ_i, source country δ_s, host country δ_h, and year δ_t.

To reflect the differences between investment strategies, $x_{sh,t}$ includes variables associated with the motives for horizontal and vertical integration. Here, the real GDP of the host country is used to capture the market access motive. For CBAs driven by a horizontal strategy, GDP is expected to produce a positive sign.[12] Conversely, differences in the cost and endowment of production factors such as labor provide the determinant associated with vertical strategies. To capture this, Carr *et al.* (2001) employ international skill differences measured by an index of occupational categories. Arguably, this approach suffers from several caveats. Firstly, the sign reversals between cases where the source or host country is skill abundant make it difficult to interpret the coefficient of international skill differences (Blonigen *et al.*, 2003). Secondly, national idiosyncracies in labor market regulations, taxation, or social security contributions could drive a wedge between factor endowments and the factor costs that, ultimately, affect an MNEs decision to relocate a production stage. Based on this observation, Braconier *et al.* (2005, pp.451ff.) connect vertical FDI directly with international wage differences between skilled and unskilled labor. Thereto, they draw on the Prices and Earnings data of UBS (various years) which provides a unique survey of the salaries of various professions in the capital city or the financial center of a large number of countries. Following Braconier *et al.* (2005, pp.451ff.), for each host country, we have calculated the skilled wage premium SWP by taking the ratio between the wage of a skilled profession—taken to be engineers—and an unskilled profession—taken to be a toolmaker in the metal industry. A high value of SWP indicates that skilled labor is relatively scarce and, in turn, expensive compared with unskilled labor. For vertical deals, SWP is expected to have a positive effect indicating that countries with relatively cheap unskilled labor lend themselves to hosting labor intensive stages of the supply chain.[13]

[12] Carr *et al.* (2001) use the sum of the GDP between of the source and host country to capture the joint market size. However, since our specification includes a source country dummy variable δ_s absorbing the effect of the home market size, employing the sum of the GDP between of the source and host country yields an identical coefficient estimate.

[13] UBS (various years) also reports an index summarizing the labor cost across all 13 surveyed professions. This WAGE INDEX will be used as robustness check when testing the nexus between labour cost and vertical CBAs in Section 5.

The following variables are conventionally used to control for other determinants affecting a MNEs' desire to acquire a foreign subsidiary. Since it is arguably less costly to monitor affiliates in nearby countries (Head and Ries, 2008), geographic proximity, measured by the DISTANCE between capital cities, and cultural proximity, measured by common LANGUAGE dummy variable, is thought to foster CBAs. Furthermore, trade cost and regional economic integration also matters though the corresponding effect is ambiguous. In particular, a reduction in trade barriers increases the scope to serve a market by exports instead of local production, and hence undermines (horizontal) CBAs, whilst economic integration facilitates the fragmentation of a production process and ship intermediate goods across the border, which would foster (vertical) CBAs (see Hijzen *et al.*, 2008). We control for such effects by introducing a dummy variable for country-pairs located within the same customs union (CU) as well as a measure of TRADE FREEDOM within a given host country to proxy for the existence of formal and informal trade barriers. The political and legal environment matters in the sense that MNEs are probably reluctant to invest in countries with weak property rights for foreign investors, which is measured by an index on INVESTMENT FREEDOM. Aside from the quality of formal rules protecting foreign investors, their enforcement might also matter. Wei (2000) finds indeed evidence that endemic CORRUPTION deters FDI.[14] High CORPORATE TAXES in the host country relative to the source country could deter CBAs. The real EXCHANGE RATE affects the relative price of a foreign acquisition (Froot and Stein, 1991). In particular, the cost of a CBA increase with the relative value of the host country currency meaning that the expected effect is negative. Finally, the period under consideration has witnessed the creation of the EURO zone, for which we control with a dummy variable (compare Coerdacier *et al.*, 2009). The data appendix contains an overview and a detailed description of all variables.

Since the possibility of diversification is largely ignored in the international economics literature, we are more agnostic about the theoretical priors for some FDI determinants when considering their impact on conglomerate acquisitions. For example, economic integration or improving institutional quality could facilitate the acquisition of foreign subsidiaries, but also eliminate some of the frictions creating arbitrage opportunities for MNEs. Likewise, economically large countries have more firms providing cross-border arbitrage opportunities, but also imply that MNEs must compete with more domestic firms, with better access to information about the local economic and political conditions, when making an acquisition. Furthermore, the identification of undervalued firms that lend themselves to financial arbitrage via CBAs is maybe a skilled-labor intensive activity and could hence respond to international wage differences. As noted in Section 3, financial firms that are often located in financial centers with an abundant supply of skilled labor are indeed dominant acquirers in conglomerate CBAs. However, to uncover evidence on the conjecture that financial arbitrage is a particularly important motive for conglomerate CBAs, we will follow the work of Erel *et al.* (2011) and employ the difference of the average market-equity-to-book-equity value ratio of publicly traded companies—or in short market-to-book ratio (MtB)—between

[14] In general, the empirical literature has related FDI to a large number of so-called institutional quality variables. However, most of these dimensions are closely correlated (Daude and Stein, 2007, pp.321ff.) and seem to measure similar effects of whether or not a country has put in place economic, legal, or political mechanisms protecting investors.

source and host country. The expectation is that this yields a positive effect on CBAs, since a higher valuation of the source country companies puts them into the position to outpay foreign rivals when bidding for a target firm abroad. Differences in valuation can arguably arise from two sources. A first component MtB^m reflects mis-pricing arising from errors in the valuation as suggested by Shleifer and Vishny (2003). A second unexpected component MtB^w reflects surprising developments that should come from real wealth effects featuring in Froot and Stein (1991). To calculate these different components, we follow the method of Baker *et al.* (2008) who regress the current MtB onto the future stock market returns.[15] The corresponding fitted value determines MtB^m whilst the residual determines MtB^w. Finally, to uncover the empirical role of corporate governance, Erel *et al.* (2011) and Rossi and Volpin (2004) calculate the difference of a SHAREHOLDER RIGHTS index between the source and host country. The effect is positive when CBAs tend to involve source countries with better corporate governance standards than the host country.

4.2 Location Choices in a Conditional Logit Framework

Equation (1) forms the basis for our empirical strategy. However, only scant data is available on the expected value $\nu^i_{sh,t}$ of an acquisition. Though the price paid for a target firm could provide a proxy for $\nu^i_{sh,t}$, in more than half of the deals, such information has not been reported to SDC Platinum (Di Giovanni, 2005, p.134). Instead, the observation of Head and Ries (2008) that merger deals encapsulate a location choice within the market for corporate control can be used to avoid this missing data problem. Indeed, insofar as a CBA deal identifies the MNE of source country s deriving the highest expected value ν^i_{sht} of investing in host country h in year t, this implies that

$$d^i_{sh,t} = \begin{cases} 1 & \nu^i_{sh,t} > \nu^i_{s'h',t'} \\ 0 & \text{otherwise,} \end{cases} \tag{2}$$

where s', h', t' denotes the choice set of, respectively, alternative source countries, host countries, or years to invest. Hence, location choices $d_{sh,t}$ constitute an almost universally observed variable to uncover the impact of the set of explanatory variables $x_{sh,t}$ upon CBAs. Econometric models that are capable to handle discrete choices include the conditional logit model, where $d^i_{sh,t}$ of (2) is the dependent variable (see e.g. Guimarães *et al.*, 2003). Consistent with the theoretical framework of Head and Ries (2008), conditional logit models draw on the notion that a CBA identifies the MNE with the highest bid ν^i_{sht} implying that the stochastic component $\epsilon_{sh,t}$ of (1) follows a (type I) extreme value distribution. Within the present context, the probability $P_{sh,t}$ of an acquisition involving source country s and host country h during year t is then of the multinomial logit form, that is

$$P^i_{sh,t} = \frac{\exp(x'_{sh,t}\beta + \delta_h)}{\sum_{s=1}^{S}\sum_{h=1}^{H}\sum_{t=1}^{T}\exp\left(x'_{sh,t}\beta + \delta_h\right)}. \tag{3}$$

[15] The resulting regression equation equals $MtB_t = 2.194 - 0.048FR_{t+1} (R^2 = 0.42)$ where FR denotes the future stock market return. With t-values of, respectively, 11.66 and 2.71 both coefficients are significant at any conventionally used level of rejection. Estimation occurred with panel data and fixed effects for 18 countries. Extending the future stock returns to $t+1$ and $t+2$ leaves the results largely unchanged.

Owing to the exponential form of (3), all components δ_i, δ_s and δ_t that are specific to, respectively, a deal i, source country s, or year t drop out. Thus, only variables enter $x_{sh,t}$ that differ across alternative host countries h. The joint distribution over all deals i, source countries s, host countries h, and years t under consideration defines the log likelihood function $\ln L_{cl} = \sum_{i=1}^{N} \sum_{s=1}^{S} \sum_{h=1}^{H} \sum_{t=1}^{T} \ln(P^i_{sh,t})$. A symmetric treatment of deals implies that $P^i_{sh,t} = P_{sh,t}$, such that $n_{sh,t}$ can be factored out, that is $\ln L_{cl} = \sum_{s=1}^{S} \sum_{h=1}^{H} \sum_{t=1}^{T} n_{sh,t} \ln(P_{sh,t})$. Inserting (3) yields

$$\ln L_{cl} = \sum_{s=1}^{S} \sum_{h=1}^{H} \sum_{t=1}^{T} n_{sh,t} x'_{sh,t}\beta - \sum_{s=1}^{S} \sum_{h=1}^{H} \sum_{t=1}^{T} \left[n_{sh,t} \ln \left(\sum_{s=1}^{S} \sum_{h=1}^{H} \sum_{t=1}^{T} \exp(x'_{sh,t}\beta) \right) \right], \quad (4)$$

from which the coefficients β can be estimated.

According to Guimarães *et al.* (2003), a drawback of the conditional logit model is that the estimation of (4) is unpractical when a large number of firms can choose to locate activities in a large number of countries. Indeed, since our sample contains tens of thousands of CBA deals which uncover the discrete choice from dozens of potential host countries, the estimation of a conditional logit model would be burdensome, since it requires the handling of a dataset with millions of observations.[16]

4.3 Empirical Implementation with Poisson Regressions

To avoid the caveats of the conditional logit model, the count variable $n_{sh,t}$ containing the number of deals between source s and host country h during year t can be used as the dependent variable instead of the discrete choice indicator $d^i_{sh,t}$ per CBA deal i (Guimarães *et al.*, 2003). Basic count regressions impose a Poisson distribution on $n_{sh,t}$, that is

$$Prob[n = n_{sh,t}] = \frac{\exp(-\lambda_{sh,t}) \lambda_{sh,t}^{n_{sh,t}}}{n_{sh,t}!}, \quad (5)$$

where $\lambda_{sh,t}$ is the Poisson parameter. Count distributions give rise to a preponderance of zero-valued observations that account naturally for the fact that more than 50 per cent of source-host country pairs in our sample did not witness a CBA deal during a given year. Furthermore, since a number $n_{sh,t}$ of acquisition events cannot adopt a negative value, Poisson regressions employ an exponential mean transformation to connect the Poisson parameter with the explanatory variables. For the present case with panel data containing $x_{sh,t}$ as explanatory variables and the source country δ_s, host country δ_h, and year δ_t specific constants, this yields

$$E[n_{sh,t}] = \lambda_{sh,t} = \exp(x'_{sh,t}\beta + \delta_s + \delta_h + \delta_t) = \alpha_{s,t} \exp(x'_{sh,t}\beta + \delta_h). \quad (6)$$

Here, $\alpha_{s,t} = \exp(\delta_s + \delta_t)$ absorbs the heterogeneity between pairs of source countries s and years t. As shown by Guimarães *et al.* (2003), specifying $\alpha_{s,t}$ as fixed effect and conditioning

[16] Specifically, the number of observations is given by the product between the total number of deals N and the set of host countries H.

this out of the joint distribution of (6) and (5) over all source countries s, host countries h, and years t yields the (concentrated) log likelihood function

$$\ln L_{pc} = \sum_{s=1}^{S}\sum_{h=1}^{H}\sum_{t=1}^{T} n_{sh,t} x'_{sh,t}\beta - \sum_{s=1}^{S}\sum_{h=1}^{H}\sum_{t=1}^{T}\left[n_{sh,t} \ln\left(\sum_{s=1}^{S}\sum_{h=1}^{H}\sum_{t=1}^{T} \exp(x'_{sh,t}\beta)\right)\right] + C. \quad (7)$$

Since this differs from (4) only as regards the constant C, the estimates of the coefficients β of such a panel Poisson regression are identical to those of the conditional logit model (Guimarães *et al.*, 2003).[17] Note that the desired equivalence between conditional logit model and Poisson regression warrants that the source country δ_s and year specific δ_t constant contained in $\alpha_{s,t}$ are treated as fixed effect in (6) and conditioned out to obtain (7). The key advantage of using a Poisson regression to uncover the impact of variables $x_{sh,t}$ upon the propensity of an MNE to acquire a subsidiary in a given host country h is that the aggregation of CBA deals into a count variable $n_{sh,t}$ entails a dramatic reduction in the number of observations required for estimation.

Owing to different asymptotic assumptions, the overlap between the conditional logit model and the Poisson count regression does not extend to the estimated standard deviations of β. A discussion of this can be found in Schmidheiny and Brülhart (2011, p.219). They show that clustering at the group level produces identical standard errors that can be estimated by block-wise bootstrapping, that is taking draws from blocks defined by α_{st}.

It is well known that the coefficients β of a (nonlinear) Poisson regression are not an estimate for the marginal effect. Rather, uncovering the marginal effect of a given variable $\widetilde{x}^k_{sh,t}$ upon the expected number $E[n_{sh,t}]$ of CBAs warrants the calculation the elasticity $\eta_{sh,t}$. In general, for the Poisson regression, the elasticity equals $\eta_{sh,t} = \beta\widetilde{x}^k_{sh,t}$, which differs across observations of $\widetilde{x}^k_{sh,t}$. To facilitate the interpretation of our coefficients, all variables will be transformed into deviations from their average values, that is $x_{sh,t} = \widetilde{x}_{sh,t}/\overline{x}_{sh,t}$ such that the value of β reports directly the elasticity of the Poisson regression calculated at the average conditions where $x^k_{sh,t} = 1$.

5 Results

Based on the empirical strategy of Section 4, Table 4 reports the results of Poisson regressions upon the number $n_{sh,t}$ of CBAs between pairs of source and host countries during a given year. Column (1) uses the full sample of CBAs whilst, for the 5% value of $\overline{V}$, the remaining columns contain only the number of deals associated with, respectively, the horizontal, vertical, and conglomerate acquisition strategies defined in Section 2. The common sample covers the 1995 to 2010 period (mainly since the variables INVESTMENT FREEDOM, TRADE FREEDOM, and CORRUPTION only date back to 1995) and involves an unbalanced panel with 25,447 observations across the 31 source s and 58 host h countries listed in the data appendix. All specifications include the fixed effects $\alpha_{s,t}$ and a full set of host-country dummy variables δ_h. Note that with these, the interpretation of the coefficients

[17] A derivation of this result is made available on request.

relate to the importance of the variables beyond what is captured by the conditions that are specific to countries or certain years. This mitigates against finding spurious connections related e.g. to the observation of Table 2 that CBAs are concentrated in large and developed countries. Hence, without dummy variables, a close correlation between CBAs and economic size (GDP) might just indicate that large countries have, of course, a large number of potential acquiring and target firms.

Column (1) of Table 4 contains the results using all CBAs as the dependent variable. In total, the common sample includes 126,481 deals. Recall that the interpretation of the coefficients is not straightforward when their theoretical effect changes within a sample where CBAs are driven by various investment strategies. For example, SKP, but not GDP has a significant effect which would be consistent with vertical rather than horizontal motives for multinational integration. Likewise, the significantly positive impact of customs unions (CU) suggest that, across all deals, economic integration leads to more foreign acquisitions, which is again consistent with vertical FDI where the MNE exploits the possibility to ship goods between the different plants of a geographically fragmented supply chain. Aside from TRADE FREEDOM and INVESTMENT COST, the other variables are significant with plausible effects in the sense that an MNE is more likely to acquire a firm in nearby host countries, that share a common language and currency, have low levels of corporate taxation and corruption, and a cheap currency.

The differences in significance of the explanatory variables provide us with a "plausibility check" of our method to disentangle the various acquisition strategies from CBA deals. In particular, the theoretical literature ties horizontal strategies with the MNEs' desire to access markets whilst vertical strategies are thought to encapsulate the desire to outsource production stages to low wage countries. This divergent effect lies clearly in evidence when comparing the results of columns (2) and (3) of Table 4. In particular, column (2) with horizontal CBAs gives rise to a highly significant entry of GDP, but an insignificant entry of SWP, whilst, as expected, the converse situation arises in column (3) with vertical deals. The coefficients of Table 4 provide direct evidence that the differences between horizontal and vertical CBAs stipulated by established theories of the MNE manifest themselves in the data. In general, at any conventional level of rejection, a likelihood ratio test between the values of $\ln L$ for the Poisson regression with all, horizontal, and vertical CBAs as dependent variable suggests that these econometric specifications differ in statistically significant manner.

The differential impact of market size and the factor endowment difference variable on horizontal and vertical CBAs turns out to be robust to several modifications of the results of columns (2) and (3) of Table 4. Specifically, though the descriptive overview of Section 3 gave rise to a substantial shift in the proportion of horizontal and vertical deals when lowering the cut-off value $\overline{V}$ to 1%, this yields again coefficients that are consistent with the theoretical priors. Conversely, with the 10% cut-off for $\overline{V}$, SWP also significantly affects deals classified to be horizontal. This could suggest that the 10% cut-off to define vertical relatedness is too strict implying that some deals are classified as horizontal even though the acquiring and target firm are connected through the supply chain. The essence of our results is unaffected by considering different samples containing only deals with US firms

Table 4: Determinants of CBAs

	All CBAs	Horizontal CBAs	Vertical CBAs	Conglomerate CBA
	(1)	(2)	(3)	(4)
GDP	0.011	0.075***	0.009	-0.029
	(0.018)	(0.024)	(0.023)	(0.021)
SWP	0.781***	0.283	1.030***	0.820***
	(0.156)	(0.193)	(0.209)	(0.185)
Distance	-1.101***	-1.253***	-1.035***	-1.114***
	(0.033)	(0.036)	(0.035)	(0.041)
Language	0.092***	0.104***	0.086***	0.094***
	(0.003)	(0.004)	(0.004)	(0.003)
CU	0.056***	0.008	0.052***	0.088***
	(0.009)	(0.012)	(0.009)	(0.011)
Trade Freedom	0.034	0.014	0.068	0.007
	(0.043)	(0.053)	(0.074)	(0.053)
Investment Fd.	0.008	-0.069	0.011	-0.040
	(0.080)	(0.087)	(0.107)	(0.108)
Corruption	-0.156**	-0.105	-0.099	-0.172**
	(0.063)	(0.070)	(0.076)	(0.086)
Corporate Taxes	-0.329***	-0.209**	-0.315***	-0.412***
	(0.085)	(0.097)	(0.096)	(0.104)
Exchange Rate	-0.438***	-0.511***	-0.455***	-0.427***
	(0.067)	(0.075)	(0.077)	(0.076)
Euro	0.006**	0.009***	0.010***	-0.001
	(0.002)	(0.003)	(0.003)	(0.003)
$\alpha_{s,t}$	yes	yes	yes	yes
δ_h	yes	yes	yes	yes
#cba	126,481	24,133	36,334	45,251
#obs	25,446	25,446	25,446	25,446
$\ln L$	-49,116	-19,107	-22,967	-26,402

Notes: The dependent variable is the number (count) of CBAs $n_{sh,t}$. Estimation of the panel Poisson regression with fixed effect $\alpha_{s,t}$ is by maximum likelihood. All explanatory variables have been transformed into deviations from their mean. Hence, the coefficient estimates represent an elasticity, that is the percentage change of $n_{sh,t}$ when an explanatory variable, at its average value, changes by one per cent. The 5% cut-off level is used for $\overline{V}$ to define FDI strategies reported columns (2) to (4). The data cover a common sample of CBAs for the 1995 to 2010 period and include observations from 31 source and 58 host countries. Furthermore, #cba is the number of deals, #obs is the number of observations, and $\ln L$ the value of the log likelihood function. Block bootstrapped robust standard errors are reported in parantheses; 100 replications (blocks defined by α_{st}). * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

as acquirer or target, to reflect that the technology inherent in the input-output tables to define vertical relatedness in Section 2 refers to the US. As mentioned in Section 2, deals between firms operating only in one industry, where ambiguities of finding multiple horizontal or vertical overlaps cannot arise, account only for a small fraction of the sample. In particular, in the 4,349 horizontal deals involving single industry firms, the market size effect is again significantly positive whilst the effect of the skilled wage premium (SWP) is insignificant. Conversely, both effects are insignificant for the case of vertical deals between single industry firms. The reason might be that this group only contains 1,462 deals or less than 5 per cent of all vertical deals included in column (3) of Table 4. Further to the discussion of Section 2, we have also distinguished between cases where vertical integration arises with the upstream and downstream stages of the supply chain. Again, a significantly negative effect on the SKP but not on the market size variable arises regardless whether a forward or backward vertical integration is considered. Finally, the key distinction between horizontal and vertical CBAs holds also when we consider the somewhat broader defined WAGE INDEX to reflect international differences in labor cost. For the sake of brevity, the results of these sensitivity checks are not reported here, but are available on request.

While not central to our focus here and to save space, we note that many of the control variables vary across different categories. For example, conglomerate acquisitions are relatively sensitive to corporate taxes; customs unions appear to have a differential effect depending on the acquisition strategy. These issues are worthy of further, more detailed research on what may be driving these differential effects.

Table 5 adds explanatory variables measuring the differences in market-to-book (MtB) ratios between source and host country to reflect the possibility of financial arbitrage considered by Erel *et al.* (2011), and the differences in SHAREHOLDER RIGHTS to reflect the governance motive of CBAs considered by Rossi and Volpin (2004). Recall that the market-to-book ratio was split into a component reflecting misvaluation (MtB^m) and a component reflecting a relative wealth effect (MtB^w). The corresponding data is only available for 18 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Italy, Japan, Netherlands, Norway, Singapore, Spain, Sweden, United Kingdom, United States). Hence, the sample with which we can test the financial arbitrage and governance motive contains only about one fifth of the observations used to calculate the results of Table 4 above. Nevertheless, aside from the lower significance of some coefficients that can be attributed to the reduced heterogeneity within a sample containing only developed countries, the impact of the common variables between the Table 4 and Table 5 is by and large similar. One notable difference is that a slightly significant effect arises with the SWP with horizontal CBAs in column 2 of Table 4. However, when considering the 1% benchmark for $\overline{V}$, which is a stricter criterion to identify horizontal deals, the significant effect of GDP and insignificant effect of SKP arises concurring with the theoretical prior.

The results of column (1) of Table 5 suggest that mis-valuation (MtB^w) impacts significantly upon the number of CBAs. Within the spirit of finance driven acquisitions proposed by Shleifer and Vishny (1993), aside from the conventional economic and geographical variables introduced above, CBAs can apparently also reflect the desire to exploit the relative

Table 5: Adding Financial Arbitrage and Governance Motives

	All CBA	Horizontal CBA	Vertical CBA	Conglomerate CBA
	(1)	(2)	(3)	(4)
GDP	-0.005	0.130**	0.031	-0.138**
	(0.045)	(0.061)	(0.055)	(0.051)
SWP	0.201***	0.176*	0.284***	0.165*
	(0.060)	(0.090)	(0.080)	(0.085)
Distance	-0.883***	-0.964***	-0.858***	-0.904***
	(0.037)	(0.048)	(0.036)	(0.041)
Language	0.160***	0.179***	0.157***	0.157***
	(0.005)	(0.007)	(0.006)	(0.006)
CU	0.127***	0.069*	0.086***	0.190***
	(0.028)	(0.027)	(0.030)	(0.030)
Trade Freedom	-0.496	0.543	-0.571	-0.955*
	(0.550)	(0.714)	(0.649)	(0.525)
Investment Fd.	0.040	-0.232	0.113	0.078
	(0.148)	(0.185)	(0.154)	(0.174)
Corruption	0.057	0.096	0.132	-0.012
	(0.102)	(0.137)	(0.109)	(0.104)
Corporate Taxes	-0.273*	-0.145	-0.131	-0.381**
	(0.141)	(0.155)	(0.135)	(0.156)
Exchange Rate	-0.626***	-0.725***	-0.841***	-0.512**
	(0.178)	(0.184)	(0.213)	(0.217)
Euro	0.026***	0.039***	0.036***	0.011
	(0.007)	(0.008)	(0.009)	(0.009)
MtB^m	0.929*	0.769	0.533	1.318**
	(0.496)	(0.537)	(0.457)	(0.647)
MtB^w	0.0001	0.0005	-0.0001	0.00002
	(0.0004)	(0.0004)	(0.0004)	(0.000)
Shareh. Rights	0.138***	0.115**	0.176***	0.135**
	(0.045)	(0.053)	(0.056)	(0.056)
$\alpha_{s,t}$	yes	yes	yes	yes
δ_h	yes	yes	yes	yes
#cba	81,121	15,329	23,859	29,092
$\#\text{obs}_{pc}$	4,896	4,896	4,896	4,896
$\ln L_{pc}$	-16,851	-7,018	-8,697	-9,811

Notes: The dependent variable is the number (count) of CBAs $n_{sh,t}$. Estimation of the panel Poisson regression with fixed effect α_{st} is by maximum likelihood. All explanatory variables have been transformed into deviations from their mean. Hence, the coefficient estimates represent an elasticity, that is the percentage change of $n_{sh,t}$ when an explanatory variable, at its average value, changes by one per cent. The 5% cut-off level is used for $\overline{V}$ to define FDI strategies reported columns (2) to (4). The data cover a common sample of CBAs for the 1995 to 2010 period and include observations from 18 (source and host) countries. Furthermore, #cba is the number of deals, #obs is the number of observations, and $\ln L$ the value of the log likelihood function. Block bootstrapped robust standard errors are reported in parantheses; 100 replications (blocks defined by $\alpha_{s,t}$). * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

undervaluation of target firms abroad. Contemplating the differences between columns (2) to (4), it is perhaps not surprising that a statistically significant effect of MtB^m arises only with conglomerate deals, where the coefficient, with an elasticity above one, is also economically large. Furthermore, recall from Figure 4 that large parts of diversifying CBAs involve financial sector acquirers which, apparently, target undervalued firms to make arbitrage profits by exploiting international valuation differences. The effect of MtB^m is also consistent with the discussion around Figure 5, according to which merger waves manifest themselves primarily in the changes of conglomerate CBA activity. Through the mis-pricing effect, the burgeoning financial market at the end of the 1990s and before the global financial may have transmitted into the international market for corporate control. Conversely, the relative wealth effects inherent in MtB^w are neither significant nor are they economically important. Maybe, relative wealth effects are more important for specific firms or industries, but average out across aggregated counts of CBAs used here as the dependent variable. Finally, the corporate governance motive suggested by Rossi and Volpin (2004) matters regardless the pursued acquisition strategy in the sense that CBAs are likely to involve source countries offering relatively higher investor protection than the host country.

6 Summary and Conclusion

Given the crucial role that multinational enterprizes (MNEs) play within the global economy, it is important to understand the strategies that underpin the desire of firms to establish plants in several countries. As such, there has been a debate in the international economics literature about the relative importance of horizontal, that is market-access driven, and vertical, that is factor endowment driven, strategies. Hitherto, the prevailing view is that horizontal strategies should mainly target countries with large domestic markets, whilst vertical strategies should dominate between countries that differ in terms of factor endowments and cost.

To inform this debate, this paper has used a large panel with cross-border acquisitions (CBAs) covering 31 source and 58 host countries across 21 years. For our dataset, using detailed information on all the industrial affiliations of the acquiring and target firm, we can directly identify horizontal and vertical linkages for each cross-border acquisition deal. Consistent with the priors of the traditional literature on the MNE, we then find that the number of horizontal CBAs, where target and acquiring firm operate within identical industries that are unrelated through the supply chain, tends to increase with the market size of the involved countries. Conversely, international differences in labor cost affect vertical CBAs, where the acquiring and target firms operate in different industries that are connected through the supply chain.

Strategies that neither involve a horizontal nor a vertical motive have by and large been ignored in the international economics literature. However, CBAs can in principle also occur between firms that neither share industries nor are connected through a supply chain. Empirically, such conglomerate strategies are far from uncommon and, even with generous definitions for horizontal and vertical relatedness, account for more than one fifth of the

CBA deals in our sample covering the 1990 to 2011 period. Rather than industrial synergies, we find that such conglomerate CBAs are distinctively driven by financial arbitrage opportunities when MNEs invest in countries where firms are undervalued.

To conclude, moving beyond the established distinction in international economics between horizontal and vertical strategies could, in our view, open some avenues to reappraise the role of the MNEs in international investment. In particular, horizontal and vertical strategies seem to be ill-equipped to explain the marked surges in international merger activity since factors such as market size wages change only gradually. Conversely, the financial variables that can maybe be tied with conglomerate strategies exhibit the wave-like behavior to sustain the surges in the international market for corporate control. Financial arbitrage might be an important factor to better explain the time profile of FDI. To the extent that the 'pecking order' of international financial flows rests, among other things, on the alleged more stable behavior of FDI over portfolio flows (Razin, 2007), acknowledging that conglomerate strategies might drive a substantial part of CBAs provides maybe a more nuanced view of the relative advantages of FDI over portfolio capital investment.

References

Acemoglu, D., S. Johnson and T. Mitton (2009), Determinants of vertical integration: financial development and contracting costs, Journal of Finance 63, 1251- 1290.

Alfaro, L., and M. Chen (2012). Surviving the Global Financial Crisis: Foreign Ownership and Establishment Performance, American Economic Journal: Economic Policy 4, 3055.

Alfaro, L. and A. Charlton (2009), Intra-industry foreign direct investment, American Economic Review 99, 2096-2119.

Amihud, Y and B. Lev, (1981). Risk reduction as a managerial motive for conglomerate mergers, Bell Journal of economics 12, 605-617.

Baker, M., Foley, C.F., and Wurgler, J. (2008), Multinationals as Arbitrageurs: The Effect of Stock Market Valuations on Foreign Direct Investment, Review of Financial Studies 22, 337-369.

Blonigen, B.A., Davies, R.B. and Head, K. (2003), Estimating the Knowledge-Capital Model of the Multinational Enterprise: Comment, The American Economic Review 93, 980-994.

Braconier, H., P.H. Norbäck, and D. Urban (2005), Multinational enterprises and wage cost: vertical FDI revisited, Journal of International Economics 67, 446-470.

Brainard, L. (1997), An Empirical Assessment of the Proximity-Concentration Trade-off Between Multinational Sales and Trade, American Economic Review 87, 520-544.

Carr, D.L., J.R.Markusen and K.E. Maskus (2001), Estimating the knowledge capital model of the multinational enterprise, American Economic Review 91, 693-708.

Coeurdacier, N., R.A. De Santis, and A. Aviat (2009), Cross-border mergers and acquisitions and European integration, Economic Policy 57, 56-106.

Daude, C. and E. Stein (2007), The quality of institutions and foreign direct investment, Economics and Politics 19, 317-344.

Di Giovanni, J. (2005), What drives capital flows? The case of cross-border M&A activity and financial deepening, Journal of International Economics 65, 127-149.

Erel, I., R.C. Liao and M.C. Weisbach (2011), Determinants of Cross-Border Mergers and Acquisitions, The Journal of Finance 68, 1045-1082.

Fan, J.P.H. and L.H.P.Lang (2000), The measurement of relatedness: an application to corporate diversification, Journal of Business 73, 629-660.

Fan, J.P.H. and V.K.Goyal (2006), On the patterns and wealth effects of vertical mergers' Journal of Business 97, 877-902.

Froot, K. A. and J.C. Stein (1991), Exchange rates and foreign direct investment: an imperfect capital markets approach, Quarterly Journal of Economics 106, 1191-1217.

Garfinkel, J.A., and K.W. Hankins (2011), The role of management in mergers and merger waves, Journal of Financial Economics 101, 515-532.

Guimaraes, P., O. Figueirdo and D. Woodward (2003), A Tractable Approach to the Firm Location Decision Problem, The Review of Economics and Statistics 85, 201-204.

Helpman, E. (1984), A Simple Theory of Trade with Multinational Corporations, Journal of Political Economy 92, 451-471.

Herger, N., C. Kotsogiannis and S. McCorriston (2008), Cross-Border Acquisitions in the Global Food Sector, European Review of Agricultural Economics 35, 563-587.

Hijzen, A., H. Görg and M. Manchin (2008), Cross-border mergers & acquisitions and the role of trade costs, European Economic Review 52, 849-866.

Head, K., and J. Ries (2008), FDI as an outcome of the market for corporate control: Theory and Evidence, Journal of International Economics 74, 2-20.

Kessing, S., K.A. Konrad and C. Kotsogiannis (2007), Foreign direct investment and the dark side of decentralisation, Economic Policy 49, 5-70.

Markusen, J.R. and T. Venebles (1998), Multinational Firms and the New Trade Theory, Journal of International Economics 46, 183-203.

Markusen, J.R. and K.E. Maskus (2002), Discriminating among alternative theories of the multinational enterprise, Review of International Economics 10, 694-707

Markusen, J.R. (2002), Multinational Firms and the Theory of International Trade, Cambridge (Mass.), MIT Press.

Matsusaka, J.G. (1996), Did though antitrust enforcement cause the diversification of American corporations?, Journal of Financial and Quantitative Analysis 31, 283-294.

McGuckin, R.H., S.V. Nguyen, and S.H. Andrews (1991), The relationships among acquiring and acquired firms' product lines, Journal of Law and Economics 34, 477-502.

Mueller, D. (1969), A Theory of Conglomerate Mergers, The Quarterly Journal of Economics 83, 643-659.

Rossi, S., and P.F Volpin (2004), Cross-country determinants of mergers and acquisitions, Journal of Financial Economics 74, 277-304.

Schmidheiny, K., and M. Brülhart (2011), On the equivalence of location choice models: Conditional logit, nested logit and Poisson, Journal of Urban Economics 69, 214-222.

UBS (various years), Prices and Earnings - A comparison of purchasing power around the globe, Zurich.

Wei, S-J. (2000), How taxing is corruption on international investors?, Review of Economics and Statistics 82, 1-11.

Williamson, O. (1981), The Modern Corporation: Origins, Evolution, Attributes, Journal of Economic Literature 19, 1537-1568.

Williamson, O. (1970), Corporate Control and Business Behavior: An Inquiry into the Effects of Organizational Form on Enterprise Behavior, Prentice Hall, Englewood Cliffs (New Jersey).

Yeaple, S. R. (2003), The complex integration strategies of multinationals and cross country dependencies in the structure of foreign direct investment, Journal of International Economics, 60, 293-314.

Country Coverage

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

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

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

As host: Argentina (Buenos Aires), Australia (Sydney), Austria (Vienna), Bahrain (Manama), Belgium (Brussels), Brazil (Sao Paulo), Bulgaria (Sofia), Canada (Toronto), Chile (Santiago de Chile), China (Shanghai), Colombia (Bogota), Czech Republic (Prague), Cyprus (Nikosia), Denmark (Copenhagen), Estonia (Tallinn), Finland (Helsinki), France (Paris), Germany (Frankfurt), Greece (Athens), Hongkong(Hongkong), Hungary (Budapest), India (Mumbai), Indonesia (Djakarta), Ireland (Dublin), Israel (Tel Aviv), Italy (Milan), Japan (Tokyo), Kenya (Nairobi), Korea (Seoul), Latvia (Riga), Lithuania (Vilnius), Luxembourg (Luxembour), Malaysia (Kuala Lumpur), Mexico (Mexico City), Netherlands (Amsterdam), New Zealand (Auckland), Norway (Oslo), Panama (Panama), Peru (Lima), Philippines (Manila), Poland (Warsaw), Portugal (Lisbon), Romania (Bucharest), Russia (Moscow), Singapore (Singapore), Slovak Republic (Bratislava), Slovenia (Ljubliana), South Africa (Johannesburg), Spain (Madrid), Sweden (Stockholm), Switzerland (Zurich), Thailand (Bangkok), Turkey (Istanbul), Ukraine (Kiev), United Arab Emirates (Dubai), United Kingdom (London), United States (Washington), Venezuela (Caracas).

Table 6: Description of the Data Set

Variable	*Description*	*Source*
Dependent Variables:		
CBA	Number of international merger deals between the source country s and host countries h during year t. The horizontal, vertical, and conglomerate modes defined in this are described in the text.	Compiled from SDC Platinum of Thomson Financial.
Covariates:		
CORRUPTION	Corruption index on a scale from 10 to 90. Original values have been reversed such that higher values mean more corruption. For the year 1995 the values for Belgium, Finland, Netherlands and Norway are not available and the values of 1996 have been used.	Heritage Foundation.
CU	Nominal variable for source and host countries that are member of a customs union.	World Trade Organization: Regional Trade Agreements (RTA) Database.
DISTANCE	Great circular distance between Washington DC and the capital city of the host country in terms of logarithmically transformed thousand Km.	Compiled from www.chemical-ecology.net/java/capitals.htm.
EURO	Nominal variable for source and host countries sharing the Euro as common currency.	
EXCHANGE RATE	Real exchange rate (an increase is an appreciation of the source country currency). Calculated from by dividing the nominal exchange rate with with the PPP factor over GDP.	Penn World Tables.
GDP	Market size of the source and host country as measured by the real Gross Domestic Product denominated in US$ with base year 2000.	World Development Indicators (WDI) of the World Bank.
INVESTMENT FREEDOM	Index of freedom of investment referring to whether there is a foreign investment code that defines the country's investment laws and procedures; whether the government encourages foreign investment through fair and equitable treatment of investors; whether there are restrictions on access to foreign exchange; whether foreign firms are treated the same as domestic firms under the law whether the government imposes restrictions on payments, transfers, and capital transactions; and whether specific industries are closed to foreign investment. For the year 1995 the values for Belgium, Finland, Netherlands and Norway are not available and the values of 1996 have been used. Higher values mean more freedom.	Heritage Foundation.

Further Covariates:		
LANGUAGE_{sh}	Countries sharing a common official language.	Compiled from CIA World Factbook.
MtB^{m}	Difference in the mis-valuation component of market to book ration between source and host country. Mis-valuation is calculated by regressing the future stock market return on current values of the MtB and calculating the fitted values. See Baker *et al.* (2008) for the details of this method	Compiled from Datastream.
MtB^{w}	Difference in the wealth component of market to book ration between source and host country. The wealth component is calculated by regressing the future stock market return on current values of the MtB and calculating the residual. See Baker *et al.* (2008) for the details of this method	Compiled from Datastream.
SHAREHOLDER RIGHTS	Difference in shareholder rights between the source and host country. Shareholder rights are measured by an anti-directors rights index reflecting (i) the possibility of shareholders to mail their proxy vote, (ii) whether shareholders are required to deposit their shares prior to the General Shareholders Meeting (iii) whether cumulative voting is allowed (iv) an oppressed minorities mechanism exists (5) whether the minimum stake allowing shareholders to call for an extraordinary shareholders meeting is more or less than 10%. Higher values mean more power for shareholders.	La Porta *et al.* (1998)
SWP	Skilled wage premium in host host country. Wages of skilled and unskilled labor refer to the hourly salaries of, respectively, department heads and factory workers as paid in the capital city or the financial center of a country. Data are published on a tri-annual basis (1994, 1997, 2000, 2003, 2006, 2009). Values of missing years have been filled with the closest observation.	Braconier *et al.* (2005), UBS Prices and Earnings (various years).
TRADE FREEDOM	Index of freedom of international trade (tariff and non-tariff barriers) on a scale from 10 to 90. For the year 1995 the values for Belgium, Finland, Netherlands and Norway are not available and the values of 1996 have been used. Higher values mean more freedom.	Heritage Foundation.
WAGE INDEX	Wage in the host country net of compulsory social security contributions. Wages are measured by an index referring to the hourly income of 13 comparable professions (product managers, department heads, engineers, primary school teachers, bus drivers, car mechanics, building laborers, industrial workers, cooks, bank credit officers, personal assistants, sales assistants, factory workers) as paid in the capital city or the financial center of a country. Data are published on a tri-annual basis. Values of the missing years have been filled with the closest observation available.	UBS, Prices and Earnings.

A Reviewers Appendix

A.1 Derivations: Log-Likelihood of Fixed Effects Poisson Count Regression

To derive the fixed effects estimator for Poisson regressions, Guimaraes *et al.* (2003) use a maximum likelihood approach estimating the coefficients (β) simultaneously with the fixed effects α_{st}. Using (5) to calculate the likelihood function yields

$$\ln L(\alpha_{st}, \beta) = \sum_{s=1}^{S} \sum_{h=1}^{H} \sum_{t=1}^{T} \ln \left[\frac{\exp(-\lambda_{sh,t}) \lambda_{sh,t}^{n_{sh,t}}}{n_{sh,t}!} \right]. \tag{8}$$

Inserting (6) gives

$$\ln L(\alpha_{st}, \beta) = \sum_{s=1}^{S} \sum_{t=1}^{T} \left[-\alpha_{st} \sum_{h=1}^{H} \exp(x'_{sh,t}\beta) + \ln \alpha_{st} \sum_{h=1}^{H} n_{sh,t} + \sum_{h=1}^{H} n_{sh,t}(x'_{sh,t}\beta) - \sum_{h=1}^{H} n_{sh,t}! \right]. \tag{9}$$

Differentiating this with respect to α_{st} and setting to 0 yields

$$\widehat{\alpha}_{st} = \frac{\sum_h n_{sh,t}}{\sum_h \exp\left(x'_{sh,t}\beta\right)}. \tag{10}$$

Substituting this back into (9) yields the concentrated likelihood function of (7), that is

$$\ln L(\beta, \tau) = \sum_{s=1}^{S} \sum_{h=1}^{H} \sum_{t=1}^{T} n_{sh,t} x'_{sh,t}\beta - \sum_{s=1}^{S} \sum_{h=1}^{H} \sum_{t=1}^{T} \left[n_{sh,t} \ln \left(\sum_{s=1}^{S} \sum_{h=1}^{H} \sum_{t=1}^{T} \exp(x'_{sh,t}\beta) \right) \right] + C,$$

where $C = \sum_{s=1}^{S} \sum_{h=1}^{H} \sum_{t=1}^{T} n_{sh,t} + \sum_{s=1}^{S} \sum_{h=1}^{H} \sum_{t=1}^{T} n_{sh,t}!$.

A.2 Robustness Checks

Table 7: Robustness Checks I: Different Cutoff Levels for Vertical Relatedness

	1 % for $\overline{V}$		10 % for $\overline{V}$	
	Horizontal CBAs	Vertical CBAs	Horizontal CBAs	Vertical CBAs
	(1)	(2)	(3)	(4)
GDP	0.117***	0.005	0.058***	-0.001
	(0.038)	(0.020)	(0.019)	(0.031)
SWP	0.290	0.915**	0.629***	1.054***
	(0.320)	(0.207)	(0.189)	(0.298)
Distance	-1.347***	-1.073***	-1.203***	-0.949***
	(0.054)	(0.037)	(0.038)	(0.045)
Language	0.104***	0.090***	0.102***	0.066***
	(0.005)	(0.003)	(0.003)	(0.005)
CU	0.015	0.059***	0.015	0.053***
	(0.013)	(0.009)	(0.010)	(0.011)
Trade Freedom	-0.004	0.031	0.051	0.055
	(0.072)	(0.046)	(0.040)	(0.117)
Investment Fd.	-0.102	0.051	-0.0002	0.088
	(0.134)	(0.088)	(0.091)	(0.170)
Corruption	-0.093	-0.132**	-0.153**	-0.105
	(0.088)	(0.068)	(0.065)	(0.097)
Corporate Tax.	-0.511***	-0.354***	-0.347***	-0.130
	(0.122)	(0.087)	(0.088)	(0.134)
Exchange Rate	-0.501***	-0.453***	-0.543***	-0.388***
	(0.103)	(0.068)	(0.066)	(0.084)
Euro	0.013***	0.005*	0.007**	0.014***
	(0.004)	(0.003)	(0.00*)	(0.004)
α_{st}	yes	yes	yes	yes
δ_h	yes	yes	yes	yes
#cba	9,778	71,219	44,911	14,178
#obs	25,446	25,446	25,446	25,446
$\ln L$	-10,745	-34,706	-26,412	-14,455

Notes: The dependent variable is the number (count) of CBAs $n_{sh,t}$. Estimation of the panel Poisson regression with fixed effect α_{st} is by maximum likelihood. All explanatory variables have been transformed into deviations from their mean. Hence, the coefficient estimates represent an elasticity, that is the percentage change of $n_{sh,t}$ when an explanatory variable, at its average value, changes by one per cent. The data cover a common sample of CBAs for the 1995 to 2010 period and include observations from 31 source and 58 host countries. Furthermore, #cba is the number of deals, #obs is the number of observations, and $\ln L$ the value of the log likelihood function. Bootstrapped standard errors (clustered by α_{st}) are reported in parantheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 8: Robustness Checks II: Different Samples and Variables

	Single Industry Firms		US Firms		Backward Ver	Forward Ver	Wage Index	
	Horizontal CBAs	Vertical CBAs	Horizontal CBAs	Vertical CBAs	Vertical CBAs	Vertical CBAs	Horizontal CBAs	Vertical CBAs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP	0.093***	0.010	0.424***	0.193	0.034	-0.001	0.075***	0.015
	(0.033)	(0.042)	(0.116)	(0.130)	(0.024)	(0.029)	(0.023)	(0.021)
SWP (Wage)	0.055	-0.056	-0.247	1.593***	1.189***	1.205***	0.061*	-0.134***
	(0.346)	(0.688)	(0.439)	(0.353)	(0.352)	(0.338)	(0.035)	(0.036)
Distance	-1.307***	-1.226***	-1.944***	-2.362***	-1.048***	-1.050***	-1.249***	-1.027***
	(0.064)	(0.078)	(0.336)	(0.359)	(0.041)	(0.055)	(0.047)	(0.034)
Language	0.114***	0.099***	0.167***	0.174***	0.037***	0.082***	0.009	0.085***
	(0.006)	(0.008)	(0.036)	(0.034)	(0.006)	(0.006)	(0.012)	(0.003)
CU	-0.023	0.030			0.079***	0.041**	0.006	0.055***
	(0.018)	(0.024)			(0.016)	(0.016)	(0.047)	(0.010)
Trade Freedom	0.106	0.073	-0.051	0.046	0.024	0.127	0.006	0.025
	(0.075)	(0.134)	(0.086)	(0.058)	(0.085)	(0.083)	(0.047)	(0.071)
Investment Fd.	-0.225	-0.193	-0.010	0.211*	0.096	0.113	-0.080	-0.071
	(0.167)	(0.206)	(0.153)	(0.120)	(0.178)	(0.157)	(0.112)	(0.106)
Corruption	-0.137	-0.319**	-0.081	-0.105	0.100	-0.171	-0.111	-0.330***
	(0.131)	(0.144)	(0.141)	(0.123)	(0.119)	(0.137)	(0.065)	(0.087)
Corporate Tax.	-0.558***	-0.647***	0.343*	-0.015	-0.318**	-0.065	-0.214**	-0.502***
	(0.123)	(0.220)	(0.200)	(0.225)	(0.132)	(0.136)	(0.094)	(0.068)
Exchange Rate	-0.666***	-0.793***	-0.510***	-0.157*	-0.282**	-0.723***	-0.509***	-0.871***
	(0.128)	(0.218)	(0.141)	(0.094)	(0.139)	(0.132)	(0.080)	(0.183)
Euro	0.009*	0.010			0.002	0.0001	0.009***	0.009***
	(0.005)	(0.009)			(0.005)	(0.006)	(0.003)	(0.003)
α_{st}	yes	yes	yes	yes	yes	yes	yes	yes
δ_h	yes	yes	yes	yes	yes	yes	yes	yes
#cba	4,349	1,462	8,885	15,789	5,099	4,596	24,133	36,334
#obs	25,446	25,446	1,302	1,302	25,446	25,446	25,446	25,446
$\ln L$	-7,551	-3,493	-1,477	-1,840	-6,833	-6,470	-19,089	-22,977

Notes: The dependent variable is the number (count) of CBAs $n_{sh,t}$. Estimation of the panel Poisson regression with fixed effect α_{st} is by maximum likelihood. All explanatory variables have been transformed into deviations from their mean. Hence, the coefficient estimates represent an elasticity, that is the percentage change of $n_{sh,t}$ when an explanatory variable, at its average value, changes by one per cent. The 5% cut-off level is used for $\overline{V}$ to define FDI strategies reported columns (2) to (4). The data cover a common sample of CBAs for the 1995 to 2010. Furthermore, #cba is the number of deals, #obs is the number of observations, and $\ln L$ the value of the log likelihood function. Bootstrapped standard errors (clustered by α_{st}) are reported in parantheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.