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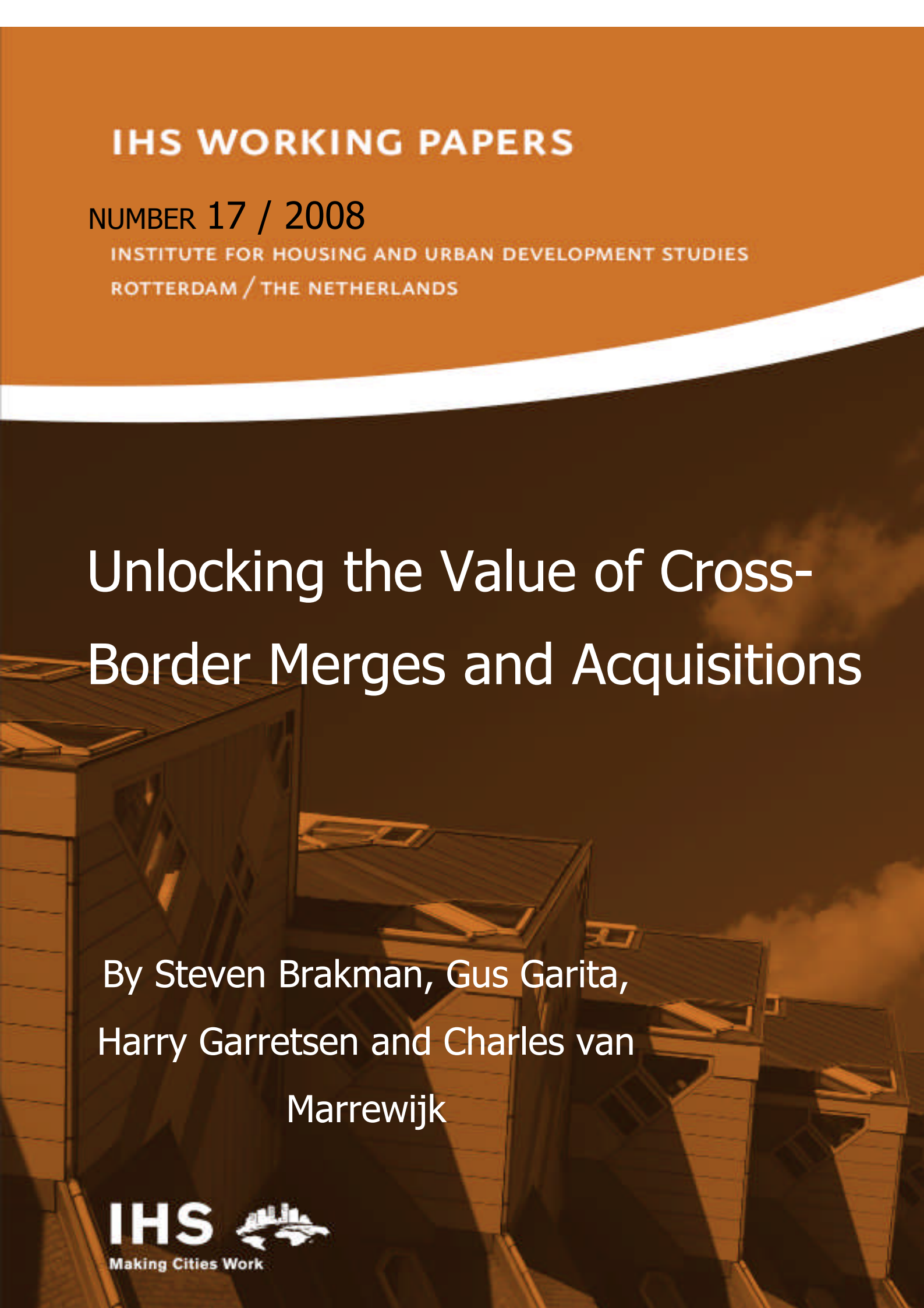

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Making Cities Work

Unlocking the Value of Cross-Border Mergers and Acquisitions[1]

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Abstract: Most FDI takes place between the developed countries, which suggests that the market-seeking motive is important for understanding FDI. However, given the stylized fact that trade barriers (e.g. transportation costs and financial barriers) have declined over the past 20 years, models that aim to explain market-seeking FDI tend to predict a decline in FDI. Neary (2008) offers two explanations for this puzzle: (1) the export platform motive (where firms gain access to an integrated market by investing in one of the "integrated" countries); (2) Neary's (2007) GOLE model, which explains cross-border mergers and acquisitions (this model is of interest since most FDI comes in the form of M&As). By using a gravity framework, where we also deal with the "zero gravity problem", we confirm the predictions of the GOLE model.

Key words: Cross-Border M&As, Financial Openness, Economic Integration
JEL code: F10, F12, F15, F36, F37, F41, G34, L13

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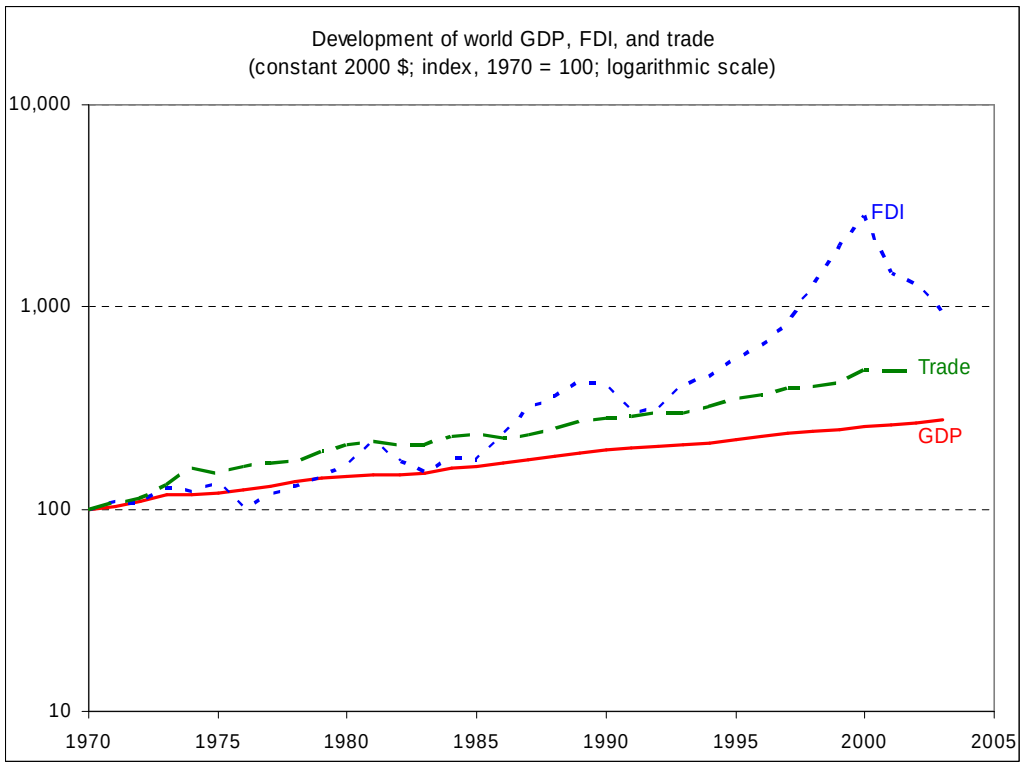
1. Introduction

Two waves stand out in the history of globalization. The first wave took place in-between 1850-1913, and the second wave started after WWII and continues until this day (see Bordo et al. 2003); moreover, Baldwin (2006) characterizes globalization in terms of two great unbundlings. In his view, during the first wave and much of the second wave, the fall in transportation costs and the removal of trade barriers spatially unbundled production from consumption, which enabled international specialization.[2] With the second unbundling, the start of which Baldwin (2006) dates at around 1980-1990, production itself is increasingly geographically separated; that is, it is no longer the case that production takes place under a single roof. In this light, new technologies enable firms to relocate certain stages of the production process to other countries.

Figure 1 Development of GDP, FDI, and trade



Source: van Marrewijk (2007, p. 325)

As Figure 1 shows, throughout the past 15 years the growth rate of FDI has surpassed the growth rates of both world GDP and world trade. This increased importance of FDI has led to an enthralling and relatively new research agenda that tries to explain the existence of multinational enterprises or MNEs (see for example Markusen, 2002; Barba-Navaretti and Venables, 2004; Helpman, 2006; and Brakman and Garretsen, 2008). A key feature of these

[2] This is the standard or textbook view of globalization.

models is the role of trade barriers or, in general, economic distance in determining FDI, since distance related variables are crucial for understanding FDI patterns. For example, if FDI is mainly market seeking, then larger trade costs will stimulate FDI. If, on the other hand, FDI is factor-cost seeking, then higher trade barriers will reduce FDI, since it would be more expensive to re-import intermediate products. Given that most FDI continues to take place between developed economies, the dominant motive for FDI seems to be the market-seeking motive.[3] This last observation presents us with a puzzle, since the fall in trade barriers during the last two decades (e.g. EU integration) should have led to a *reduction* of market-seeking FDI (see Neary, 2007 and 2008). As we have argued and as Figure 1 illustrates, the opposite seems true (i.e. FDI has become more important).

Neary (2008) identifies and analyzes possible explanations for this puzzle. His first argument is that FDI might not only be market seeking (in a bilateral sense), but can be of the "export-platform" type; that is, firms are looking for a central location from which to serve a set of closely related and integrated countries. The inclusion of these so-called "third country" effects may explain why increased EU integration stimulates FDI in the EU, especially from the USA (thereby bypassing EU-US trade costs that would be incurred if the goods were to be exported from the USA to the EU). There is evidence that these "third country" effects or spatial linkages are important (Garretsen and Peeters, 2008), but also evidence that they are not (Blonigen et al., 2007). The second explanation, and one that constitutes the starting point for the present paper, follows from an application of Neary's GOLE (General Oligopolistic Equilibrium) model (see Neary, 2007 and 2008). This model deals with the aforementioned puzzle, given that it addresses the stylized fact that most FDI flows are in the form of cross-border Mergers & Acquisitions (hereafter, M&As). Therefore, in this paper and using a "new" gravity model approach, we will test the relevance of distance and other determinants (notably financial integration) for the value of cross-border M&As.[4] Based on the Thomson data set for M&As, we use an extensive data set with firm-specific M&A data for 211 countries during the period 1986-2005.

The goal of the research herein is twofold; first, we want to establish whether our gravity approach can help unlock the value of cross-border M&As. To date, and despite its quantitative importance (see section 2), gravity studies have mainly focused on trade or on

[3] The share of FDI to developing countries is increasing, see Barba Navaretti and Venables (2004).
[4] A companion paper (Garita and van Marrewijk, 2008) analyzes the number of deals.

FDI in general, and have largely ignored cross-border M&As (for exceptions, see Evenett, 2004, and Di Giovanni, 2005). Second, and related to the abovementioned observations, by focusing on the distance variable and on financial openness, we seek to find out if our gravity model can help us improve our understanding of the relationship between economic and financial integration on the one hand and the value of cross-border M&As on the other hand. Our main results are that the market-seeking motive is important and that market size variables related to the target increase the value of M&As. Furthermore, the results are consistent with Neary's (2008) prediction, insofar as the distance variable reflects integration. Concerning financial openness, the results are more ambiguous for countries that are already active in M&A activity; however, for the 'passive' group (i.e. countries that do not engage in M&A activity), financial openness seems to be a prerequisite to attract cross-border M&As.

The paper evolves as follows. In section 2 we present several stylized facts on FDI, and in particular on cross-border M&As; furthermore, we outline[5] how the recent rise of FDI, dominated by cross border M&As, can be reconciled with the ostensible increase of economic and financial integration. Section 3 discusses our estimation strategy and introduces our gravity model by focusing on the "zero-gravity" problem. Section 4 presents our estimation results, and section 5 concludes.

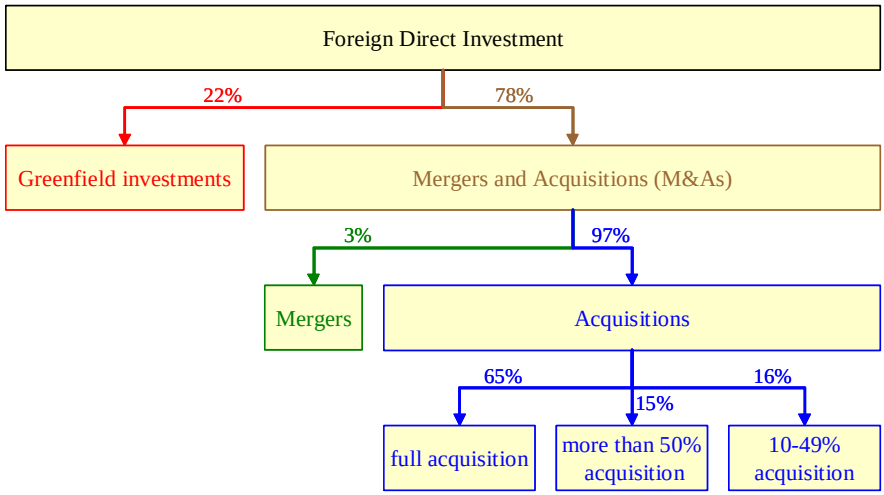
2. Cross-Border M&As and the Neary model

Looking at FDI as a broad category obscures the fact that most FDI is in the form of cross-border M&As. Figure 2 shows a decomposition of FDI and it is clear that M&As constitute the bulk of FDI, whereas Greenfield FDI is considerably less important than M&As. The main difference between these two forms of investments, is that in an M&A "control of assets and operations is transferred from a local to a foreign company, the former becoming an affiliate of the latter" (UNCTAD, 2000). However, it has not been until recently that models in international economics have started to emerge, which enable us to understand M&As. Neary's (2007) model takes the standard partial equilibrium explanations for M&As one step further. In the literature, two motives are mentioned to explain M&As: *a strategic motive* (reduce competition) and *an efficiency motive* (cost reductions).

[5] Using Neary (2007, 2008) which is our main point of reference.

An explanation of *cross-border* M&As, however, also has to explain the cross-border part of the deals. In this vein, trade theory suggests that comparative advantage could be included in a full or general equilibrium explanation of M&As. A different but equally novel line of research in international economics (see Barba-Navaretti and Venables, 2004; or Helpman, 2006 for surveys), seeks to understand the conditions under which firms decide to locate (part of) their production abroad (the so-called *off-shoring decision*). When they decide to offshore, some firms do so under the flag of FDI, while other firms go for outsourcing. However, in this stream of literature, and in contrast to its empirical relevance illustrated in Figure 2, the analysis of cross-border M&As is still in its infancy.

Figure 2 Distribution of different types of FDI



Source: Brakman et al. (2007); data: UNCTAD (2000); 78-22% split in value terms, other % in # of deals

Our overview of the structure of cross-border M&As is based on Thomson's *Global Mergers and Acquisitions Database*, which provides the best and most extensive data source for M&As to date. Its main sources of information are financial newspapers and specialized agencies like *Bloomberg* and *Reuters*. Our Thomson data set begins in 1979 and ends in August 2006. Initially, the focus in the Thomson data set was on American M&As; nevertheless, systematic M&A data for almost all countries is available from the mid 1980s onwards. Therefore, in presenting the data we will focus on the period 1986 – 2005.

We collected information on all completed /unconditional *cross-border* M&As with a deal value of at least $10 million, which means that for the period 1986 – 2005 we have 27,541 cross-border M&As. As Table 1 shows, most M&As result in effective ownership; furthermore, about 50% of M&As take place within the same sector (i.e. horizontal

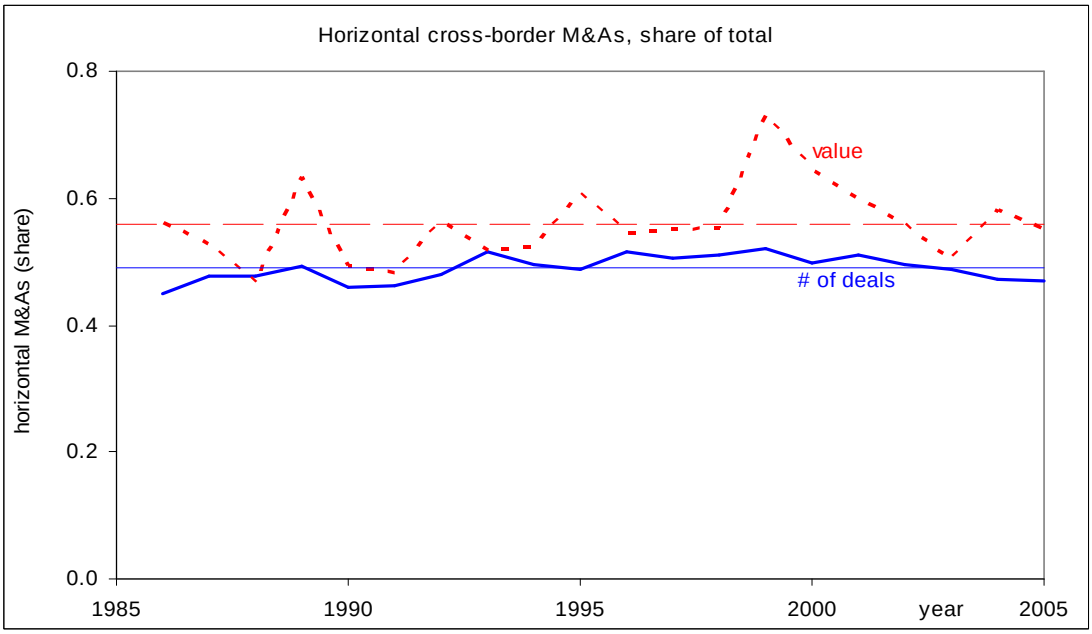
M&As). We can only speculate as to why this might be the case; however, as previously mentioned,[6] a likely explanation is that most cross-border M&A are market seeking. That is, taking one of your competitors out of the market reduces competition and raises profits. Furthermore, buying a firm outside one's own sector might be motivated by an efficiency motive, since it can be profitable to control a larger part of the value chain. Nonetheless, and regardless of the strategy, both motives increase profits after the take-over.

Table 1 Overview of cross-border M&As

	# of deals	per cent
Cross-border M&As, 1986-2005	27,541	
Effective M&As	27,461	99.7
Average per cent of shares acquired		75.5
Average per cent of shares owned after deal		80.1
# horizontal M&As (2-digit level)	13,605	49.4

Figure 3 illustrates that the share of horizontal M&As is very stable over time when measured by the *number* of deals; fluctuating around the average of 49 per cent (ranging from a low of 45.1 per cent in 1986 to a high of 51.5 per cent in 1996). Horizontal M&As are substantially more volatile when measured using the *value* of the deals; fluctuating around the average of 56 per cent, ranging from a low of 46.7 per cent in 1988 to a high of 73.0 per cent in 1999.

Figure 3 Horizontal (2-digit) cross-border M&As; share of total, # of deals and value

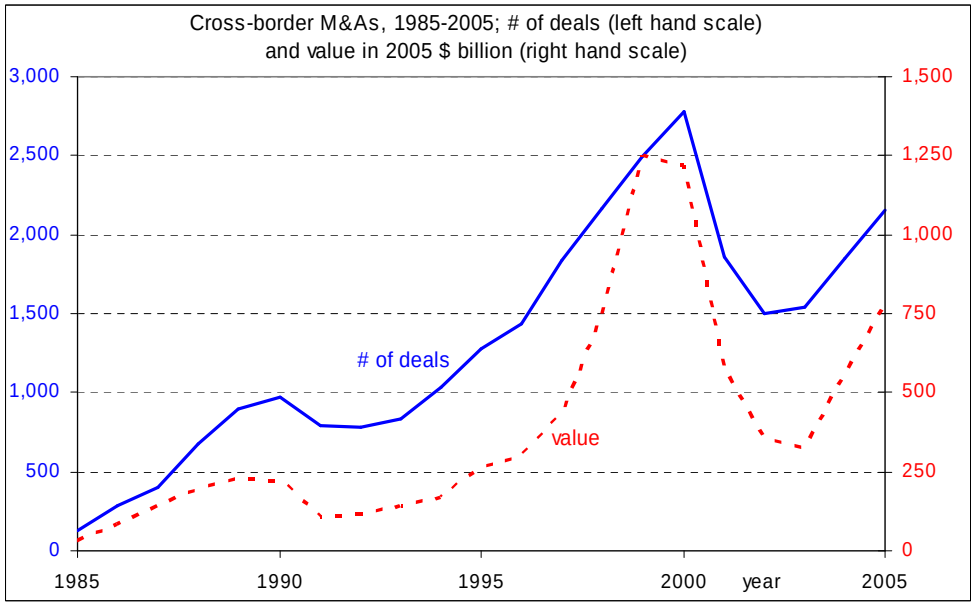


Horizontal lines indicate averages for the period 1986-2005.

[6] Of course, strategic motives may (also) be at work here.

Those who would argue that the value of horizontal M&As has declined since 1999, are obviously obscuring the fact that the 1999 peak is not representative over a longer time horizon. Moreover, the 2005 value of horizontal M&As of 55.2 per cent is very close to the long run average of 56 per cent. Using either measure we find little support for the argument that the share of horizontal M&As is declining. From an international economics perspective, the question arises whether existing theories of FDI can explain the dominance of horizontal FDI. On the face of it, this is not the case; assuming that during our sample period (1985-2005) trade costs (broadly defined) have decreased, the standard FDI model predicts that horizontal FDI should have become less important. In terms of the *proximity-concentration* trade-off, a drop in trade costs shifts the trade-off in favor of exporting. That is, with falling trade costs foreign markets might be better served by exporting instead of (horizontal) FDI. However, Neary (2008) shows that falling trade costs might nonetheless explain the rise of horizontal FDI, and thus the bulk of cross-border M&As.[7] See Box 1 for a summary of Neary's (2007 and 2008) reasoning. The puzzle put forward in this paper depends on whether or not trade integration has indeed taken place. Although the exact measurements of trade costs is difficult (see Anderson and Van Wincoop, 2004 for a discussion), the consensus is that transportation costs in the period under consideration have declined in general (Hummels, 2007).

Figure 4 Cross-border M&As, 1985 – 2005; # of deals and value



[7] Once we allow for an FDI model that explicitly incorporates the possibility of cross-border M&As, instead of merely looking at FDI as a black box (see Neary, 2007).

Box 1 - Cross-border M&As and Economic Integration

This box presents a simple way to look at a cross-border M&A. However, the reader must keep in mind that this box is more of a way of organizing thoughts, rather than a complete model but it illustrates the key issues involved (for a complete model, the reader is referred to Neary, 2007). Let "1" and "0" indicate the *post*- and *pre*-merger situation, respectively. Then the gain of taking over a Home firm, G_H, by a foreign firm is given by:

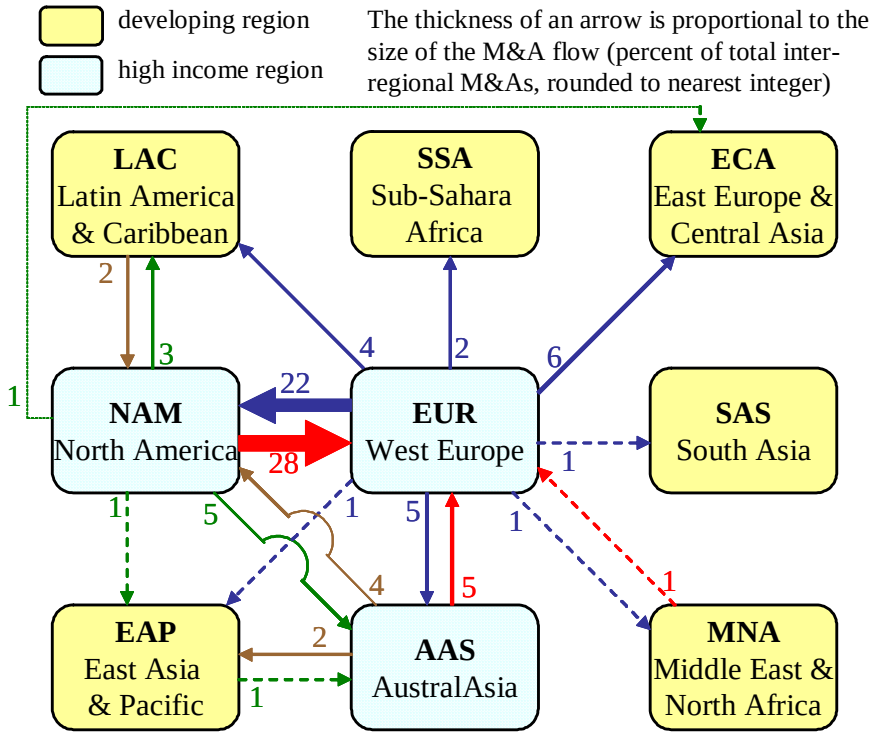
$$(1) \qquad G_H = \left[\pi_1^*(n-1, n^*|.) - \pi_0^*(n, n^*|.)\right] - \pi_0(n, n^*|.) > 0$$

The first term (in square brackets) relates to the gain in profitability from reduced competition by taking over the domestic firm; that is, the number of domestic firms is reduced by 1, from *n* to *(n-1)*. The number of foreign firms, n^*, does not change. The second term indicates the cost of acquiring the domestic firm. This is a function of profits of the target – the more profitable a target is the higher the take-over costs – and the cost of financing the take-over. If the acquirer has a windfall gain, for example, higher share prices due to the takeover, the finance costs are smaller The $|$. indicates that other variables are taken as given (for example cost factors that reflect differences in relative costs). The balance between the change in profits and the costs involved in the M&A determines whether a takeover will take place. The influence of the takeover cost is such that cost differences cannot be too large; otherwise, taking over a firm that is much more efficient than the acquirer is becomes too expensive.

How can economic integration (a fall in trade costs) go along with an increase in M&As? First, as Neary (2008) points out, the export platform argument offers an explanation that is in line with the *proximity-concentration* models that seek to explain horizontal FDI. Firms gain access to an integrated region by investing in one of its members in order to gain access to the overall region. However, in the context of equation (1), economic integration also leads to more horizontal FDIs, especially M&As, but for a different reason. For example, a reduction in trade barriers increases the profitability of an exporting firm in the foreign market, and this makes a takeover more likely. Moreover, a reduction in trade barriers also increases competition in both markets, since this increases the likelihood of a cross-border M&A (as takeover costs become smaller), but on the other hand, it also reduces profits of the acquirer, and this makes a takeover less likely. The balance is such that more economic integration leads to more M&As (Neary, 2007 and 2008)

A historical perspective reveals another remarkable characteristic of (cross-border) M&As. Figure 4 depicts the evolution of all cross-border M&As over time for our sample period, both measured as the number of deals and the value of deals (in constant 2005 $ bn., using the US GDP deflator). Clearly, even when looking at this relatively short period, there is substantial variation over time, with periods of rapid increase followed by periods of rapid decline. This corroborates the more general finding that M&As come in waves. To date, five merger waves have been identified throughout the 20th century, three of which took place after WWII (Andrade, Mitchell, and Stafford, 2001). The third wave took place in the late 1960-early 1970s. The fourth wave ran from (about) the mid 1980s until 1990. The fifth wave started around 1995 and ended in 2000 with the collapse of the "new economy". Figure 4 also shows that a subsequent sixth (still ongoing) merger wave started in the 21st century around 2003.[8]

Figure 5 Inter-regional cross-border M&As; % of total (value), 2001-2005



NB: all *intra*-regional M&As are excluded from the figure. The total value of *inter*-regional M&As is 100 per cent; only flows above 0.5 per cent are shown (this excludes 53 of 72 possible arrows).

In rounding-up our stylized facts discussion regarding cross-border M&As, we focus on *inter*-regional M&As in our sample (see also Appendix A). This gives us an indication of the extent to which different global regions interact with one another by delivering more

[8] Note that the data used in this paper covers the fourth and fifth waves.

valuable cross-border M&As. Figure 5 depicts the inter-regional cross-border connections for the period 2001-2005, rounded to the nearest integer. Since there are 9 global regions there are 72 different inter-regional connections.[9] First, we note that by far the largest and most valuable inter-regional M&A flows are from North America to Western Europe (28 per cent of the total), and vice versa (22 per cent of the total). Together these two flows account for 50 per cent of the value of all inter-regional M&As and clearly dwarf all other inter-regional connections. Second, Western Europe is buying substantial amounts of firms in Eastern Europe (6 per cent). Third, the other high-income region connections (between EUR and AAS and between NAM and AAS) are considerable (about 5 per cent each). Fourth, M&A flows toward East Asia and the Pacific are still rather small, certainly compared to the attention this receives in the popular media. Fifth, and finally, Western Europe is the M&A center of gravity *vis-à-vis* creating more value; in other words, it is the only global region with connections to all other regions.[10]

3. Methodology and Estimation Strategy

By now, a standard tool to deal with distance-related cross-border economic interactions like bilateral trade or FDI flows is the gravity model first developed by Tinbergen (1962). After a period in which the gravity model fell out of fashion for its lack of theoretical underpinnings (despite its empirical success), the gravity model has seen a revival as it has become clear that it can be derived from (a wide range) of theoretical models with solid micro-foundations (see Anderson and van Wincoop, 2003, for a trade survey and Bergstrand and Egger, 2007, for an FDI foundation). Notwithstanding this revival, the number of models that produce a gravity-type specification is relatively large, thereby making the gravity model inapt as a tool to discriminate between different theoretical trade models (see Deardorff, 1998; and Helpman et al, 2007). Our aim, however, is not to discriminate between theoretical trade models but merely to test the relevance of distance and other determinants for the value of bilateral M&A flows, specifically in relation to the hypotheses derived by Neary (2007 and 2008).

Econometrically, the estimations of the gravity model, be it for trade flows or FDI flows, are not without problems, given the "zero gravity problem" (see Anderson and van

[9] Only 19 of these flows appear in Figure 5, since the remaining 53 flows are rounded to 0 per cent. This already indicates that 'zero' observations are important in the sample, and are important for the estimates (see section 3).

[10] This is reminiscent of the role of Western Europe in inter-regional trade flows (van Marrewijk, 2007).

Wincoop, 2003; Feenstra, 2004; Baldwin and Taglioni, 2006; Bosker, 2008; Bosker and Garretsen, 2007). For our purposes this is an important issue, since the percentage of observations with "zero M&As", depending on the precise (sub) sample, is quite high (see next section). The existence of zero M&A flows constitutes a problem because the often-preferred log-linearized gravity specification is undefined for observations with zero flows. A proper handling of these zero observations is therefore important (see Santos-Silva and Tenreyro, 2006; Helpman et al. 2007; Baldwin and Harrigan 2007; Garita and van Marrewijk, 2008). Furthermore, OLS estimates of the log-linearized model may be both biased and inefficient in the presence of heteroskedasticity.

A common method of handling the "zero-gravity" problem thus far has been to simply discard the zeros by truncating the sample and using OLS, or simply to add a constant factor to each observation on the dependent variable and then estimate the gravity model through a Tobit estimation. These approaches are correct as long as the zero values are randomly distributed; however, if they are not random, as is often the case, then it introduces selection bias (see Bosker, 2008). Until recently, this problem has been ignored in gravity studies, but it can be handled by means of sample selection correction. In this light, Helpman, et al. (2007) propose a theoretical model rationalizing the zero trade flows and propose estimating the gravity equation with a correction for the probability of countries to trade. In order to estimate their model, they apply a two-step estimation technique (similar to sample selection models commonly used in labor economics). To implement the new estimator, one needs to find an appropriate exclusion restriction for identification of the second stage equation, which can be quite difficult.[11]

The above suggestion to distinguish between *two groups* of observations to adequately deal with the zero-flow problem can be done in an empirically flexible way by using Lambert's (1992) zero-inflated approach (aternative names are "with zeroes," "zero altered," and "hurdle" models), which is similar to the Heckman Selection model but does not rely on the associated normality assumptions, and is therefore less restrictive (Heckman, 1974, see

[11] One could argue that the 2-step estimation procedure used by Helpman et al. (2007) is not introduced for econometric purposes (i.e. to deal with the "zero gravity problem"), but follows directly from their preferred trade-theoretical model (in the tradition of Melitz, 2003). In the latter model, it is crucial to distinguish between the probability of trade and the volume of trade (or in their terminology, between the extensive and intensive margins of trade), which is exactly what their 2-step-estimation procedure does. As to the use of the exclusion restriction (a variable that in the 1st (probit) step is included to influence the probability of trade but is not part of the 2nd step as it is meant not to influence the volume of trade), Helpman et al. (2007) use religion (see also Bosker and Garretsen, 2008).

Razin and Sadka, 2007 for an application on FDI).[12] The zero-inflated model assumes that there are two latent groups of observations; an observation in the (always 0) *Passive Group* has an outcome of 0 with a probability of 1; an observation in the (potentially) *Active Group* might have a zero outcome, but there is a positive probability that there is a non-zero outcome. This process is developed in two stages:

(i) model membership into the latent groups (Active or Passive) using a logit model and observed characteristics (so-called "inflation" variables because they "inflate" the number of zeros).

(ii) model the value of cross-border M&As for observations in the Active Group via a Poisson or negative binomial regression.

The Poisson model imposes the restriction that the conditional mean of the dependent variable is equal to its variance. The negative binomial regression model generalizes the Poisson model by introducing an individual unobserved effect into the conditional mean which allows for over-dispersion in the data (see Blonigen, 1997; Coughlin, 2000; Wooldridge, 2002; and Barry, 2003). The approach can also use it for our non-integer data (the value of M&As; see Santos-Silva and Tenreyro, 2006, for trade flows). The Vuong (1989) test can be used for selection of non-nested models; repeated application provides overwhelming support in favour of the zero-inflated negative binomial (ZINB) model, such that we restrict attention below to reporting the ZINB results.

4. Estimation Results

4.1 Baseline estimations

To test the model outlined above from the acquirer's perspective, we analyze the value of cross-border M&As undertaken by firms in a specific country for the period 1986-2005, giving us a total of almost 1 million observations. For both the acquiring and target country, and in line with the gravity approach, we include *GDP* and *GDP per capita* as explanatory variables. As with bilateral trade, we expect GDP (per capita) to have a positive effect on cross border M&A for both the acquiring (exporting) and target (importing) country. The bilateral (geodesic) distance ($Dist_{ij}$) between countries *i* and *j* is also included. As previously mentioned, cross-border M&As come in waves. Therefore, in order to deal with this feature we construct two variables $Wave_1$ and $Wave_{2,}$ where the former (latter) denotes the number of cross border M&As in the year (two years) prior to time *t*.

[12] This avoids the difficulty of trying to find an appropriate exclusion restriction (Helpman *et al*, 2007).

The variables *common language*, *colony*, and *common border* capture the transaction- or information costs associated with cross border M&As; they are taken from the CEPII database. We also include *de jure* financial openness in our baseline specification, since cross border M&As are an example of international capital flows. This variable (measured by the Chinn-Ito index) is thought to have a positive effect on M&As, in particular where it concerns the financial openness of the target country.[13] As we explained in section 2, set against the recent FDI models, the rise of FDI (*in casu*, cross border M&As) is not easy to reconcile with ongoing economic integration (falling trade or transport costs). Apart from economic integration, and different from gravity models of international trade, we expect that cross border M&As are also (or even mainly) driven by the degree of financial integration and/or other financial variables. When changing our baseline specification we will include various financial variables. In addition, we incorporate regional fixed effects (for the regions introduced in Figure 5). Note, that these region fixed effects are different from the country-based distance effects.

Table 2 presents the estimation results for our baseline 'gravity' model. The columns related to the active group give estimates for the group for which the observations are not necessarily zero, the columns with respect to the passive group give estimates for the always-zero group of observations. With the exception of the wave variables, we use the same characteristics for both groups. The signs for these variables are often opposite, which makes intuitive sense. Note that we have indeed a very large number of zero observations. The estimation results for the Active Group in Table 2 show that typical gravity variables help to explain the value of cross-border M&As between countries. A larger market size as measured by GDP leads to a higher value of M&As both from an acquirer and target perspective. GDP per capita only has a positive effect on the value of M&As from the target perspective, indicating that market size is not the only income effect determining the value of M&As, but also that the distribution of income is important. Regarding financial openness, we find that it is a *prerequisite* for M&As to take place (the variables are strongly significant in the column for the Passive Group), but that it is relatively unimportant in determining the value of M&As. Capital mobility seems to act as a cut-off or hurdle variable; without capital mobility M&As are unlikely to occur at all.

[13] See Chinn and Ito (2002, 2005) for more details on this index.

Table 2 Baseline ZINB estimates

	Active Group Negative Binomial coefficient	inc. rate ratio	Passive Group Logit coefficient
Ln(GDP)			
acquirer	0.347***	100	-0.680***
target	0.372***	110	-0.708***
Ln(GDP per capita)			
acquirer	0.139		-1.354***
target	0.342***	49	-0.601***
$Ln(Dist_{ij})$	-0.285***	-22	0.787***
Financial Openness			
acquirer	0.055***	9	-0.161***
target	0.028		-0.072***
$Wave_1$	0.00010**	7	
$Wave_2$	0.00022***	31	
Common Language[a]	0.400***	49	-1.143***
Colony[a]	0.454***	58	-1.022***
Common Border[a]	-0.136*	-13	-0.441***
McFadden adj. R^2	0.241	Region fixed-effects	yes
Observations	255,468	Non-zero obs.	5,290

Zero Inflated Negative Binomial regression. Dependent variable is value of bilateral cross-border M&As. *, **, and *** indicate significance at 10%, 5%, and 1% level. For at least 10% significant variables: the coefficients can be interpreted as elasticities; the incidence rate ratio is calculated as: 100×[exp(β)×std.dev.-1]. Incidence ratio's indicate the (percentage) change in the value of M&A if a variable changes by a standard deviation.

[a] inc. rate ratio is calculated as: 100×[exp(β)-1] for a discrete change from 0 to 1.

What is the relation between economic integration (here approximated by the distance variable D_{ij}) and M&As? If distance proxies increased economic integration, then we find evidence in favor of Neary's GOLE model. That is, increased economic integration increases competition in the home market, which lowers profits of the target (and acquirer) and makes a takeover more likely. In addition, increased integration makes profits of the acquirer in foreign markets larger, which also increases the probability of a takeover, but profits of the target also increase, which makes the probability smaller. The balance of all effects is positive (Neary, 2008). The negative sign of the *distance* variable is consistent with this line of reasoning that is, the lower the distance, the higher the value of M&As. In addition, the wave variables further validate Neary's model, since initial M&As stimulate further M&As because profits in the market increase with less competitors. These effects of economic integration are enlarged by the results for *common language* and *colony*; if

integration takes place in already culturally integrated areas (e.g. areas that share the same jurisprudence), then this further stimulates M&As. In contrast to the standard effect for trade flows, the effect of a *common border* on M&A activity is negative. This is in line with expectations: given that an M&A takes place, the negative border effect indicates that firms want to create some distance. For nearby economies, alternative modes of entry are available. For example, at close range, exporting might be more profitable than setting up shop in foreign markets.

4.2 - Baseline estimation sensitivity analysis

We also investigated the robustness of our results, by augmenting our baseline model with several "pull" and "push" factors that are considered important determinants of cross-border M&As (see Appendix B for estimation results). That is, while “push” factors may help explain the timing and magnitude of new capital inflows, “pull” factors may be necessary to explain the regional distribution of new capital flows (Montiel and Reinhart, 1999).

4.2.1 - US interest rates

An important "push" factor is the level of interest rates in the home country, which we will proxy by the 10-year US bond yield. In the literature, there is a consensus that high real interest rates hamper FDI, other things being equal. Albuquerque et al. (2005) find a significant and negative relation between the US T-Bill yield and FDI inflows; moreover, Calvo et al. (2001) show that FDI inflows to emerging markets are lower during US monetary tightening. Our results are in line with the literature as far as the Active Group is concerned, since the *US yield* coefficient is negative and a one standard deviation increase in US interest rate decreases the value of M&A activity by over 10%.

4.2.2 – Market structure

Unlike the surge in capital inflows to developing countries in the 1970s and early 1980s, which were almost exclusively driven by commercial bank lending, capital inflows in the 1990s were associated with a stern rise in bond and equity portfolio inflows; much of these inflows have gravitated towards larger equity emerging markets, bypassing many countries (Montiel and Reinhart, 1999). An often given explanation is that markets must overcome a threshold set of requirements (market size, accounting standards, disclosure requirements, transparency, etc.) in order to attract capital flows. Accordingly, we augment our model by including the lagged stock market capitalization as proxy for the size of the domestic

capital market (an indirect proxy for the size of the banking sector, see Montiel and Reinhart, 1999); we lag this variable to take care of any endogeneity issues. The results are mixed. For the Active Group only the acquirer seems to benefit from a more developed stock market. For the passive group, the odds of remaining in this group decrease for the acquirer if the capitalization of the stock market increases; however, the odds of remaining inactive in M&As increase for the target as the stock market capitalization increases. We also add the Transparency International corruption index[14] (labeled *Transparency*) to proxy for the business environment in the local economy. The results are in line with expectations, where a less uncertain business environment will increase the value of M&As for the target country in the Active Group by 28%.[15] For the Passive Group, making the business environment more transparent reduces the odds of remaining in this group for both acquirer and target by about 10%.

4.2.3 – Macroeconomic Distortions

We use the black market premium as a measure of expected depreciation of the local currency and an index of distortions. Expectated depreciation affects investment through several channels: (1) it is more attractive to hold foreign assets; (2) economic uncertainty is higher; (3) foreign capital goods are cheaper to import at the official rate. The first two points suggest a negative relationship between the black market premium and foreign investment while the third point implies the opposite. As an indicator of distortions the black market premium should be negatively correlated with the value of M&As. This is in line with our findings as a one standard deviation increase in the black market premium reduces the value of cross-border M&As for the Active Group by 30% and increases the odds of remaining in the Passive Group by 44%. Regarding the link between FDI and exchange rate uncertainty[16] the literature is mixed, as volatility can both discourage FDI (Cushman, 1988) and produce an incentive to hedge against exchange rate shocks through foreign location (Aizenman, 1991). In our comprehensive study we find that these two forces balance as exchange rate volatility does not influence the value of cross-border M&As (in contrast to Blonigen, 1997, and Froot and Stein, 1991).

[14] The Transparency International corruption index ranges from 0 = highly corrupt, to 10 = highly clean.
[15] The coefficient for the acquirer is not significant.
[16] As measured by the coefficient of variation of the bilateral exchange rate.

4.3 Market Potential

Following Blonigen et al. (2007), we introduce the market potential of the target country in our model among the set of regressors to analyze the economic platform motive for M&As. This variable is the distance weighted GDP of countries surrounding the target country, where distance is measured in proportion to the distance between Brussels and Amsterdam (173 km, in accordance with Blonigen et al, 2007).[17] We find a *negative* effect for the market potential variable; this implies that a different market is more attractive as a target destination than as an attractive export platform. We conclude that the export platform FDI motive is not sustained by our data (see Table 3), in line with Blonigen et al. (2007). The other variables are consistent with our earlier findings; thereby indicating that GDP of the target is the dominant variable.

Table 3 Outside market potential ZINB estimates

		Active Group Negative Binomial	Passive Group Logit
Ln(GDP)			
acquirer		0.269***	-0.650***
target		0.160***	-0.668***
Ln(GDP per capita)			
acquirer		0.252**	-1.497***
target		0.410***	-0.690***
Ln(outside market potential$_{tar}$)		-0.284***	0.784***
Ln(Dist$_{ij}$)		-0.260***	0.915***
Financial Openness			
acquirer		0.050**	-0.122***
target		0.009	-0.058***
Wave$_1$ (coef × 100)		0.008	
Wave$_2$ (coef × 100)		0.024***	
Common Language		0.411***	-0.831***
Colony		0.618***	-1.135***
Common Border		-0.094	-0.289***
Observations	184,702	Region. fixed-effects	yes
Non-zero obs.	3,012	McFadden adj R^2	

Zero Inflated Negative Binomial regression. Dependent variable is value of bilateral cross-border M&As. *, **, and *** indicate significance at 10%, 5%, and 1% level.

[17] Distances below 173 km are set equal to the normalization. Note that GDP of the target country itself is *not* included in thie outside measure as it is already included separately.

4.4 The baseline model over time

We are not only interested in the impact of distance (or economic integration) and financial openness on the value of cross border M&As as such, but also on changes in this relation over time. We thus estimated our baseline model in four 5-year periods (1986-1990, 1991-1995, 1996-2000, and 2001-2005). As previously mentioned, our working assumption is that both economic and financial integration have increased in our sample period[18]; therefore, we expect the effect of distance to change over time.[19] Firstly, Table 4 shows that the results do not differ markedly from those for the total sample period regarding the impact of GDP (per capita), waves, common border, and common colony.

The distance coefficients for both the Active and Passive Groups have increased in absolute value terms (these results are similar to Disdier and Head, 2008), implying that distance has become more important over time.[20] This holds in particular for the Passive Group coefficients. Two observations are important. First, why has the measured impact effect of distance increased over time? To understand this, one must realize that the estimated coefficients are reduced form estimates of equilibrium M&A decisions under changing circumstances. Economic integration is a *local* phenomenon (EU integration focuses on neighbouring European countries, and similarly for NAFTA, ASEAN, etc.) which increases the attractiveness of nearby M&As, to which firms respond by engaging more in local M&A activity. This, in turn, is reflected in the increased impact of distance on M&As, particularly for the Passive Group. Second, what do the changed coefficients imply? In a nutshell, the higher impact of distance on M&As indicates that economic integration (reduction of distance, broadly measured) is becoming more important over time.

The effects of common language follow a similar pattern as the distance coefficients; that is the coefficients increase over time (in absolute value) for both the Active and Passive Groups. This implies that as countries have moved to reduce transaction (business) costs between them, the value of cross-border M&As has increased accordingly. The effect of *colony* on the value of M&As decreases over time for the Active Group, whereas it remains relatively satble over time for the Passive Group. Regarding the common border effect, we find that it is relatively stable over time, but only affects the Passive Group. In other words,

[18] Granted that, as is standard in gravity studies, distance not only reflects actual transport costs, but also other forms of trade barriers.

[19] Keep in mind Neary (2008) and Appendix A, where economic integration is bound to have a positive impact on cross border M&As.

[20] The only exception is the drop in value for the most recent period for the Active Group.

as economic integration increases, and countries start to 'share' a common border, the odds of remaining in the Passive Group decrease considerably (approximately by 40%).

Table 4 Baseline ZINB estimates, separate periods

	1986-1990	1991-1995	1996-2000	2001-2005
Active Group; Negative Binomial coefficients				
Ln(GDP)				
acquirer	0.354***	0.287***	0.365***	0.368***
target	0.423***	0.333***	0.417***	0.302***
Ln(GDP per capita)				
acquirer	0.039	0.078	0.257*	-0.066
target	-0.354**	0.300***	0.400***	0.338***
$Ln(Dist_{ij})$	-0.256***	-0.269***	-0.361***	-0.279***
Financial Openness				
acquirer	0.084	0.064	0.225***	-0.023
target	0.112*	0.128***	0.024	0.000
$Wave_1$	0.0003	0.0003*	0.0001	0.0002
$Wave_2$		0.0005*	0.0003***	0.0005**
Common Language[a]	0.170	0.223*	0.587***	0.457***
Colony[a]	0.748***	0.341**	0.574***	0.390**
Common Border[a]	-0.213	-0.252*	-0.165	0.112
Passive Group; Logit coefficients				
Ln(GDP)				
acquirer	-0.595***	-0.649***	-0.691***	-0.727***
target	-0.671***	-0.662***	-0.718***	-0.765***
Ln(GDP per capita)				
acquirer	-1.378***	-1.032***	-1.365***	-1.534***
target	-1.167***	-0.703***	-0.497***	-0.566***
$Ln(Dist_{ij})$	0.564***	0.772***	0.793***	0.910***
Financial Openness				
acquirer	-0.327***	-0.263***	-0.116***	-0.074***
target	-0.196***	-0.124***	-0.024	0.006
Common Language[a]	-0.716***	-1.246***	-1.094***	-1.244***
Colony[a]	-1.145***	-1.041***	-1.018***	-1.038***
Common Border[a]	0.269	-0.500***	-0.399***	-0.438**
McFadden adj. R^2	0.272	0.254	0.232	0.235
Observations	68,209	67,514	88,972	57,683
Non-zero obs.	667	1,235	2,242	1,288
Region. fixed-effects	yes	yes	yes	Yes

Zero Inflated Negative Binomial regression. Dependent variable is value of bilateral cross-border M&As. *, **, and *** indicate significance at 10%, 5%, and 1% level.

5. Conclusions

Most FDI is between similar (developed) countries, predominantly in the form of M&As. This suggests that the market-seeking motive of FDI dominates the data. At present, this seems to be the consensus in the literature. The empirical puzzle identified by Neary (2008) is that we have witnessed both an increase of cross-border M&As and increased economic integration. If the market-seeking motive indeed dominates the data these facts provide us with a puzzle because increased integration should result in less M&As as markets can more easily be served through exports instead of FDI. Neary (2008) suggests two solutions to the puzzle: the export platform motive for FDI, and the profit-seeking motive that follows from his own GOLE model. In the former case, FDI in a specific country gives access to surrounding markets, whereas in the latter case M&As take place through a subtle balancing act between higher profits and higher takeover costs. Using a zero-inflated negative binomial model, we find evidence:

- against the export platform motive; target GDP is more important than distance weighted GDP of surrounding countries (with a negative impact).
- in favor of Neary's (2008) GOLE model for M&As in a world characterized by increased economic integration.
- in support of financial openness as a necessary condition for M&As to take place; once a threshold level is reached, financial openness has little impact on the value of M&As.
- confirming the impact of ongoing economic integration on M&As, which like trade flows are becoming more local (impact of distance increases over time).

Appendix A - Regional distribution of cross-border M&As

Table A1 - Regional distribution of cross-border M&As, 2000-2005

a. Number of deals (% of total); shaded cells: higher than 0.5%

from	AAS	EAP	ECA	EUR	LAC	MNA	NAM	SAS	SSA	sum
AAS	5.7	2.7	0.1	1.8	0.1	0.0	2.2	0.4	0.1	13.1
EAP	0.7	1.0	0.0	0.2	0.1	0.0	0.2	0.0	0.0	2.2
ECA	0.0	0.0	1.1	0.2	0.0	0.0	0.1	0.0	0.0	1.4
EUR	2.5	1.3	3.4	26.5	2.6	0.4	9.7	0.8	0.6	47.8
LAC	0.0	0.0	0.0	0.1	1.6	0.0	0.4	0.0	0.0	2.1
MNA	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1
NAM	3.1	1.2	0.8	11.2	2.1	0.1	12.1	0.4	0.3	31.2
SAS	0.1	0.0	0.0	0.2	0.0	0.0	0.2	0.2	0.0	0.9
SSA	0.2	0.1	0.0	0.3	0.0	0.0	0.1	0.1	0.3	1.2
sum	12.2	6.3	5.5	40.6	6.6	0.6	25.0	2.0	1.3	100

b. Value of deals (constant 2005 $, % of total); shaded cells: higher than 0.5%

from	AAS	EAP	ECA	EUR	LAC	MNA	NAM	SAS	SSA	sum
AAS	3.0	1.5	0.0	1.9	0.1	0.0	2.1	0.1	0.0	8.7
EAP	0.3	0.4	0.0	0.2	0.0	0.0	0.1	0.0	0.0	1.0
ECA	0.0	0.0	0.9	0.1	0.0	0.0	0.0	0.0	0.0	1.0
EUR	2.0	0.5	2.2	38.1	2.7	0.3	15.8	0.2	0.6	62.4
LAC	0.0	0.0	0.0	0.0	1.0	0.0	0.6	0.0	0.0	1.5
MNA	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.4
NAM	1.8	0.4	0.4	10.5	1.2	0.0	9.9	0.1	0.1	24.3
SAS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
SSA	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.4
sum	7.1	2.9	3.5	51.3	5.0	0.4	28.6	0.4	0.9	100

c. Ratio of value of deals (% of total) to number of deals (% of total)
shaded cells: higher than 1

from	AAS	EAP	ECA	EUR	LAC	MNA	NAM	SAS	SSA	sum
AAS	0.5	0.6	0.5	1.0	0.5	0.1	1.0	0.2	0.2	0.7
EAP	0.4	0.4	0.2	0.9	0.3	5.3	0.4	0.1	0.1	0.4
ECA	0.7	na	0.8	0.6	na	0.2	0.4	na	1.3	0.7
EUR	0.8	0.4	0.6	1.4	1.0	0.8	1.6	0.2	1.1	1.3
LAC	na	0.2	0.1	0.1	0.6	0.2	1.6	na	na	0.7
MNA	3.7	na	na	6.3	na	0.4	na	0.2	0.1	2.6
NAM	0.6	0.4	0.5	0.9	0.6	0.3	0.8	0.2	0.3	0.8
SAS	0.2	0.1	1.8	0.2	0.1	0.1	0.1	0.2	0.9	0.3
SSA	0.2	0.2	0.1	0.5	0.7	0.0	0.6	0.2	0.4	0.4
sum	0.6	0.5	0.6	1.3	0.8	0.7	1.1	0.2	0.7	1

Appendix B - Baseline estimations with different financial market variables

Table B1 - Exchange rate variability ZINB estimates

	Active Group Negative Binomial		Passive Group Logit
	coefficient	inc. rate ratio	coefficient
Ln(GDP)			
acquirer	0.309***	85	-0.672***
target	0.351***	101	-0.711***
Ln(GDP per capita)			
acquirer	0.213**	28	-1.383***
target	0.339***	49	-0.600***
$Ln(Dist_{ij})$	-0.271***	-21	0.837***
Financial Openness			
acquirer	0.024		-0.173***
target	0.045**	7	-0.097***
$Wave_1$	0.00015***	10	
$Wave_2$	0.00019***	27	
Exchange rate var.	0.036		0.055
Common Language[a]	0.610***	84	-1.050***
Colony[a]	0.387***	47	-1.092***
Common Border[a]	-0.225**	-20	-0.311***
McFadden adj. R^2	0.249	Region. fixed-effects	yes
Observations	211,256	Non-zero obs.	3,921

Zero Inflated Negative Binomial regression. Dependent variable is value of bilateral cross-border M&As. *, **, and *** indicate significance at 10%, 5%, and 1% level. For at least 10% significant variables the incidence rate ratio is calculated as: 100×[exp(β)×std.dev.-1].
[a] inc. rate ratio is calculated as: 100×[exp(β)-1] for a discrete change from 0 to 1.

Table B2 - US yield ZINB estimates

	Active Group Negative Binomial		Passive Group Logit
	coefficient	inc. rate ratio	coefficient
Ln(GDP)			
acquirer	0.343***	99	-0.671***
target	0.383***	115	-0.710***
Ln(GDP per capita)			
acquirer	0.399***	59	-1.333***
target	0.341***	49	-0.587***
$Ln(Dist_{ij})$	-0.290***	-22	0.765***
Financial Openness			
acquirer	0.078***	13	-0.178***
target	0.039**	6	-0.089***
US yield	-11.975***	-13	11.858***
Common Language[a]	0.421***	52	-1.131***
Colony[a]	0.493***	64	-1.011***
Common Border[a]	-0.114		-0.366***
McFadden adj. R^2	0.241	Region. fixed-effects	yes
Observations	282,378	Non-zero obs.	5,432

Zero Inflated Negative Binomial regression. Dependent variable is value of bilateral cross-border M&As. *, **, and *** indicate significance at 10%, 5%, and 1% level. For at least 10% significant variables the incidence rate ratio is calculated as: 100×[exp(β)×std.dev.-1].
[a] inc. rate ratio is calculated as: 100×[exp(β)-1] for a discrete change from 0 to 1.

Table B3 - Black market premium ZINB estimates

	Active Group Negative Binomial		Passive Group Logit
	coefficient	inc. rate ratio	coefficient
Ln(GDP)			
acquirer	0.330***	85	-0.638***
target	0.379***	103	-0.643***
Ln(GDP per capita)			
acquirer	0.424***	64	-1.386***
target	0.256***	35	-0.579***
$Ln(Dist_{ij})$	-0.289***	-23	0.611***
Ln(Black market prem)			
acquirer	-0.160***	-26	0.194***
target	0.003		0.202***
$Wave_1$	0.00054***	42	
$Wave_2$	-0.00037***	-26	
Common Language[a]	0.332***	39	-0.898***
Colony[a]	0.556***	74	-1.046***
Common Border[a]	-0.248**	-22	-0.185
McFadden adj. R^2	0.226	Region. fixed-effects	yes
Observations	94,182	Non-zero obs.	2,595

Zero Inflated Negative Binomial regression. Dependent variable is value of bilateral cross-border M&As. *, **, and *** indicate significance at 10%, 5%, and 1% level. For at least 10% significant variables the incidence rate ratio is calculated as: 100×[exp(β)×std.dev.-1].
[a] inc. rate ratio is calculated as: 100×[exp(β)-1] for a discrete change from 0 to 1.

Table B4 - Transparency ZINB estimates

	Active Group Negative Binomial		Passive Group Logit
	coefficient	inc. rate ratio	coefficient
Ln(GDP)			
acquirer	0.338***	98	-0.677***
target	0.410***	129	-0.694***
Ln(GDP per capita)			
acquirer	0.204*	27	-0.963***
target	0.103*	13	-0.426***
$Ln(Dist_{ij})$	-0.295***	-22	0.763***
Financial Openness			
acquirer	0.107***	19	-0.248***
target	0.042*	7	-0.104***
Transparency			
acquirer	-0.008		-0.070***
target	0.083***	28	-0.062***
$Wave_1$	0.00002		
$Wave_2$	0.00023***	31	
Common Language[a]	0.408***	50	-1.095***
Colony[a]	0.452***	57	-0.981***
Common Border[a]	-0.199**	-18	-0.492***
McFadden adj. R^2	0.246	Region. fixed-effects	yes
Observations	197,785	Non-zero obs.	4,002

Zero Inflated Negative Binomial regression. Dependent variable is value of bilateral cross-border M&As. *, **, and *** indicate significance at 10%, 5%, and 1% level. For at least 10% significant variables the incidence rate ratio is calculated as: 100×[exp(β)×std.dev.-1].
[a] inc. rate ratio is calculated as: 100×[exp(β)-1] for a discrete change from 0 to 1.

Table B5 - Lagged Stock Market Value ZINB estimates

	Active Group Negative Binomial		Passive Group Logit
	coefficient	inc. rate ratio	coefficient
Ln(GDP)			
acquirer	0.356***	106	-0.654***
target	0.342***	101	-0.739***
Ln(GDP per capita)			
acquirer	-0.144		-0.931***
target	0.343***	49	-0.632***
$Ln(Dist_{ij})$	-0.286***	-22	0.769***
Financial Openness			
acquirer	0.064**	11	-0.203***
target	0.030		-0.116***
Lag Stock Market Val.			
acquirer	0.005***	22	-0.008***
target	0.001		0.003***
Common Language[a]	0.252***	29	-0.972***
Colony[a]	0.571***	77	-0.972***
Common Border[a]	-0.279***	-24	-0.442***
McFadden adj. R^2	0.252	Region. fixed-effects	yes
Observations	203,960	Non-zero obs.	3,608

Zero Inflated Negative Binomial regression. Dependent variable is value of bilateral cross-border M&As. *, **, and *** indicate significance at 10%, 5%, and 1% level. For at least 10% significant variables the incidence rate ratio is calculated as: 100×[exp(β)×std.dev.-1].
[a] inc. rate ratio is calculated as: 100×[exp(β)-1] for a discrete change from 0 to 1.

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