

# **Syndication to Overcome Transaction Costs of Cross-border Investments?**

## **Evidence from a Worldwide Private Equity Deals' Dataset**

Tereza Tykvová (ZEW Mannheim)\*

Andrea Schertler (Kiel University)

**Abstract:** Using a new dataset on worldwide private equity deals we show that physical distance considerably shapes the geographical investment patterns of these investors. However, the negative impact of long distances on private equity investors' funding decisions may be mitigated when far away investors syndicate with local partners from the recipients' countries. In particular, inexperienced distant private equity financiers might profit from the know-how and local presence of veteran investors when they do joint deals. Syndication between foreign and local investors seems to be particularly strong in countries with developed local private equity industries. Moreover, we demonstrate that small deals are more strongly discouraged by long distances than large ones.

*Keywords: Private Equity, Internationalization, Syndication.*

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\* Corresponding author: Tereza Tykvová, ZEW Mannheim, Dept. of International Finance and Financial Management, L 7,1, D-68161 Mannheim, Germany. Phone: +49/621/1235-147. Fax: +49/621/1235-223. Email: [tykvova@zew.de](mailto:tykvova@zew.de)

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## ***1 Introduction***

Cross-border private equity transactions have experienced rapid growth in recent years. Temple (1999) calls private equity investors the “secret multinationals of the new millennium”. Foreign venture capital and private equity investors have participated in over 35 percent of more than 28,000 worldwide deals (i.e. in nearly 10,000 deals) in 2000-2006, with this fraction varying between 24 percent in the U.S. and 82 percent in Korea (see Table 1). Given this magnitude it is surprising that academic literature on the determinants of countries’ venture capital and private equity investments largely ignores the international component. The existing between-country comparisons, which view venture capital and private equity as a localized activity, start with the study by Jeng and Wells (2000) and were followed by others, e.g. Da Rin *et al.* (2006), Romain and van Pottelsberghe (2004) or Schertler (2007). However, research going beyond the between-country comparisons towards studies of across-country activities, i.e. of the geographical investment patterns of venture capital and private equity investors and motives behind their internationalization efforts, remains very rare (see Wright *et al.* 2005). Most of the existing investigations within this rather new research field are based on relatively small samples of investors and target companies (typically from one or only a low number of countries) or on case studies (e.g. Mäkelä and Maula 2006, Bruner and Chaplinsky 2002, Ribeiro and Carvalho 2008, Dixit and Jayaraman 2001, Wright *et al.* 2002, Manigart *et al.* 2006).

In approximately half of all cross-border venture capital and private equity deals several investors team up (see Table 1). A prevalent pattern in such syndicated cross-border transactions is a joint participation of a foreign and a local investor. A local investor from the country of the deal emerges as a syndication partner of the foreign investor in remarkable 87% of syndicated cross-border deals (see Table 1). From this perspective it astonishes that up to now, leaving aside some case studies and investigations within small samples (e.g. Hommel *et al.* 2006, Mäkelä and Maula 2008, Mäkelä 2004, Wright and Meuleman 2008), there has been no systematical examination of the motives behind this widespread phenomenon and its impact on the geography of venture capital and private equity investments.

One reason for this unsatisfactory situation has certainly been the lack of data. Our study makes use of a rather new deal database and analyzes the worldwide geographical investment and syndication

patterns of venture capital and private equity<sup>1</sup> investors with a particular focus on the role of physical distance between these investors and their (potential) investees. To the best of our knowledge, we are the first to offer an empirical investigation of the determinants behind cross-border private equity transactions around the globe and the motives behind worldwide cross-border syndication.

In the first part of our study, we are particularly interested in how physical distance influences the decision of private equity investors where to put their money. To look into this issue we focus on the worldwide cross-border private equity investments on an aggregate country-pair level. We argue that distance impacts direct as well as indirect (information-related) transaction costs, which are both decisive for this type of capital flows. Physical distance between the investor and the (potential) investment is conjectured to discourage private equity flows, especially when the distant investor does not have any experience in the country of the investment.

Besides the intensity of bilateral-country cross-border private equity flows, we look, in the second part of our study, into the investor structure behind international private equity transactions on the country, but also on the transaction level and its relation to physical distances between the investors and their investees. In particular, we concentrate on the widespread phenomenon of the syndication between foreign and local investors. The starting point of this analysis is the conjecture that the cooperation between foreign and local investors may render several advantages. Whereas the foreign partner can be helpful for the implementation of the company's internationalization strategy (e.g. Mäkelä and Maula 2005), the inclusion of the local partner, who is placed nearby the company, has superior knowledge on the local market, technology and legal environments, possesses linguistic skills and valuable contacts, may help reduce the transaction costs arising on long distances. The main research question in the second part of our analysis, thus, is whether foreign private equity investors are more prone to finance distant transactions when the deal can be syndicated with a local investor, respectively with a partner who possesses experience in the country of the investment.

Our main results are the following: First, physical distance strongly discourages cross-border private equity transactions and, thus, decisively impacts the geography of private equity investments. Second,

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<sup>1</sup> In what follows, we use a broad definition of private equity, which also includes venture capital as a subsample of it.

syndication of foreign private equity investors with local and experienced veteran partners seems to facilitate their distant transactions.

The contribution of our research to the existing literature is threefold. First, our study is related to the literature on the syndication of private equity investments. Private equity investors typically form syndication networks (e.g., Sorenson and Stuart 2001, Lerner 1994, Hochberg *et al.* 2007) in order to achieve portfolio diversification, generate an additional deal flow as well as share information. Moreover, through the syndicate partners' complementary skills and contact networks (Lindsey 2008, Hsu 2004), they are able to create additional value in their portfolio companies when they invest together (Cumming and Walz 2004, Brander *et al.* 2002). Beyond the gains from syndication discussed in the literature so far, which mainly focus on syndication among local investors and ignore the cross-border component, our study points to another benefit from syndication, namely the facilitation of cross-border investments.

Second, more generally, our research adds to the extant literature on international capital flows. While little is known about cross-border private equity transactions, a considerable amount of research has been carried out into other types of international capital flows. Several of these studies put particular emphasis on the role of physical distance. Portes *et al.* (2001) and Portes and Rey (2005), for example, identify a strong negative impact of distance on trade in corporate equities, corporate bonds and government bonds as well as on international equity flows in general. They claim that their findings might be, at first sight, quite surprising and puzzling since assets are weightless and, thus, transport costs are irrelevant. They argue that informational asymmetries are responsible for the strong negative relationship between cross-border asset flows and distance as countries which are near each other tend to know much more about each other. Our results on cross-border private equity flows suggest that for this asset class transaction costs play a decisive role as well and we argue that here not only information-related but also transport costs are relevant. Moreover, beyond what has been studied by previous literature on international capital flows, we also look into the impact of distance on cross-border syndication.

Third, our analysis adds to the emerging literature on internationalization in private equity industries. Internationalization may constitute an additional dimension for diversification within private equity

investors' portfolios, which has largely been ignored in the academic literature so far. As mentioned above, the majority of existing studies in this area are descriptive. A few studies constitute interesting exceptions. Kaplan *et al.* (2007) and Lerner and Schoar (2005) investigate the impact of different legal systems on the contracts and securities' types used. Guler and Guillén (2005) analyze the determinants of cross-border investments by U.S. private equity investors. Our study also gives useful insights into the determinants of cross-border transactions. However, we focus not only on the cross-border private equity flows per se but also on the structure of the investor pool behind these transactions. Moreover, in contrast to the above mentioned study on cross-border investments of U.S. investors, we cover worldwide transactions. Finally, Cumming and Johan (2007a, 2007b) investigate institutional investors' allocation of funds to domestic and foreign private equity investors, another dimension of internationalization within private equity industries we do not consider.

The remainder of the paper is organized as follows. In Section 2, we discuss the role of distance for international private equity flows and for cross-border syndication. Section 3 is devoted to a brief sketch of our data set, while a detailed description of the database and the definitions of our variables are supplemented in two appendices at the end of the paper. In Section 4, we analyze the determinants of the worldwide cross-border private equity flows and the impact of the physical distance in particular. Section 5 investigates the investor structure behind cross-border private equity deals, focusing on the question whether distance influences syndication between foreign (resp. inexperienced) and local (resp. veteran) investors. Section 6 summarizes the results and discusses some alternative explanations. Section 7 gives directions for further research on international private equity transactions, cross-border syndication and the impact of distance and transaction costs.

## **2 Background**

Our paper focuses on the role physical distance plays in international private equity investments. We first argue that distance between the investors and their investments increases transaction costs and discuss how this fact influences the magnitude of cross-border private equity flows. Then, we deal with the impact of distance on the syndication between local (resp. veteran) and foreign (resp. inexperienced) private equity investors.

## *2.1 Distance, transaction costs and cross-border private equity flows*

We argue that physical distance impacts both direct and indirect transaction costs and that both these types of costs are tremendously relevant for private equity investors. Direct physical transaction costs (such as e.g. travel costs) caused by long distances are important for this type of financing, because private equity investors require frequent in-person contact with the companies both before and after making their funding decision (e.g. Gorman and Sahlman 1989). While there probably is not much controversy that distant investors in general face higher direct transaction costs than local investors, the issue of indirect transaction costs remains heavily debated in the literature on different types of international capital flows. Are local investors better informed than the distant ones or are foreign investors those who are more “sophisticated”? Grinblatt and Keloharju (2000) demonstrate that portfolios of foreign (typically large institutional) investors outperform portfolios of domestic (typically private) investors in Finland. Froot *et al.* (2001) suggest that international investors are better able to predict returns than local ones. Froot and Ramadorai (2008) demonstrate that international investors possess better information about fundamentals. If these findings hold for private equity as well, the local investors’ advantage stemming from low direct transaction costs could be outweighed by their information disadvantage. Then, the resulting impact of physical distance on transaction costs would remain unclear.

However, things seem to behave differently from what has been described in the previous paragraph when the information about projects is soft. Several studies, dealing with various financial instruments, support a positive correlation between proximity and improved information production. Coval and Moskowitz (2001) show that information acquisition costs of mutual fund managers increase with distance. Malloy (2005) argues that proximity improves the accuracy of analysts’ forecasts. Butler (2008) demonstrates that investment banks with a local presence are better able to evaluate soft information about high-risk and non-rated bonds. Petersen and Rajan (2002) and Berger *et al.* (2005) find that being close to customers facilitates bank’s collection of soft information. Teo (2006) shows that hedge funds with a presence in their investment region outperform other hedge funds.

A critical aspect of private equity is the successful production of information about relatively opaque companies and the management of these investments (see e.g. Barry 1994, Gompers 1995, Ueda 2004), including negotiation and enforcement of complex contracts and monitoring of agents (e.g. Kaplan and Strömberg 2003). Moreover, besides the above mentioned information-related costs arising on the company level, foreign private equity investors have to adapt to the recipient country's institutional environment and to understand local market conditions (e.g. Bruton *et al.* 2005), which is easier on shorter distances. We claim that indirect transaction costs, arising from information gathering and processing and from the coordination among the participating parties, are increasing in distance. They reach their minimum for domestic investors, who are located nearby the companies, are familiar with local practices and market situation, have regional business experience, an improved access to "soft" information, to formal as well as informal networks and to deal flow (see e.g. Wright *et al.* 2005). As a result, information frictions in private equity industries are expected to be positively correlated with distance.

To sum up, physical distance increases direct transaction costs, which are relevant because of the necessity of frequent face to face contacts between private equity investors and their portfolio companies and of working together to solve problems. Distance also enhances indirect transaction costs, arising out of the soft character of the information environment for private equity investments. On this note, Cumming and Johan (2006) argue that, resulting from the specific features of this kind of financing, the "home bias" is more pronounced for private equity investors than for other types of financiers during all phases of their investment process. First, within the screening and selection phase it is less costly to screen close than distant companies. Second, during the investment phase, physical proximity makes information flow, monitoring and value-adding activities easier (see also Lerner 1995, Sorenson and Stuart 2001). Finally, proximity facilitates exiting (see also Jääskeläinen and Maula 2005). So, we expect the intensity of cross-border private equity flows between two countries to decrease in the physical distance between them.

One might argue that the largest investors, such as Carlyle Group, KKR, or Blackstone with expertise and offices in many local markets, are true multinationals who feel as domestic investors nearly everywhere around the world. For them, physical distance would not play any role. Even smaller

private equity financiers who have already invested in a country have, during their selection and investment process, gained experience and contacts there and sometimes have even established a local office. In the field of international business, several studies document an experience-gaining process through internationalization (see Barkema *et al.* 1996, Barkema and Vermeulen 1998). In the context of private equity, De Clercq and Dimov (2008) demonstrate that these investors gain knowledge from prior investments, helping them evaluate, select, and manage subsequent transactions. Therefore, we conjecture that after being present in a country for some time, distance from their home country becomes less relevant for private equity investors (Guillén 2003). Thus, additionally, we carry out our analysis focusing only on “newcomer transactions” and distinguish them from “veteran transactions”. The former are the first transactions done by investors in countries where they have never invested before. We conjecture that veteran investors are less concerned about distance than newcomer financiers.

Private equity investors’ costs to gather and process information about a company and the frequency of required face-to-face interactions with this company are not substantially different when the financier invests one million than when it invests ten million. Thus, small deals should more strongly be discouraged by long distances than large deals.

## *2.2 Distance and cross-border syndication*

In a next step, we take into consideration that private equity investors often cooperate. They tend to form investment syndicates, in which several financiers team up and jointly invest in one company. Theoretical literature has put forward several motives for syndication, the most important among them being risk diversification (Chowdhry and Nanda 1996, Wilson 1968) and information sharing (Millon and Thakor 1985, Sah and Stiglitz 1986, Casamatta and Haritchabalet 2007). As information may be shared within a syndicate, such joint participation of several investors reduces the information-related transaction costs of an average investor. When foreign private equity investors delegate the selection, monitoring, and management of the portfolio companies to their local partners<sup>2</sup> – who better know the local corporate culture, legal environment, industry structure and technological conditions –, the need

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<sup>2</sup> Such “delegated monitoring” has some parallels with the delegated monitoring modeled by Diamond (1984).



for their information gathering and processing decreases. Also, they do not need to visit the company as frequently as would be the case in the absence of locally present investors. To sum up, distant foreign (resp. newcomer) investors may prefer syndication to stand-alone deals because it is expensive for them to compete against better informed and favorably positioned local investors.

Two questions arise in this context. One might ask about the costs of such “delegated monitoring” and argue that the distant (resp. newcomer) private equity investor does not save much on transaction costs because, instead of controlling the portfolio firm, it would have to monitor its local (resp. veteran) partner. Thus, without an additional mechanism, delegated monitoring costs would not be lower than direct monitoring costs. However, reputational and reciprocity mechanisms are expected to diminish potential agency conflicts among the syndicate partners who stay in repeated relationships (e.g., Pichler and Wilhelm 2001, Chowdhry and Nanda 1996, Tykvová 2007). Another issue one might wonder about, are the incentives of local partners to make joint investments with distant investors who are, as we have argued, typically badly informed. There are at least two reasons for why it may pay to a local investor to take a foreigner on board. First, due to the above mentioned reciprocal nature of relationships in the private equity industry, such international syndication may help increase deal flow when local private equity investors become foreigners in the home countries of foreign investors they partnered with. Second, foreign private equity investors may be valuable to portfolio companies (and, hereby, to their local partner as well) because of their familiarity with capital and product markets in their home countries. In particular, portfolio companies planning an expansion into foreign markets profit from such cooperation (see Mäkelä and Maula 2006). In this paper, however, we only take the perspective of the foreign investor when examining cross-border syndication.

To sum up, we argue that syndication within private equity industries offers an additional advantage to those discussed in the literature so far. Syndication may reduce direct and information-related transaction costs of private equity investors arising from long distances. This is particularly relevant in the international context, when foreign private equity investors team up with local partners or when investors enter countries where they have never been present before and syndicate with investors who have experience in these countries. We hypothesize, on the one hand, that the attractiveness of syndication for the foreign (resp. newcomer) investor increases in physical distance from its

investment and, on the other hand, that physical distance becomes less deterrent when a deal is syndicated with a local (resp. veteran) financier.

Finally, we turn to the issue of fixed-cost character of transaction costs and conjecture that the distant (resp. newcomer) investor's need to search for a local (resp. veteran) syndication partner, which is rising in distance, increases at a lower pace as the deal volume rises.

### 3 Our data set

#### 3.1 Cross-border private equity flows

Data on worldwide private equity transactions used in this study originate from Bureau van Dijk's Zephyr database. In this section, we describe and motivate the construction of our dependent variables on both, the bilateral-country and the transaction level. Moreover, we offer some statistics on the size of private equity flows by source (= private equity investor) and recipient (= investment) countries and by continents.

Within the bilateral-country setting, we analyze the relationship between the physical distance and the intensity of private equity cross-border investments (i.e. transactions in which the investors do not invest in their home country) between country pairs. Our dependent variables are the number of cross-border transactions and their investment volume for each pair of source and recipient countries in each year. Besides this absolute measure of bilateral cross-border private equity activities, we use the ratio of bilateral cross-border on total (domestic plus cross-border) private equity transactions in a given country and year, as a robustness check. Our dataset consists of 30 countries<sup>3</sup> and seven years (2000-2006), resulting in 6,090 country-pair-year observations, which are the basis for our analyses on the aggregate *total* transaction level. More information about the Zephyr database and details on how we transformed it for our purposes can be found in Appendix 1.

As argued in Section 2, the physical distance between the headquarters of the private equity investor and its portfolio company in the local market may be irrelevant for investors with experience in the

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<sup>3</sup> The dataset includes the following countries: Australia, Austria, Belgium, Brazil, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Hong Kong, India, Ireland, Israel, Italy, Japan, Korea, the Netherlands, New Zealand, Norway, Poland, Portugal, the Russian Federation, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States (see Figure 1).

respective local market. Besides the variables number and volume of *total* cross-border transactions, we therefore generate two further measures, namely the number and the volume of *newcomer* transactions, consisting only of transactions of investors without experience in the country under focus. (Transactions of experienced and local investors are labeled *veteran* transactions.) This dataset covers 30 countries within the time period 2001-2006 and, thus, consists of 5,220 country-pair-year observations on the aggregate *newcomer* transaction level. More details can be obtained from Appendix 1.

For each source and each recipient country, Table 2 shows the number and volume of cross-border total and newcomer transactions. Moreover, the table depicts the number of country-pair-years without transactions (“zero pairs”). This table indicates that the cross-border investment activities vary substantially among countries: Some countries, such as the United States and the United Kingdom, are very successful in attracting foreign investors from many different countries, while others such as Brazil or New Zealand obtain foreign investments only from a few countries.

Obviously, *ceteris paribus*, large countries both attract and source more transactions than small countries. This issue raises a necessity to account for differences in country size, which varies substantially in our sample. Therefore, for the sake of our empirical analysis, we scale the number and volume of cross-border transactions by the root (by the logarithm as a robustness check) of the product of both populations.<sup>4</sup>

The data, from which we generate the above described bilateral-country figures, include 11,846 total cross-border transactions<sup>5</sup> in the period 2000–2006 (3,719 newcomer cross-border transactions in the period 2001–2006). To give a picture on the absolute and relative importance of intra and intercontinental private equity capital flows, Figure 1 depicts the number of these transactions and relates them to the number of domestic private equity transactions within this time period. The by far largest number (nearly 10,200 transactions) is the domestic transactions of American investors

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<sup>4</sup> Another alternative how to control for these differences would be a division of our dependent variables by the product (or the logarithm) of both GDP levels. However, we prefer to choose a division by population because this variable is strictly exogenous whereas the GDP level might be influenced by private equity activities (see Da Rin *et al.* 2006).

<sup>5</sup> When a deal is syndicated among several investors from more than one foreign country, we split this “deal” into several “transactions” in order to be able to assign this deal to all the countries where the foreign investors come from (see Appendix 1 for details).

(including U.S., Canada, and Brazil), being dominated by the U.S. Also domestic investments of European investors are sizeable (approximately 7,400 transactions). Moreover, we denote intensive cross-border activities within Europe with nearly 3,900 transactions. The bulk of intercontinental investments take place between Europe and the U.S. in both directions, with more than 2,500 transactions of European investors in the U.S. and nearly 2,300 transactions in the opposite direction.

At the transaction level, where we investigate the relationship between the distance and the likelihood of the syndication with domestic investors, our dependent variables are discrete. As already mentioned in the introduction, the share of domestically syndicated on total cross-border deals is impressive (see Table 1). More than 43% of cross-border deals are syndicated with local investors from the country of the investment, whereas 50% are stand-alone deals and only 7% are transactions carried out by foreign syndicates. In the first step, we use a binary variable that captures whether or not a cross-border deal is syndicated with local investors. In the second step of our analysis on the transaction level, we include also domestic deals (i.e. deals without a participation of a foreign investor) in our analysis. Here, our dependent variable takes one of three values: we distinguish between stand-alone deals (57% of all deals), syndication with a participation of a domestic investor (41%) and syndication among foreign investors (2%).

### *3.2 Explanatory and control variables*

Our main variable of interest is the physical distance between the source and the recipient country. In order to test its impact on bilateral-country cross-border private equity transactions, we control for the relative differences in the profitability of investment opportunities between the two countries because, *ceteris paribus*, these generate return differentials, which may be exploited by internationally active investors. One important factor is the growth rate difference between the recipient and the source country (see Focarelli and Pozzolo 2000, Goldberg 2005 in the banking context). We use the expected real growth rate for the next 3–5 years because this time period corresponds to the average investment horizon of private equity investors. We conjecture that private equity flows from low-growth into high-growth countries. Returns from private equity investments also depend on the legal and fiscal framework (e.g. Armour and Cumming 2006). We employ the difference in the shareholder rights

protection index and real corporate tax index between the recipient and the source country in our regressions. Moreover, we include the difference in the economic development of both countries and expect countries with low levels of GDP per capita having higher demand for external capital, and thus more likely to attract investors from more developed economies (e.g. Focarelli and Pozzolo 2000 in the banking context, Hochberg *et al.* 2006 in the private equity context).

Obviously, private equity in- and outflows as well as countries' syndication patterns should depend on the size of the local private equity industries. Concretely, the stronger the recipient countries' and/or the weaker the source countries' private equity industries are, the lower intensity of cross-border transactions we expect. Also, we assume less cross-border transactions to be carried out jointly with local investors in those countries where private equity industries are less developed for at least two reasons. First, it is more difficult to find a local partner when the supply of potential partners is low. Put differently, only in countries with mature private equity industries do foreign investors stand a high chance of finding an investor with whom they can form a cross-border syndicate. Second, the competition among private equity investors in these countries is presumably less pronounced than in countries with more developed private equity industries. Given this, syndication with local investors may be a preferable way how foreign investors reduce the pressure from competition and facilitate their market entry in countries with developed private equity industries (see Hochberg *et al.* 2006). So, we expect a stronger local private equity industry to push foreigners' syndication with local investors. For the analyses of total transactions, we consider the size of the local private equity industry whereas for the investigations of newcomer transactions, the number of veterans is relevant.

In order to avoid potential endogeneity problems with our regressors we employ lagged values for the time varying variables. (We use contemporaneous values as robustness check.) One exception is the expected real growth rate because this variable does not include expectations, but realized values.

At the transaction level, where we analyze the likelihood that a private equity deal is syndicated with a local investor, we are interested in the companies' age as a further reflector of transaction costs. Not only is it, as argued above, more difficult to gather and evaluate information about distant companies, it is also more costly to collect and process information about early stage ventures than about established companies with long track records (see e.g. Wright and Robbie 1998). Not only indirect,

but also direct transaction costs are presumably higher for young companies when compared to their established counterparts because the former, due to their low experience and higher agency costs, typically require more intensive and more frequent managerial involvement of the private equity investors than the latter.

Moreover, our attention is also paid to the impact of the deal size on syndication. First, the risk sharing motive behind syndication implies that the likelihood of syndication increases with deal volume (see Manigart *et al.* 2006). Second, deal volume helps us test whether distance plays more critical role in small than in large deals as suggested above. To do this exercise, we interact the deal volume with a distance variable.<sup>6</sup>

Appendix 2 provides definitions and sources of all variables used in the paper. Summary statistics of the explanatory and control variables are presented in Table 3.

#### ***4 Does distance discourage foreign private equity investors?***

In order to understand how transaction costs affect the geography of private equity investments, we analyze the impact of physical distance on the number and the volume of cross-border transactions (scaled by population) between each pair of our 30 recipient and source countries in each year. We end up with dependent variables which are zero for all country-pair-years without cross-border transactions and positive otherwise. To account for the fact that several country-pair-years have zero cross-border transactions, we use a one-side censored Tobit model. Since we construct one of our regressors (*PEsize*) on the basis of our main dataset, which starts in 2000, and since we use a lagged value of this variable throughout all regressions, our analyses of both total and newcomer transactions in this and the subsequent sections start in the year 2001.

As regressors we use the physical distance between the recipient and the source country, which is our main variable of interest, and several control variables, which we motivate in Section 3 and describe in Appendix 2 in more detail, that capture potential differences in profitable investment opportunities

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<sup>6</sup> Instead of using distance directly, we employ a dummy variable, which takes a value 0 if the distance is below its median value and 1 otherwise, to calculate the interaction term in order to reduce the immense correlation between the interaction term and the two variables it is based on.

between the recipient and the source country. We conjecture differences in the expected economic growth, in the shareholder protection and taxation spurring cross-border private equity flows from the countries with lower growth rates, less favorable shareholder protection and higher taxation towards faster growing economies as well as countries with sound fiscal and legal environments. Moreover, we expect less developed countries and countries with small local private equity industries to attract private equity from more developed economies and countries with strong private equity sectors.

We are aware of the fact that we cannot measure all characteristics of the source and recipient countries, such as the sophistication of their financial markets, competition within the local private equity industries or local companies' attitudes towards private equity financing, that may have an impact on cross-border activities and that may be correlated with one or more of our regressors. In order to account for this unobserved heterogeneity, we use the classical remedy, namely the inclusion of recipient and source country fixed effects in our regressions. In this way, we correct for country-specific characteristics and are less subject to criticism about an omitted variable bias or model specification. Moreover, we include year dummies to filter out time-varying unobservable impacts, such as the world market developments.

The results of our estimations are reported in Table 4. Physical distance between two countries has a large statistically and economically significant impact on the intensity of bilateral cross-border private equity transactions between these two countries. This finding demonstrates that large physical distances discourage private equity firms from investing. This outcome holds for both the total and the newcomer cross-border transactions, irrespectively of whether we look on the number or the volume of these transactions. These results suggest that local (resp. veteran) investors face lower direct and/or indirect transaction costs than distant (resp. newcomer) financiers.

With respect to our control variables, the difference in the expected growth rate between the recipient and the source country has a positive effect on the number and the volume of bilateral cross-border transactions, which is, however, statistically significant only for total but not for newcomer transactions. Differences in the shareholder rights protection, corporate taxation and size of the local private equity industries do not have any significant impact. GDP per capita difference has a

statistically significant negative effect, suggesting that private equity flows into countries, which are less developed than the private equity source economies.

In order to further investigate the impact of distance on cross-border private equity flows, we distinguish between small and large deals. In line with the above argumentation, we expect that small deals are more strongly affected than large ones. To deal with this issue, we run Tobit regressions using the same regressors as employed in Table 4 (with the number<sup>7</sup> of total and newcomer bilateral cross-border transactions as dependent variables) for the subsamples of small and large deals. We estimate both equations with help of the seemingly unrelated regression approach to account for a possible relation between them.

Table 5 depicts the results from our estimations for the subsamples of small (left part of the table) and large deals (right part of the table) for total (upper part of the table) and newcomer transactions (lower part of the table). Distance has a significant negative impact for both small and large subsamples in both total and newcomer estimations. However, the economic effect is in both cases higher in the subsample of small deals and this difference when compared to the subsample of large deals is in both cases statistically significant. This result is in line with our conjecture that physical distance discourages small deals more strongly than large deals.

We carry out a number of additional regressions in order to yield insights whether the results we have discussed so far are sensitive to various sources of changes. In particular, we perform the following robustness checks:

- (i) In order not to restrict the analysis to cross-border transactions only, but to account for the domestic private equity activities in the source and recipient countries as well, we use alternative measures of the intensity of bilateral cross-border private equity flows. Instead of the investigation of the absolute number and volume of private equity transactions between each pair of countries, we relate the bilateral cross-border transactions to all (domestic plus cross-border) transactions in the respective recipient or source country. For the reasons discussed above, we divide our measure by the population to account for the country size as we did in the main body of our analysis. Since

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<sup>7</sup> We only use the number of transactions but not their transaction volume here because our criterion for the distinction between small and large deals and, thus, the belonging to the respective subsample is based on the transaction volume.



we use a relative measure on the level of the recipient country (i.e. transactions from country  $i$  to country  $j$  related to all transactions in country  $j$ ), we only need to control for the size of the source country (i.e. country  $i$ ) when using the fraction based on the recipient country and vice versa.

(ii) Instead of using the root we use the logarithm of the product of both populations to scale the number and volume of bilateral cross-border transactions because we want to check that our results are not driven by our scaling procedure (and the logarithm is often used in similar contexts).

(iii) In a next step, we ignore the potential endogeneity problem and, instead of lagged values, use contemporary values for our control variables, because the latter may be more relevant for private equity investors' decisions.

(iv) One could be concerned that our results are driven by a single country. Therefore, we re-run each of our regressions 30-times excluding one country at a time from the sample.

(v) Moreover, we test whether the simultaneous exclusion of the two largest and most important private equity markets, the United States and the United Kingdom, from our sample changes our findings.

(vi) Given that our variable of interest – distance – does not change over time, we estimate the models using time averaged variables.

The common result from all our robustness checks is that the impact of distance remains unchanged. Without any(!) single exception, the coefficient of this variable remains always economically and statistically significant.. Moreover, the difference between the subsamples of small and large deals is in nearly all cases largely statistically and economically significant. These outcomes strongly confirm our key findings from the basis specifications that distance matters and that it matters more for small than for large deals. We lack space to show the results of these robustness checks at their full length. However, the details can be obtained from the authors.

## 5 *Is syndication helpful in overcoming the hurdle of long distances?*

After having identified physical distance as a crucial hindering factor for cross-border private equity flows, we want to answer the question whether syndication with domestic (resp. veteran) partners helps foreign (resp. newcomer) private equity investors overcome this hurdle. So far, we have focused on cross-border transactions as a uniform sample and have ignored the fact that 43 percent of these deals are not pure cross-border (i.e. all investors are foreigners) but rather “mixed” deals. In these “mixed” deals, which we call domestically syndicated deals, foreign and domestic (resp. newcomer and veteran) investors team up.

In this section we look into the differences between domestically syndicated and pure cross-border total (resp. newcomer) deals and conjecture that the presence of a local (resp. veteran) investor in an international syndicate may bring about easier selection, monitoring and advising of the portfolio company, a greater familiarity with local market conditions and a deeper understanding of the country’s legal framework. The first part of our analysis in Section 5 is carried out on a bilateral-country level (Section 5.1), whereas in the second and third parts (Sections 5.2 and 5.3) we move to the disaggregated level of single transactions, where we are able to control for various company, deal, and investor characteristics.

### *5.1 Domestically syndicated vs. pure cross-border transactions (bilateral-country level)*

In the first step, we divide each of our two (total and newcomer) bilateral-country samples into two subsamples: (i) domestically syndicated (CBDD) and (ii) pure (CBA) cross-border transactions. We hypothesize that distance plays a larger role for pure than for domestically syndicated cross-border transactions because in the latter, foreign (resp. newcomer) private equity investors’ transaction costs arising from long distances will typically be reduced through the involvement of a local (resp. veteran) partner. To examine whether domestically syndicated and pure cross-border transactions react differently on distance, we run bilateral-country Tobit regressions in a seemingly unrelated regression framework for the subsamples of domestically syndicated and pure cross-border transactions.

The outcome of this exercise is depicted in Table 6. Distance has a negative effect in both subsamples (domestically syndicated and pure cross-border deals), irrespectively of the type of the dependent variable employed (total or newcomer transactions, number or volume). The negative impact of

distance on the intensity of cross-border private equity flows is always higher within the subsample of pure compared to domestically syndicated deals as hypothesized; this difference being significant in three out of our four models. These results confirm our expectations that the negative impact of physical distance between the foreign (resp. newcomer) investor and the target company decreases when deals are syndicated with local investors from the recipient country (resp. with veteran investors).

Two further results are worth mentioning. First, the impact of the difference in the size of the local private equity industry between the recipient and the source country is statistically significant only for the subsample of domestically syndicated deals (in three out of four cases) but never for pure cross-border transactions, suggesting that the development of local private equity industries affects the syndication patterns. Plausibly, countries with strong private equity industries seem to attract domestically syndicated but not pure cross-border private equity deals. A relatively high supply of local private equity investors may increase the chances to find a partner. In addition, it might be difficult for a foreign investor to enter countries with strong and established private equity industries. Syndication may be a way how to gain access to these markets (see Hochberg *et al.* 2006). The difference between the two subsamples, however, is statistically significant for the number of cross-border private equity transactions, but not for their volume.

Second, another interesting finding is the impact of the growth difference on bilateral cross-border transactions, which is statistically significant (in all cases) for domestically syndicated, but not for pure cross-border transactions. This finding perfectly fits with our story that syndication reduces transaction costs: the lower transaction costs in domestically syndicated deals enable foreign investors to exploit growth differences between countries. The difference between the domestically syndicated and pure cross-border transactions is statistically significant for the number of cross-border private equity transactions, but not for volume.

The heterogeneity of the investor structure within our category of pure cross-border syndicates is an important issue that must be addressed. Imagine two investors from the Netherlands, who both invest in Canada. The first one invests alone whereas the second one syndicates with a partner from the U.S. In the above analysis, both these cases belong to our category of pure cross-border transactions.

Obviously, the latter deal, where the Dutch financier invests together with a U.S. partner, would typically resemble a domestically syndicated cross-border deal type because the U.S. private equity partner has low direct and probably also indirect transaction costs in Canada. The U.S. investor would most probably reduce the Dutch partner's transaction costs because it is located nearby the company and likely has contacts and experience in Canada. Therefore, as a robustness check, we compare only stand-alone (instead of all pure) and domestically syndicated cross-border transactions. However, the results (not reported but available upon request) are very similar to those presented above. We turn to this issue in the following sections, in which we will deal with the disaggregated level of single transactions, in more detail.

Besides the exercise mentioned in the previous paragraph, we perform the same robustness checks as in Section 4: (i) We employ ratios instead of absolute numbers, (ii) we scale the dependent variables with the logarithm of the product of both populations instead with the root of it, (iii) we use contemporary instead of lagged values, (iv) we leave out one country at a time, (v) we exclude of the United States and the United Kingdom simultaneously, and, finally, (vi) we use the between estimation. Our findings (not reported) with respect to the differing role of distance in the two subsamples are broadly confirmed in all these analyses.

## *5.2. Likelihood of syndication between domestic and foreign investors (transaction level)*

Private equity investors' heterogeneity (with respect to their size, age, human capital endowment, know-how, and, in particular, cumulated experience in the country under focus) remains an important issue for the investment decision, which we have ignored so far. Also, being on the aggregate bilateral-country level, we have not been able to address the differences in deal and companies' characteristics, such as the transaction volume, companies' age or industry. Therefore, an analysis on a transaction level, which is able to account for at least some of these heterogeneities, can generate further insights into the role distance plays for cross-border private equity flows and syndication patterns.

In this section we estimate the likelihood that a cross-border transaction is domestically syndicated, i.e. whether or not a foreign (resp. newcomer) investor relies on a local (resp. veteran) partner. The

dependent variable is, thus, binary. A value of 1 is attributed if the transaction is domestically syndicated and 0 otherwise.

Concerning the impact of transaction costs on the likelihood of syndication between a foreign (resp. newcomer) and a domestic (resp. veteran) investor, we include not only distance, but also an additional measure, which captures the transaction costs, namely the company age. We employ a very rich set of controls for the investor, country, time, deal and target company characteristics. We do not include macroeconomic variables because we do not model the private equity investor's choice in which country to invest. Rather, we analyze its decision whether to syndicate with local investors, given a cross-border deal. Hereby, we take the view of the most distant investor. As one of our robustness checks we consider the perspective of the nearest investor (remember our example from the previous section of the Dutch investor investing in Canada with a U.S. partner; in this case the know-how and the location of the nearest – the U.S. – investor will be the key factor for the decision whether to syndicate with a local Canadian partner or not).

Since we do not have much information on the above discussed characteristics of each single private equity investor and the time dimension of the database is too short to be able to deliver the useful information (e.g. on investors' experience, but also on interactions between investors and the role of reciprocity and repeated relationships in the international context), we prefer to include a dummy for each of these investors in order to control for the heterogeneities among them. However, with a very large number (several thousands) of private equity investors, this strategy is not realizable. But we can use a conditional logit specification, which provides a semi-parametric estimation of the logit model without need to estimate the individual investor fixed effects (see Chamberlain 1980). Further, we take into account country and time specific effects by including recipient country and year dummies in our regressions. We further control for company and deal characteristics in that we, besides company age, include industry dummies and deal volume. We also control for the size of the local private equity industry, which is expected to influence syndication behavior.

When analyzing newcomer transactions, we decided not to include private equity investor fixed effects for two reasons. First, the number of newcomers is low. Second, this low number of observations would further be substantially reduced when private equity investor fixed effects would be included

because more than a half of the newcomers only have just one deal. Therefore, we prefer to use a simple logit model (with standard errors clustered on the level of the private equity investors). In this setting, additionally to variables discussed above, we include source country dummies, which we were not able to employ in the regressions with total transactions due to the inclusion of investors' fixed effects there.

Our results on total and newcomer transactions are depicted in Table 7. The outcomes with respect to the impact of physical distance match our expectations. Far-away located (resp. newcomer) investors tend to syndicate their deals with local (resp. veteran) partners. So, once more, syndication with local (resp. veteran) partners is a device used by foreign investors (resp. newcomers) to save on transaction costs arising from long distances. Transactions with older targets, which are less opaque and where the need for soft information production and frequent in-person contacts is presumably lower than in the case of immature companies, are rather pure cross-border than domestically syndicated transactions. Yet again, this finding perfectly fits in our world of local (resp. veteran) investors having lower direct transaction costs and access to soft information whereas this access is restrained, or at least expensive, to foreign (resp. newcomer) investors. Larger deals tend to be syndicated with domestic investors (total, but not newcomer transactions), which probably reflects the diversification motive of private equity investors. Once again, the likelihood of foreigners' syndication with local private equity investors increases, when the relative availability of potential local partners is high.

In Models 2 and 4 of Table 7, we add an interaction term of distance and deal volume. The role of this term is to check for the possible fixed-cost character of transaction costs. We suggest that distance should play a less important role when deals are large. This is exactly what we observe for total transactions, where we find a significant negative impact of the interaction term, whereas other results stay by and large unaffected. For newcomer transactions, the impacts of deal volume and the interaction term remain insignificant.

As already mentioned, we take the perspective of the nearest instead of the furthest investor as a robustness check. Moreover, as in previous sections, we exclude one country at a time. Finally, we carry out our analyses without investors and targets from the United States and the United Kingdom.

Our main results remain confirmed, albeit some of them lack statistical significance when excluding the United States and the United Kingdom from the sample. Details can be obtained from the authors.

### *5.3. Likelihood of syndication with domestic vs. foreign investors (transaction level)*

In the final step, we also include domestic deals and model the likelihood that a transaction is syndicated with a domestic (resp. veteran) investor or with a foreign (resp. newcomer) investor, using stand-alone deals as a base category. Distinguishing between different types of syndication and stand-alone transactions this approach allows a more accurate analysis of syndication motives than the previous section. Again, we take the perspective of the most distant investor (which may be a domestic, resp. a veteran, investor as well, in which case the distance equals zero) and examine its decision to syndicate with less distant investors (or investors at a same distance), distinguishing between domestic (resp. veteran) and foreign (resp. newcomer) investors. We expect that distant investors would be more prone to syndicate.

We use a multinomial logit model with the base category “stand-alone deals” and two further categories – deals syndicated with a domestic (resp. veteran) investor and deals syndicated with a foreign (resp. newcomer) investor. As in the previous section, besides our main variable of interest (distance) we employ company characteristics (age, industry), deal volume and the level of the local private equity industry development in the recipient country as regressors. Moreover, we control for the source and recipient country characteristics and time specific factors using the respective dummies. Standard errors are clustered at the level of the recipient country. The inclusion of domestic deals in the analyses does not allow us to employ our interaction term because – due to the zero distance of the vast majority of our deals (all domestic, resp. veteran, deals) – this term is very strongly correlated with distance.

The results of our regressions for the total and newcomer transactions are depicted in Table 8. The likelihood of both types of syndication is increasing in distance, reflecting the distant (resp. newcomer) investors’ needs to involve better located and better informed partners. The positive sign of the coefficients on the deal volume (in three out of four cases statistically significant) may point toward the risk sharing motive. More stand-alone deals with older target companies may be a sign of lower needs for information and risk sharing among investors along with more transparent companies.

The development of the local private equity industry in the recipient country influences positively syndication with local investors, but not syndication with foreign investors (which is not influenced or even negatively influenced in the case of newcomer transactions), being in line in what we have found in previous sections.

As robustness checks, we exclude one country at a time and, additionally, estimate the regressions without investors and targets from the United States and the United Kingdom. Our main results (not reported) remain unaffected. However, the significance levels drop in some cases.

## ***6 Summary of the main results and the demand side of the coin***

We see our paper as one of the first analyses in the field of internationalization within the private equity industries. Furthermore, we employ a new dataset on private equity investments around the globe. Therefore, a substantial part of this paper is devoted to the sketch of the dataset's contents and to a rather descriptive analysis of international private equity flows. On the bilateral-country level, we look at how distance affects cross-border international private equity flows and syndication. Obviously, a lot of interesting and relevant questions cannot be answered at this level and require a more detailed analysis. Therefore, this step is followed by an investigation at a transaction level, which helps gain additional insights on the impact of distance on private equity investors' behavior. This exercise perfectly confirms our results from the bilateral-country level analysis and, above this, generates some useful hints on the role of deal and company characteristics for cross-border syndication.

We argue that physical distance increases direct and indirect transaction costs. We document that distance discourages cross-border private equity flows, being more relevant for small than for large deals. Whereas the impact of transaction costs (and distance in particular) has been shown in the literature on different types of international capital flows, the evidence on their role for cross-border private equity transactions has been lacking. Moreover, we demonstrate that syndication with local (resp. experienced) investors may help reduce transaction costs arising from long distances between foreign investors and their investees. The transaction costs' reduction is an additional benefit from syndication, which has not explicitly been discussed in the literature so far.



One limitation of our approach is that we take the view of the foreign private equity investor and consider its motives for investments and for syndication. However, one might oppose that it is not only the (foreign) investor who looks for a company to invest in, but that also companies might be searching for (foreign) investors. In addition, local investors might seek international partners for their local investments. Companies and local investors may have several motives for such behavior. Cross-border syndication can create an additional value in the portfolio firms and, thus, generate higher returns to investors because various types of investors' experience are bundled in an international syndicate. Cross-border syndicates may combine more complementary skills and capabilities than domestic syndicates. For instance, they may play a key role in the internationalization efforts of their portfolio firms, which may profit from the private equity investors' knowledge of their respective home country product and capital markets. Due to the reciprocal nature of relationships in the private equity industry, cross-border syndication might increase deal flow and international diversification of local private equity investors when they become foreigners in the home countries of foreign investors they partnered with. Cross-border syndicates may invest in the most promising countries at a relatively low cost.

The alternative explanations given above do not contradict our conjectures and findings based on the supply side of cross-border private equity. Rather, they do not offer much insight into the impact of distance on the intensity of international private equity flows and cross-border syndication. Taking the view of local investors and companies (the demand for foreign private equity), one would expect that, *ceteris paribus*, they prefer nearby located investors to distant investors because the former better understand the local market, its institutional setting, etc., and, therefore, are more valuable. Thus, we expect that the rising geographical distance discourages private equity demand in the same way as it reduces the private equity supply. It also seems plausible that, for the same reason, the companies' wish to have a local investor is more intensive when the foreign investor is very far. The reason why we have based our argumentation on the supply side is that the private equity industry is much more supply than demand driven (e.g. Gompers and Lerner 2000, Hand 2003, Da Rin et al. 2006). However, our results are also consistent with the demand-side of the coin.

## **7 Further research**

Our discussion of cross-border private equity investments raises a couple of further research questions. First, there are several further possible drivers for syndication between foreign and local investors, which we do not analyze and which were described in the previous section. Future research could look into the motives of all participants in cross-border syndicates, namely that of domestic investors and of portfolio companies and also take a more dynamic approach.

Second, syndication between foreign and domestic investors seems to be particularly pronounced in recipient countries with strong private equity industries. Future research could look into the issue of how local private equity industries' development, size and structure impact cross-border investments and syndication patterns in more detail. Networking at a local and at an international level may be a way how to mitigate competition and hinder the market entrance.

Third, in this paper, we investigate the impact of local private equity investors on the reduction of foreigners' transaction costs arising from long distances. However, cross-border syndication is only one avenue. One could imagine that local lawyers, accountants, investment bankers and strategy consultants may substitute local syndication partners. Another possibilities how foreigners might reduce their transaction costs from distant transactions could be the opening of an own local office or a subsidiary with local employees, forming a joint venture with a local investor ("long-term" syndication), investment into local funds instead into companies directly ("funds-of-funds") or employment of investment managers with a background from the destination country, etc. A very challenging task for future research remains to examine the determinants of the choice of the entrance strategy or a combination of them.

Our dataset offers the huge advantage of a very broad scope with many deals included. However, the time dimension is rather short and the dataset does not contain much additional information on deal, company and private equity investors' characteristics. Thus, our paper helps gain first insights into the internationalization and cross-border syndication within private equity industries around the globe. However, the analysis of the issues outlined above requires a very rich and detailed set of data, which must, to a large part, be hand-collected.

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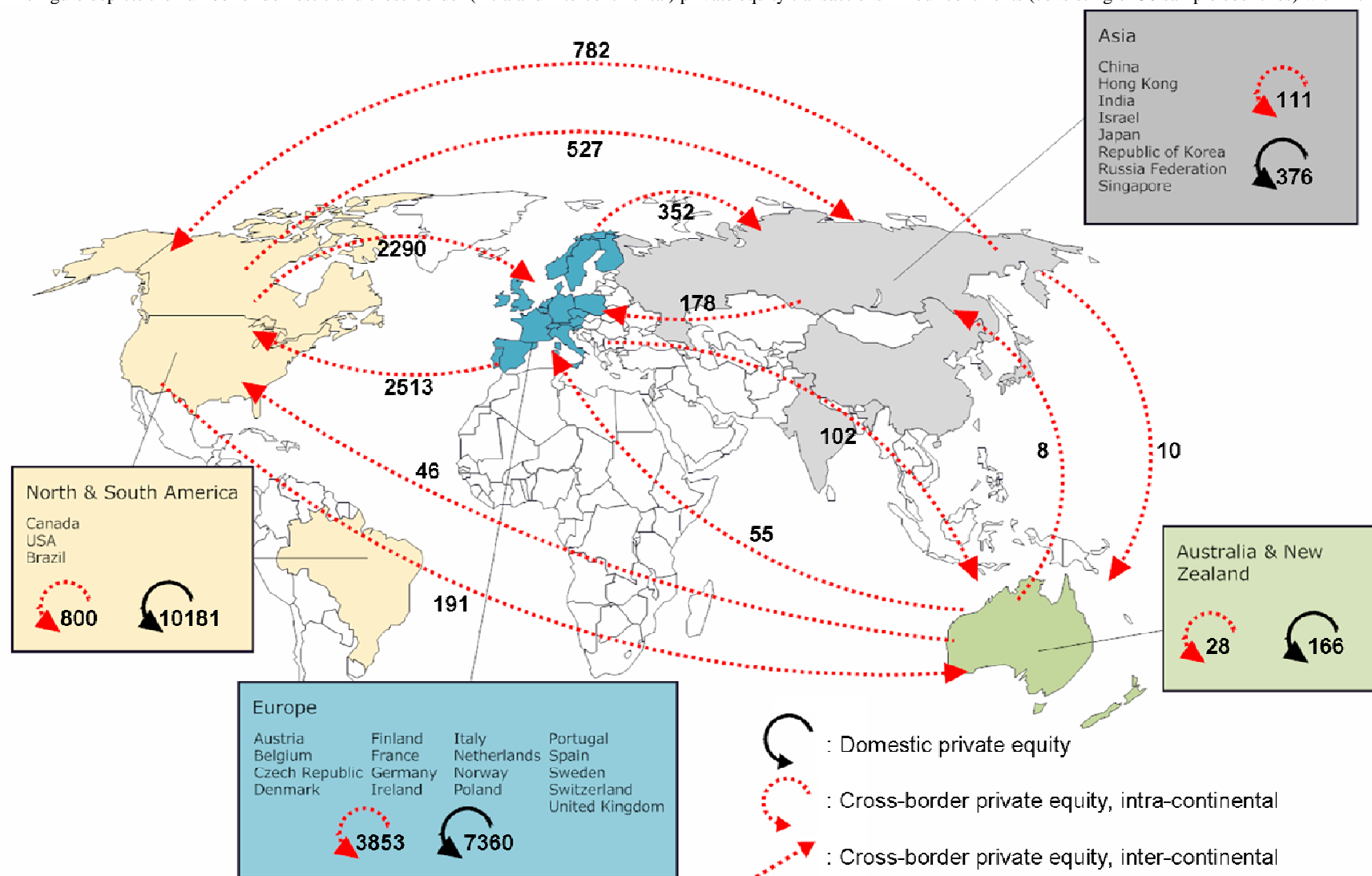
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*Figure 1: Number of domestic and cross-border (intracontinental and intercontinental) transactions in the sample countries*

This figure depicts the number of domestic and cross-border (intra and intercontinental) private equity transactions in four continents (consisting of 30 sample countries) within the period 2000-2006.



*Table 1: Volume and number of deals financed by private equity, internationalization and syndication shares*

This table gives information on private equity deals in 30 sample countries within the period 2000-2006. The first three columns depict the volume and the number of all deals and the average deal volume in each recipient country. The fourth and fifth columns give information on the share of syndicated and cross-border deals on all deals. The next column informs on syndication rates of cross-border deals and, finally, the last columns depict the fraction of deals in which domestic and foreign investors form a syndicate on syndicated cross-border deals.

recipient country	All deals (domestic and cross-border) 28089 deals					Only cross-border deals 9920 deals	Only syndicated cross-border deals 4962 deals
	volume (bn EUR)*	number	avg. deal vol. (mn EUR)*	share of synd.**	share of cross-border**	share of syndicated**	share of domestically syndicated**
AUSTRALIA	9.97	436	35.60	0.11	0.68	0.08	0.70
AUSTRIA	0.96	160	14.49	0.29	0.41	0.41	0.70
BELGIUM	7.03	360	32.83	0.32	0.44	0.47	0.81
BRAZIL	1.27	41	60.65	0.05	0.66	0.04	0.00
CANADA	23.70	1247	22.15	0.33	0.35	0.48	0.82
CHINA	5.74	250	28.85	0.26	0.66	0.37	0.48
CZECH REPUBLIC	2.48	44	99.18	0.20	0.61	0.33	0.67
DENMARK	5.68	314	29.41	0.39	0.43	0.51	0.87
FINLAND	5.93	398	38.47	0.28	0.44	0.34	0.78
FRANCE	78.30	2120	54.36	0.42	0.34	0.50	0.87
GERMANY	67.40	1289	113.55	0.33	0.44	0.45	0.82
HONGKONG	1.39	28	53.58	0.25	0.82	0.30	0.14
INDIA	6.70	256	33.18	0.19	0.74	0.20	0.34
IRELAND	5.95	252	30.19	0.48	0.61	0.53	0.79
ISRAEL	5.63	431	14.52	0.63	0.63	0.71	0.86
ITALY	25.30	594	100.44	0.15	0.47	0.19	0.75
JAPAN	16.80	144	168.17	0.24	0.42	0.39	0.46
KOREA	3.30	39	96.92	0.18	0.82	0.19	0.33
NETHERLANDS	44.30	525	228.19	0.22	0.39	0.38	0.71
NEW ZEALAND	2.04	49	65.82	0.10	0.47	0.22	0.80
NORWAY	5.20	198	35.16	0.22	0.52	0.28	0.59
POLAND	0.93	82	19.40	0.12	0.67	0.16	0.11
PORTUGAL	1.77	102	32.21	0.14	0.45	0.24	0.64
RUSSIAN FED.	2.72	97	47.78	0.08	0.63	0.11	0.14
SINGAPORE	0.72	60	15.94	0.13	0.67	0.20	0.63
SPAIN	22.80	813	42.65	0.20	0.27	0.25	0.74
SWEDEN	17.60	859	33.48	0.26	0.36	0.46	0.87
SWITZERLAND	6.83	204	57.85	0.43	0.73	0.51	0.69
UNITED KINGDOM	146.00	4403	56.58	0.23	0.45	0.27	0.82
UNITED STATES	445.00	12294	45.45	0.61	0.24	0.84	0.95
<b>A L L</b>	<b>969.43</b>	<b>28089</b>	<b>49.51</b>	<b>0.43</b>	<b>0.35</b>	<b>0.50</b>	<b>0.87</b>

\* based only on approx. 80% of the deals, for which the information about deal volume is available. \*\* based on number of deals



*Table 2: Cross-border total and newcomer transactions, by source and recipient country*

This table depicts the number and volume of total (resp. newcomer) cross-border transactions for the time period 2000-2006 (resp. 2001-2006) for each source country (Panel a) and each recipient country (Panel b). The figures in the column “Zero pairs” indicate the number of country-pair-years, in which we do not observe any bilateral cross-border transactions.

**Panel a - Source country**

	Total transactions (2000 – 2006)			Newcomer transactions (2001 – 2006)		
	Number	Volume (bn EUR)	Zero pairs	Number	Volume (bn EUR)	Zero pairs
<b>Source country</b>						
AUSTRALIA	123	22.41	165	61	4.67	145
AUSTRIA	21	0.65	190	13	0.48	165
BELGIUM	283	15.73	137	92	11.59	136
BRAZIL	1	0.05	202	1	0.05	173
CANADA	480	9.26	158	141	3.73	142
CHINA	22	0.32	192	18	0.31	163
CZECH REPUBLIC	3	0.26	201	3	0.26	172
DENMARK	131	1.14	155	55	0.73	143
FINLAND	148	1.30	158	38	0.46	150
FRANCE	552	14.90	112	180	7.43	106
GERMANY	1476	53.07	62	244	5.48	89
HONGKONG	71	3.59	178	57	3.42	154
INDIA	14	0.24	194	8	0.21	168
IRELAND	58	0.70	189	16	0.46	164
ISRAEL	306	1.85	177	76	0.36	156
ITALY	98	2.88	163	36	2.44	150
JAPAN	525	4.99	129	114	0.79	123
KOREA	20	0.07	192	17	0.06	165
NETHERLANDS	601	13.52	86	175	4.12	101
NEW ZEALAND	14	0.56	194	4	0.02	170
NORWAY	95	0.64	164	43	0.33	152
POLAND	3	0.01	200	3	0.01	171
PORTUGAL	14	0.49	192	10	0.20	166
RUSSIAN FEDERATION	8	0.23	195	7	0.23	167
SINGAPORE	115	1.36	165	52	1.04	144
SPAIN	84	3.45	167	43	2.55	149
SWEDEN	301	13.42	129	90	4.30	123
SWITZERLAND	651	11.68	103	192	3.23	103
UNITED KINGDOM	2301	108.73	44	644	39.21	48
UNITED STATES	3327	199.40	18	1286	75.81	18
<b>A L L</b>	<b>11846</b>	<b>486.90</b>	<b>4611</b>	<b>3719</b>	<b>173.97</b>	<b>4176</b>

Table 2 – cont.

**Panel b - Recipient country**

	Total transactions (2000 – 2006)			Newcomer transactions (2001 – 2006)		
	Number	Volume (bn EUR)	Zero pairs	Number	Volume (bn EUR)	Zero pairs
<b>Recipient country</b>						
AUSTRALIA	307	8.48	161	83	2.87	150
AUSTRIA	82	1.21	173	47	0.49	150
BELGIUM	202	5.52	151	105	3.33	135
BRAZIL	27	1.21	193	19	0.81	165
CANADA	504	13.13	143	300	8.52	130
CHINA	191	2.94	161	133	1.80	134
CZECH REPUBLIC	28	2.74	184	20	2.33	160
DENMARK	172	5.25	149	79	2.74	141
FINLAND	214	8.05	149	77	3.78	137
FRANCE	880	42.64	113	251	14.43	114
GERMANY	743	68.60	117	273	20.78	110
HONGKONG	31	1.20	180	27	1.20	154
INDIA	201	6.03	167	116	3.46	147
IRELAND	188	6.17	165	77	5.18	152
ISRAEL	355	3.01	138	157	1.55	134
ITALY	298	29.39	150	107	9.62	137
JAPAN	72	8.47	184	36	5.11	157
KOREA	35	2.91	183	26	2.24	158
NETHERLANDS	257	43.18	137	137	25.55	125
NEW ZEALAND	24	2.03	196	20	1.43	167
NORWAY	115	5.10	163	72	3.16	141
POLAND	58	2.07	176	22	1.01	157
PORTUGAL	50	1.13	176	31	0.55	158
RUSSIAN FEDERATION	69	5.24	172	34	2.15	155
SINGAPORE	44	0.61	182	29	0.39	159
SPAIN	243	15.88	154	87	5.21	147
SWEDEN	378	11.33	131	141	5.52	129
SWITZERLAND	223	7.63	138	112	4.19	129
UNITED KINGDOM	2245	124.92	74	414	19.10	86
UNITED STATES	3610	50.81	51	687	15.49	58
<b>A L L</b>	<b>11846</b>	<b>486.90</b>	<b>4611</b>	<b>3719</b>	<b>173.97</b>	<b>4176</b>

*Table 3: Descriptive statistics on the explanatory and control variables*

This table gives descriptive statistics for the explanatory and control variables based on the aggregate level of recipient countries (Panel a) and on the disaggregated level of single transactions (Panel b) for the time period 2000-2006. For data definitions and sources see Appendix 2.

	Mean	Standard deviation	Minimum	Maximum
<b>Panel a</b>				
<b>COUNTRY LEVEL</b>				
distance	8.31	1.11	5.15	9.88
growthe	3.20	1.39	0.20	8.00
GDPcap	24.51	9.40	2.31	42.86
rights	6.82	1.30	2.86	8.90
tax	5.27	1.47	1.40	8.95
PEsize	0.26	0.25	0.00	1.13
<b>Panel b</b>				
<b>TRANSACTION LEVEL</b>				
dealvolume	9.53	1.43	2.53	16.29
age	1.81	1.11	0.00	5.61

*Table 4: Bilateral-country level – Number and volume of cross-border transactions, whole sample*

This table reports the coefficients and the marginal effects (for the unconditional expected value) of left-censored Tobit estimations. The linear part of the model is as follows:  $CB_{ijt} = \beta'x_{ijt} + u_{ijt}$ , with  $x_{ijt} = (1, distance_{ij}, D\_PEsize_{ijt-1}, D\_growthe_{ijt}, D\_tax_{ijt-1}, D\_rights_{ijt-1}, D\_GDPcap_{ijt-1}, dummies)$ . Year, source and recipient country dummies are included. White-heteroscedasticity-consistent z-values are given in parentheses. \*\*\*, \*\*, \* denote significance at the 1, 5, and 10 percent level. Censoring value is 0. For data definitions and sources see Appendix 2.

	Number of bilateral cross-border transactions				Volume of bilateral cross-border transactions			
	Model 1: Total transactions		Model 2: Newcomer transactions		Model 3: Total transactions		Model 4: Newcomer transactions	
	coefficient	marginal effect	coefficient	marginal effect	coefficient	marginal effect	coefficient	marginal effect
distance <sub>ij</sub>	-0.0175*** (-15.50)	-0.0014	-0.0093*** (-11.84)	-0.0007	-0.0996*** (-8.40)	-0.0078	-0.0544*** (-9.18)	-0.0039
D_PESize <sub>ijt-1</sub>	8.3005 (1.64)	0.6645	2.8246 (1.10)	0.2257	36.3448 (1.13)	2.8570	13.839 (0.93)	0.9822
D_growthe <sub>ijt</sub>	0.0017** (2.12)	0.0001	0.0006 (1.04)	0.0000	0.0131** (2.03)	0.0010	0.0055 (1.30)	0.0004
D_tax <sub>ijt-1</sub>	-0.5282 (-0.66)	-0.0423	0.0753 (0.15)	0.006	-5.1695 (-0.76)	-0.4064	-0.4659 (-0.11)	-0.0331
D_rights <sub>ijt-1</sub>	0.1056 (0.11)	0.0085	0.3941 (0.68)	0.0315	-0.596 (-0.08)	-0.0469	0.3979 (0.08)	0.0282
D_GDPcap <sub>ijt-1</sub>	-1.8354*** (-3.73)	-0.1469	-1.2647*** (-4.32)	-0.1011	-13.4004*** (-3.79)	-1.0534	-9.6401*** (-3.94)	-0.6842
source country dummies	yes		yes		yes		yes	
recipient country dummies	yes		yes		yes		yes	
year dummies	yes		yes		yes		yes	
$\chi^2$	746.9536		772.7321		233.7952		171.0049	
Number of obs. (country-pair-years)	5220		5220		5220		5220	
Number of censored obs. (country-pair-years)	3944		4176		3944		4176	

*Table 5: Bilateral-country level – Number of cross-border transactions, small vs. large*

This table reports the coefficients and the marginal effects (for the unconditional expected value) of left-censored Tobit estimations for the subsamples of small and large deals. The upper panel of the table depicts the results for the category of total transactions, the lower panel for newcomer transactions. The linear part of the Tobit model is as follows:

$CB_{ijt} = \beta'x_{ijt} + u_{ijt}$ , with  $x_{ijt} = (1, distance_{ij}, D\_PEsize_{ijt-1}, D\_growthe_{ijt}, D\_tax_{ijt-1}, D\_rights_{ijt-1}, D\_GDPcap_{ijt-1}, dummies)$ . Year, source and recipient country dummies are included. The small and large deals regressions are estimated jointly with help of the SUR approach. z-values are given in parentheses. Last column depicts the value of the  $\chi^2$ -statistics on the equality of the coefficients from the small-deals and large-deals subsample (Chow-Test). \*\*\*, \*\*, \* denote significance at the 1, 5, and 10 percent level. Censoring value is 0. For data definitions and sources see Appendix 2.

	Model 1: Total transactions				Chow-Test
	Subsample 1: Small deals (CBS)		Subsample 2: Large deals (CBL)		
	coefficient	marginal effect	coefficient	marginal effect	
distance <sub>ij</sub>	-0.0106*** (-13.34)	-0.00024	-0.0070*** (-13.51)	-0.00013	18.26***
D_PEsiz <sub>ijt-1</sub>	6.1809 (1.54)	0.13738	1.7653 (0.70)	0.03165	1.06
D_growthe <sub>ijt</sub>	0.0018*** (-2.83)	0.00004	0.0007 (1.56)	0.00001	2.25
D_tax <sub>ijt-1</sub>	-0.2584 (-0.42)	-0.00574	0.1038 (0.23)	0.00186	0.29
D_rights <sub>ijt-1</sub>	0.2555 (0.34)	0.00568	0.2444 (0.48)	0.00438	0.00
D_GDPcap <sub>ijt-1</sub>	-0.9532*** (-2.74)	-0.02119	-1.3734*** (-4.92)	-0.02462	1.24
source country dummies	yes		yes		
recipient country dummies	yes		yes		
year dummies	yes		yes		
Number of obs. (country-pair-years)	5220		5220		
Number of censored obs. (country-pair-years)	4369		4368		
	Model 2: Newcomer transactions				Chow-Test
	Subsample 1: Small deals (CBS)		Subsample 2: Large deals (CBL)		
	coefficient	marginal effect	coefficient	marginal effect	
distance <sub>ij</sub>	-0.0063*** (-9.31)	-0.00013	-0.0050*** (-10.17)	-0.00010	3.01*
D_PEsiz <sub>ijt-1</sub>	0.4139 (0.18)	0.00827	0.0933 (0.06)	0.00191	0.01
D_growthe <sub>ijt</sub>	0.0013*** (2.64)	0.00003	0.0005 (-1.20)	0.00001	1.71
D_tax <sub>ijt-1</sub>	0.6682 (1.31)	0.01335	-0.0506 (-0.13)	-0.00104	1.41
D_rights <sub>ijt-1</sub>	0.5683 (0.93)	0.01135	0.1103 (0.25)	0.00226	0.42
D_GDPcap <sub>ijt-1</sub>	-0.8259*** (-3.04)	-0.01650	-1.1539*** (-4.76)	-0.02368	1.03
source country dummies	yes		yes		
recipient country dummies	yes		yes		
year dummies	yes		yes		
Number of obs. (country-pair-years)	5220		5220		
Number of censored obs. (country-pair-years)	4588		4569		

**Table 6: Bilateral-country level – Number and volume of cross-border transactions, synd. vs. pure**

This table reports the coefficients and the marginal effects (for the unconditional expected value) of left-censored Tobit estimations for the subsamples of domestically syndicated and pure cross-border transactions. Panel a depicts the results for the number of transactions, panel b for the transaction volume. The linear part of the model is as follows:

$CB_{ijt} = \beta'x_{ijt} + u_{ijt}$ , with  $x_{ijt} = (1, \text{distance}_{ij}, D\_PEsize_{ijt-1}, D\_growthe_{ijt}, D\_tax_{ijt-1}, D\_rights_{ijt-1}, D\_GDPcap_{ijt-1}, \text{dummies})$ . Year, source and recipient country dummies are included. The CBDD and CBA regressions are estimated jointly with help of SUR approach. z-values are given in parentheses. Last column depicts the value of the  $\chi^2$ -statistics on the equality of the coefficients from the CBDD and CBA subsample (Chow-Test). \*\*\*, \*\*, \* denote significance at the 1, 5, and 10 percent level. Censoring value is 0. For data definitions and sources see Appendix 2.

Panel a: Number of bilateral cross-border transactions					
	Model 1: Total transactions				Chow-Test
	Subsample 1: Dom. syndicated cross-border transactions (CBDD)		Subsample 2: Pure cross-border transactions (CBA)		
	coefficient	marginal effect	coefficient	marginal effect	
distance <sub>ij</sub>	-0.0059*** (-8.48)	-0.000074	-0.0088*** (-9.40)	-0.000645	7.80***
D_PESize <sub>ijt-1</sub>	9.7816** (2.27)	0.123264	2.0865 (0.48)	0.153452	2.96*
D_growthe <sub>ijt</sub>	0.0032*** (4.20)	0.000041	0.0007 (0.91)	0.00005	7.67***
D_tax <sub>ijt-1</sub>	0.6416 (0.84)	0.008085	-0.7246 (-0.95)	-0.053291	2.06
D_rights <sub>ijt-1</sub>	0.5317 (0.58)	0.0067	0.1905 (0.21)	0.014012	0.09
D_GDPcap <sub>ijt-1</sub>	0.2238 (0.59)	0.00282	-1.4806*** (-3.54)	-0.108893	13.25***
source country dummies	yes		yes		
recipient country dummies	yes		yes		
year dummies	yes		yes		
Number of obs. (country-pair-years)	5220		5220		
Number of censored obs. (country-pair-years)	4393		4236		
	Model 2: Newcomer transactions				Chow-Test
	Subsample 1: Dom. syndicated cross-border transactions (CBDD)		Subsample 2: Pure cross-border transactions (CBA)		
	coefficient	marginal effect	coefficient	marginal effect	
distance <sub>ij</sub>	-0.0039*** (-7.92)	-0.000058	-0.0049*** (-8.22)	-0.000307	2.30
D_PESize <sub>ijt-1</sub>	5.8026* (1.81)	0.086802	-2.0091 (-0.64)	-0.126379	5.10**
D_growthe <sub>ijt</sub>	0.0017*** (3.13)	0.000025	-0.0004 (-0.90)	-0.000028	10.61***
D_tax <sub>ijt-1</sub>	0.2014 (0.40)	0.003013	0.1012 (0.21)	0.006367	0.02
D_rights <sub>ijt-1</sub>	-0.3698 (-0.65)	-0.005531	0.6674 (1.15)	0.041979	2.08
D_GDPcap <sub>ijt-1</sub>	-0.6458*** (-2.81)	-0.00966	-0.7479*** (-3.34)	-0.047043	0.14
source country dummies	yes		yes		
recipient country dummies	yes		yes		
year dummies	yes		yes		
Number of obs. (country-pair-years)	5220		5220		
Number of censored obs. (country-pair-years)	4554		4495		

Table 6 – cont.

Panel b: Volume of bilateral cross-border transactions					
	Model 3: Total transactions				Chow-Test
	Subsample 1: Dom. syndicated cross-border transactions (CBDD)		Subsample 2: Pure cross-border transactions (CBA)		
	coefficient	marginal effect	coefficient	marginal effect	
distance <sub>ij</sub>	-0.0069*** (-5.75)	-0.000103	-0.0700*** (-6.77)	-0.004658	37.79***
D_PEsiz <sub>ijt-1</sub>	9.7649* (1.84)	0.144665	2.3659 (0.06)	0.157516	0.03
D_growthe <sub>ijt</sub>	0.0036*** (3.33)	0.000053	0.0084 (1.07)	0.000557	0.38
D_tax <sub>ijt-1</sub>	-0.9766 (-0.82)	-0.014468	-3.8079 (-0.45)	-0.25352	0.11
D_rights <sub>ijt-1</sub>	-0.0949 (-0.08)	-0.001406	-1.1032 (-0.11)	-0.07345	0.01
D_GDPcap <sub>ijt-1</sub>	-0.7041 (-1.43)	-0.010432	-15.8802*** (-3.99)	-1.057259	15.15***
source country dummies	yes		yes		
recipient country dummies	yes		yes		
year dummies	yes		yes		
Number of obs. (country-pair-years)	5220		5220		
Number of censored obs. (country-pair-years)	4393		4236		
Model 4: Newcomer transactions					
	Model 4: Newcomer transactions				Chow-Test
	Subsample 1: Dom. syndicated cross-border transactions (CBDD)		Subsample 2: Pure cross-border transactions (CBA)		
	coefficient	marginal effect	coefficient	marginal effect	
distance <sub>ij</sub>	-0.0075*** (-5.53)	-0.000105	-0.0371*** (-6.58)	-0.002027	28.72***
D_PEsiz <sub>ijt-1</sub>	9.7979 (1.31)	0.137484	-6.6159 (-0.22)	-0.361112	0.31
D_growthe <sub>ijt</sub>	0.0037*** (2.61)	0.000051	-0.0015 (-0.27)	-0.000082	0.89
D_tax <sub>ijt-1</sub>	-1.7095 (-1.16)	-0.023988	1.6347 (0.29)	0.089224	0.36
D_rights <sub>ijt-1</sub>	-1.8526 (-1.16)	-0.025996	2.9036 (0.44)	0.158487	0.54
D_GDPcap <sub>ijt-1</sub>	-2.0314*** (-3.39)	-0.028504	-9.7649*** (-3.50)	-0.532988	7.96***
source country dummies	yes		yes		
recipient country dummies	yes		yes		
year dummies	yes		yes		
Number of obs. (country-pair-years)	5220		5220		
Number of censored obs. (country-pair-years)	4554		4495		

**Table 7: Transaction level – Likelihood of a domestically syndicated cross-border deal**

This table depicts the results from the logit model with a dependent binary variable domestically syndicated

cross-border deal ( $cbd_k$ ). The model form is:  $p_k = \frac{e^{\beta'x_k}}{\sum_k e^{\beta'x_k}}$ , with  $x_k = (distance_{ij}, D\_PEsize_{ijt-1}, age_k,$

$dealvolume_k, distance_{ij} \times dealvolume_k, dummies)$ . Year, industry and country dummies are included. In Panel a we employ a conditional logit model with investor fixed effects. In Panel b we use a standard logit model with standard errors clustered on the investor level. For the calculation of distance and investor fixed effects, we take the perspective of the most distant investor. z-values are given in parentheses. \*\*\*, \*\*, \* denote significance at the 1, 5, and 10 percent level. For data definitions and sources see Appendix 2.

<b>Panel a: Total transactions</b>				
	<b>Model 1</b>		<b>Model 2</b>	
	coefficient	marginal effect	coefficient	marginal effect
distance <sub>ij</sub>	0.2382*** (2.65)	0.0249	0.4696*** (4.17)	0.0117
D_PEsizes <sub>ijt-1</sub>	2.0133*** (4.28)	0.2109	1.9963*** (4.22)	0.0496
age <sub>k</sub>	-0.2350*** (-2.97)	-0.0246	-0.2411*** (-3.05)	-0.006
dealvolume <sub>k</sub>	0.1152** (2.20)	0.0121	0.1581*** (2.93)	0.0039
distance <sub>ij</sub> X dealvolume <sub>k</sub>			-0.0944*** (-3.50)	-0.0023
recipient country dummies	yes		yes	
year dummies	yes		yes	
industry dummies	yes		yes	
Private equity investor fixed effects	yes		yes	
$\chi^2$	325.9327		338.3288	
Number of observations (transactions)	2222		2222	
<b>Panel b: Newcomer transactions</b>				
	<b>Model 3</b>		<b>Model 4</b>	
	coefficient	marginal effect	coefficient	marginal effect
distance <sub>ij</sub>	0.2319*** (2.77)	0.0562	0.2246*** (2.65)	0.0544
D_PEsizes <sub>ijt-1</sub>	1.1742*** (3.38)	0.2845	1.1998*** (3.42)	0.2907
age <sub>k</sub>	-0.0187*** (-2.77)	-0.0045	-0.0183*** (-2.69)	-0.0044
dealvolume <sub>k</sub>	0.0000 (0.06)	0.0000	-0.0000 (-0.57)	0.0000
distance <sub>ij</sub> X dealvolume <sub>k</sub>			0.0000 (0.84)	0.0000
source country dummies	yes		yes	
recipient country dummies	yes		yes	
year dummies	yes		yes	
industry dummies	yes		yes	
$\chi^2$	336.0341		338.9678	
Number of observations (transactions)	1634		1634	



**Table 8: Transaction level – Likelihood of syndication with domestic vs. foreign investors**

This table depicts the results from the multinomial logit model with a dependent variable  $syn_k$ . The underlying

model is:  $\Pr(syn_k = m) = e^{\beta_m' x_k} / \sum_{l=1}^3 e^{\beta_l' x_k}$ ,  $m = 1, 2, 3$ , with  $x_k = (distance_{ij}, D\_PEsize_{ijt-1}, age_k, dealvolume_k,$

$dummies)$ .  $syn_k$  takes the value 1 when the deal is stand-alone (base outcome), 2 when the deal is syndicated with domestic investors and 3 when a deal is syndicated among foreign investors only. Year, industry and country dummies are included. Standard errors are clustered on the recipient country level. z-values are given in parentheses. Hausman test denies the violation of independence of irrelevant alternatives. \*\*\*, \*\*, \* denote significance at the 1, 5, and 10 percent level. For data definitions and sources see Appendix 2.

<b>Panel a: Total transactions</b>				
	Group 2: synd. with domestic		Group 3: synd. among foreign	
	coefficient	marginal effect	coefficient	marginal effect
distance <sub>ij</sub>	0.0779*** (4.02)	0.0047	0.5125*** (10.07)	0.0003
D_PEsiz <sub>ijt-1</sub>	2.4427** (2.18)	0.6040	-0.2980 (-0.40)	-0.0011
age <sub>k</sub>	-0.5126*** (-10.10)	-0.1266	-0.5237*** (-5.57)	-0.0002
dealvolume <sub>k</sub>	0.1900*** (3.35)	0.0469	0.2371*** (3.03)	0.0001
source country dummies	yes		yes	
recipient country dummies	yes		yes	
year dummies	yes		yes	
industry dummies	yes		yes	

Base category

Stand-alone deals

Number of observations  
(transactions)

9202

<b>Panel b: Newcomer transactions</b>				
	Group 2: synd. with domestic		Group 3: synd. among foreign	
	coefficient	marginal effect	coefficient	marginal effect
distance <sub>ij</sub>	0.0403*** (2.82)	0.0022	0.4030*** (8.69)	0.0135
D_PEsiz <sub>ijt-1</sub>	1.8738** (2.21)	0.5019	-1.8140** (-2.26)	-0.1007
age <sub>k</sub>	-0.3985*** (-8.36)	-0.0927	-0.3334*** (-2.70)	-0.0040
dealvolume <sub>k</sub>	0.1824*** (3.32)	0.0434	0.1037 (0.77)	0.0001
source country dummies	yes		yes	
recipient country dummies	yes		yes	
year dummies	yes		yes	
industry dummies	yes		yes	

Base category

Stand-alone deals

Number of observations  
(transactions)

9202

### ***Appendix 1: Information about the Zephyr database and the generation of our dependent variables***

Data on cross-border private equity investments stem from the *Zephyr* database, provided by the *Bureau van Dijk Electronic Publishing*. This platform initially aimed at M&A transactions, but also conveys data on IPOs and private equity deals. Recently, the existence of this database has started to be registered by researchers working in the field of private equity (e.g. Goosens *et al.* 2007, Abdesselam *et al.* 2005). The huge advantage of *Zephyr* database is its very broad scope, including all countries round the globe. Also middle-sized deals are covered relatively well. However, a disadvantage lies in the very short time-horizon. The database has started in 1997. In the first years it had a strong European and M&A focus. Therefore, we begin our analysis in year 2000. We consider the period 2000-2006 and have collected information on worldwide individual deals of private equity investors within this period, in particular on the physical locations of the investors and their investments.

For each deal, besides the names of the target company and all investors, Bureau van Dijk's *Zephyr* database contains a wide range of information on the participating parties, such as their countries of origin, parent companies, business descriptions or US SIC codes. Moreover, a unique identification number is assigned to each investor and to each company. At the transaction level, the date of the deal, deal type and, in approximately 80 percent of the cases, also the deal volume is available. For the sake of the bilateral-country level analysis, we have approximated the missing deal volume with an average deal volume in the respective recipient country. (For the investigations at the transaction level, deals without information on their volume have been excluded.) Moreover, the investment volumes are only reported for a deal as a whole. So, in syndicated deals, we do not know how much each single private equity investor invested. We have assigned an equal investment sum to each of the participating investors in this case.

We have classified the private equity deals from the *Zephyr* database using several criteria. In the first step, we have searched the database for deals which had one of the following types of financing: venture capital, private equity, angel investment, corporate venturing, or seed financing. In the second step, we have analyzed the business description of the investors and kept only those deals in which the business description of at least one investor included "venture capital" or "private equity". The nature

of this dataset has raised the need of intensive reorganization. We will describe its main steps in the next few paragraphs.

We have excluded all deals that have been classified as share buy-back operations, IPOs, demergers, etc. As targets, we have kept only non-financial corporations in our sample. We have filled missing company (investor) information from other deals, when the company (investor) identification number has been identical. Deals with multiple targets have been split into separate observations. We have deleted all deals for which investors' names and countries and/or companies name and country have been missing as well as those that have been recorded for "wealthy individuals", "institutional investors" or other non-identifiable investors (without identification number). We have also excluded all deals where the company and its investor have been identical and for which no third party has been involved. This procedure has been aimed to reduce potential bias to reorganizations among private equity investors to a large extent. Moreover, we have achieved a consistent pattern by adjusting transaction dates to the European format.

The next step has required more sophistication because we have got closer to the organizational structure. In some cases, the identity of the investor in Zephyr is indicated on the level of the private equity fund, in other cases on the level of the private equity company. Also, in case of non-independent companies, sometimes the parent company whereas in other cases the subsidiary is indicated to be the investor. To achieve a consistent pattern, we have collected the data on the "highest" level using the information on ultimate parent companies offered by Zephyr. In order to be classified as a private equity investor for our analysis, either the subsidiary or the parent company has to be a private equity investor.

However, a noteworthy characteristic of the dataset is that parent company information in Zephyr is updated regularly, so that – relying only on the information indicated in the field "parent company" – we have not been able to trace back changes in the organizational structure. What is the drawback from this feature? Let investor A take over a share in target Z on January 1<sup>st</sup> 2004. If a different enterprise B took over investor A on January 1<sup>st</sup> 2003, we would attribute the above mentioned transaction to B, because B became A's parent before the transaction had been conducted. However, if B took over A on January 1<sup>st</sup> 2005, the above indicated transaction is carried out by A, because at the

date of the transaction, A and B are independent. But – using the parent information offered by Zephyr – we would falsely assign this transaction to B because B is indicated as A’s parent. To correct this “mistake”, for all our investors we have checked (within the Zephyr database) whether they have been acquired or merged during the period under observation. All transactions before a potential acquisition or merger date (in the latter example January 1<sup>st</sup> 2005) have been assigned to the original investor, all transactions after this date to its parent company.

After having finished these transformations, we have constructed our aggregate *total* transaction measures (number of bilateral cross-border transactions and volume of bilateral cross-border transactions between each pair of countries) in the following way: If one or more private equity investors from France provide capital to a company in Germany, this transaction shows up once in the cross-border transactions between France as the source country and Germany as the recipient country. If a private equity investor from France and a private equity investor from the United Kingdom provide capital to a firm in Germany, this deal counts once for the transactions between France and Germany but also once for the transactions between the United Kingdom and Germany. For such internationally syndicated deals, we have divided the investment volume by the number of private equity investors involved in the deal in order to be able to assign a volume figure to each participating country. In the above mentioned example, the deal volume has equally been divided between United Kingdom-to-Germany-transactions and France-to-Germany-transactions.

Private equity investors may have accumulated experience in the recipient country even if they are not a local investor in this country. 3i Group, as an example, is located in the United Kingdom and invests all over Europe, North America and Asia, having established subsidiaries or opened local offices in many countries. 3i Group formed a management unit in Germany, for example, as early as in 1986. In the Zephyr database, 3i Group investments in Germany are specified as transactions from the United Kingdom. However, we would expect that, because of its long experience and local presence, 3i Group’s direct and indirect transaction costs will be substantially lower than those of another foreign investor who invests in Germany for the first time. Rather, due to its experience and local presence, 3i Group feels as domestic investor in Germany.

For this reason, we have generated a category of *newcomer* cross-border transactions. Only transactions carried out by private equity investors during their first year of presence in the given recipient country belong to this category. All other transactions (i.e. transactions of local investors and those investors who have at least one year experience in a given country) count as veteran transactions. Thus, our classification of newcomer transactions is based on the non-existence of prior private equity investors' transactions in the country under focus because, unfortunately, we do not have data on the existence of local offices or subsidiaries and the date of their establishment for all investors and all countries from our sample. To give an example, none of the 3i Group transactions in Germany from our dataset counts as a newcomer cross-border transaction. Rather, for all these transactions, 3i Group is not a newcomer, but a veteran investor. Because of this procedure nearly two thirds of our *total* cross-border transactions can be found in the category of *veteran* transactions when analyzing *newcomer* cross-border transactions. To be able to distinguish between veterans and newcomers, we have needed historical data. For this reason, our sample of newcomer transactions must cover a shorter time period (2001-2006) than our sample of total transactions and, thus, consists only of 5,220 country-pair-year observations on the aggregate level.

## Appendix 2: Data description and sources

### Dependent variables

Bilateral-country level:

- CB<sub>ijt</sub>** denotes the number or volume of total or newcomer bilateral cross-border private equity transactions from country *i* to country *j* in year *t* calculated from individual deal data (*source: Bureau van Dijk's Zephyr database*). The number of cross-border transactions is multiplied by  $100,000/(\text{pop}_{\text{DC}} \cdot \text{pop}_{\text{SC}})^{0.5}$ , where pop denotes the population (*source: OECD Statistical Compendium 2005*), DC denotes the recipient country and SC the source country. The volume of cross-border transactions (in EUR) is multiplied by  $100/(\text{pop}_{\text{DC}} \cdot \text{pop}_{\text{SC}})^{0.5}$ .
- CBS<sub>ijt</sub>** is a subsample of CB<sub>ijt</sub> that includes only small deals (deal volume below the median).
- CBL<sub>ijt</sub>** is a subsample of CB<sub>ijt</sub> that includes only large deals (deal volume above the median).
- CBDD<sub>ijt</sub>** is a subsample of CB<sub>ijt</sub> that includes only those transactions that are syndicated with domestic investors from country *j*.
- CBA<sub>ijt</sub>** is a subsample of CB<sub>ijt</sub> that includes only those transactions that are not syndicated with domestic investors from country *j*.

Transaction level:

- cbd<sub>k</sub>** is a binary variable (1/0) indicating whether or not cross-border deal *k* is syndicated with domestic investors.
- syn<sub>k</sub>** takes the value 1 when deal *k* (domestic or cross-border) is stand-alone, 2 when deal *k* is syndicated with domestic investors and 3 when deal *k* is syndicated among foreign investors only.

### Explanatory and control variables

Bilateral-country level:

- distance<sub>ij</sub>** denotes the logarithm of the distance between the main city of the recipient (*j*) and the source country (*i*) in kilometers. In most cases (except Australia, Brazil, Canada, Germany, and the U.S.), the main city is the capital of the country (*source: www.cepii.fr*).
- growthe<sub>i</sub>** denotes the *i*'s country expected real GDP growth rate (in percent) for the next 3-5 years (*source: Datastream*).
- rights<sub>i</sub>** denotes an index of the implementation of the shareholders' rights in country *i* (*source: IMD World Competitiveness Yearbook (various issues)*). Higher value is better.
- tax<sub>i</sub>** denotes an index of real corporate taxes in country *i* (*source: IMD World Competitiveness Yearbook (various issues)*). Higher value is better.
- PEsize<sub>i</sub>** denotes the relative size of the *i*'s country private equity industry. For the analyses of total (resp. newcomer) transactions the size is measured as the number of domestic (resp. all) investors with at least one local deal in the given year (*source: Bureau van Dijk's Zephyr database*) multiplied by  $100,000/\text{pop}$ , where pop denotes the population (*source: OECD Statistical Compendium 2005*).
- GDPcap<sub>i</sub>** denotes the GDP per capita in country *i*, in USD at purchasing power parity (*source: IMD World Competitiveness Yearbook (various issues)*).
- D<sub>Xijt</sub>** denotes the difference in variable *X* between the recipient (*j*) and the source country (*i*) in year *t*.
- D<sub>Xijt-1</sub>** denotes the one-year lagged difference in variable *X* between the recipient (*j*) and the source country (*i*), divided by 1000.

Transaction level:

- age<sub>k</sub>** denotes the logarithm of the company's age at the deal date (*source: various Bureau van Dijk's databases*).
- dealvolume<sub>k</sub>** denotes the logarithm of the deal volume in th. EUR (*source: Bureau van Dijk's Zephyr database*).
- distance<sub>ij</sub> X**
- dealvolume<sub>k</sub>** interaction term: denotes the logarithm of the deal volume in th. EUR interacted with a dummy variable, which takes a value 0 if the distance is below its median and 1 otherwise.