

Stay at Home or Go Abroad?
The Impact of Fiscal and Legal Environments
on the Geography of Private Equity Flows

Andrea Schertler (Kiel University)*

Tereza Tykvová (ZEW Mannheim)

Abstract:

Using a unique European country dataset from 2000-2006, this paper analyzes how fiscal and legal environments impact the geography of private equity investments. We expect that an improvement in the intermediaries' fiscal environment will cause a shift in the supply curve. This shift will increase domestic investments, generate a positive return differential between foreign and domestic investments, and thus encourage private equity investors to go abroad. Our results confirm these predictions and suggest that investors systematically exploit cross-country differences in fiscal environments. As to the legal environment, we expect an improvement to shift both the domestic supply and the demand curve. These shifts will increase domestic investments, and depending on their relative magnitude, may generate either a positive or a negative return differential. Our results indicate that countries with a favorable legal environment have a higher level of domestic investment and also attract a higher amount of private equity from abroad.

Keywords: Private Equity, Internationalization, Fiscal and Legal Environment, Europe.

JEL Classification: F21, G24.

*Corresponding author: Andrea Schertler, Lehrstuhl für Finanzwirtschaft, Christian-Albrechts-Universität, Westring 425, 24118 Kiel, Germany. Phone: +49/431/880-4748. Email: a.schertler@bwl.uni-kiel.de.

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1 Introduction

One can hardly deny the importance of cross-border transactions in European private equity industries (e.g. Bottazzi et al. 2004). In our unique country dataset from 2000-2006, European cross-border private equity flows amounted to €79 billion and 1,300 transactions, while almost €85 billion were invested in 5,800 domestic transactions (see Table 1). However, the share of cross-border to total transactions varies substantially among European countries. For example, private equity investors located in the United Kingdom and Sweden expend much more money abroad than what they invest at home, while investors located in France and Ireland spend much more money in domestic portfolio companies than in foreign companies. This paper puts geography of Europe's private equity investments in the perspective of its countries' fiscal and legal environments.

Testable empirical predictions regarding the impact of these environments on domestic and cross-border private equity transactions stem from a simple supply-demand framework. In closed economies, an improvement in either the fiscal or the legal environment increases the quantity of private equity finance in equilibrium. In open economies, investors base their behavior on the differential in the risk-adjusted expected rate of return (i.e. price of private equity finance) at home and abroad. An improved fiscal environment for private equity intermediation in one's home country, e.g. via a tax transparent fund structure, results in a higher private equity supply, and thus in a negative return differential which encourages investors to go abroad. A sound legal environment in the investors' home country, however, implies both a higher supply and demand. When the effect on the demand side is more pronounced than the one on the supply side, returns increase, inducing investors to stay at home.

Our analysis, which is based on fifteen European countries in seven years, shows how different fiscal and legal environments affect private equity investors' domestic as well as cross-border transactions and internationalization shares. The main findings from our study can be summed up as follows. Favorable fiscal and legal environments trigger domestic deals. A sound fiscal environment for private equity intermediation, on the one hand, spurs investors to go abroad. On the other hand, a sound legal environment, on the contrary, stipulates them to stay at home. This evidence suggests that the legal environment is more closely related to the private equity demand than to supply. Our estimation results indicate that investors systematically exploit cross-country differences in fiscal environments and are robust to several alternative variable as well as model specifications.

The unique dataset we use to investigate these issues is created using the Bureau van Dijk's ZEPHYR database, which contains information about private equity investors' domestic deals, bilateral cross-border flows and internationalization shares. Because the ZEPHYR database provides information on the locations of the target companies and their private equity investors, but not on the geography of fund raising, the internationalization dimension we focus on is the private equity investors' foreign transactions, but not the foreign fund raising (e.g. Cumming and Johan (2007a), (2007b), Groh et al. (2008) on the latter issue). Moreover, the dataset does not enable a distinction between direct investments and setting up subsidiaries or branches abroad, which is an issue

comprehensively discussed for banks' foreign asset holdings (e.g. Cerutti et al. 2007, Herrero and Pería 2007).

Our research adds to the findings of some recent studies that analyze how fiscal and legal environments influence private equity investors' domestic behavior. Studies dealing with the fiscal environment have particularly explored the role of capital gains taxation on venture capital activities (a sub-asset class of private equity), but have paid less attention to the impact of the specific fiscal environment pertinent to private equity intermediation. For example, Da Rin et al. (2006) find that the capital gains tax rate negatively impact country-level venture capital investments in Europe; Gompers and Lerner (1998) report a negative effect of the federal capital gains tax rate on state level venture capital investments in the United States. A study by Armour and Cumming (2006) comes closest to addressing the role of the specific environment pertinent to private equity intermediation. However, they use a single indicator which combines the favorability of the fiscal and legal environments related to the demand and supply. Within a European country-level dataset they find an improvement in this indicator to increase the fundraising of private equity investors. Our empirical analysis does not only provide evidence on how the taxation of capital gains as well as the intermediaries' fiscal environment impact domestic activities, but also on how cross-border transactions and therefore investors' geographical decisions are affected.

Persuant to the seminal work of La Porta et al. (1997, 1998), a wide range of literature demonstrates a systematic relationship between a country's legal environment and the development of its financial system in general and its domestic private equity activity in particular. Recent research shows that the legal framework impacts the valuations and returns (Cumming and Walz 2004), the quality of support that the private equity investors offer their portfolio companies (Bottazzi et al. 2005), as well as the structure of private equity contracts and deal characteristics (Lerner and Schoar 2004). Cumming et al. (2006) demonstrate that good laws are able to produce more efficient project screening and faster deal origination. Moreover, only a few studies focus on the relationship between the legal environment and the internationalization. Recent literature finds evidence that in some cases foreign investors may take along a part of their legal environment to portfolio companies located in countries with an inferior environment (Kelley and Woidtke 2006, Allayannis et al. 2005, Rossi and Volpin 2004). Concerning private equity industries, Lerner and Schoar (2005) demonstrate that the choice of securities used depends on the legal system. Kaplan et al. (2003) demonstrate that when investing abroad, deal contracts of private equity investors located in civil law countries differ significantly from those investors located in common law countries. Finally, Guler and Guillén (2005) document that U.S. private equity investors' cross-border activities increase according to the quality of the destination countries' political institutions. Altogether, our analysis offers several new insights into how the legal environment impacts private equity investors' geographical decisions.

The remainder of the paper is organized as follows. Section 2 discusses the impact of fiscal and legal environments on the geography of investments. In Section 3, the dataset is described. Section 4 contains an analysis of whether European domestic private equity transactions are encouraged by favorable fiscal and legal environments. Section 5 is dedicated to the investigation of cross-border

flows on a bilateral country-pair basis. The aim is to figure out whether and how differences in the fiscal and legal environments impact cross-border transactions. In Section 6, we will focus on internationalization shares which combine private equity investors' domestic and cross-border transactions in a single figure. Section 7 summarizes the results of our investigations and concludes.

2 Empirical predictions

We will begin this section by making empirical predictions on how fiscal and legal environments affect private equity transactions within a simple supply-demand framework of a closed economy. In a further step, we augment this framework to a two-country setting and determine how cross-country differences in the fiscal and legal environments impact investors' geographical decisions.

Domestic private equity investments (DD)

Assume a closed economy in which the private equity demand results from companies' needs to finance investment projects with positive net present values. When the risk-adjusted expected return (hereafter referred to as return R) increases, companies demand a lower quantity of private equity finance (Q) because fewer projects with positive net present values can be identified. Therefore, in an R - Q -diagram, the demand curve (D) slopes downward.

The supply curve results from the willingness of initial investors, such as pension funds and insurance companies, to invest in this asset class, as well as from capacities available in the country to set up and to manage private equity funds. We identify two reasons for an upward-sloping supply curve. First, if initial investors' capital gains are subject to non-unique tax rates, the return increases in quantity since higher-taxed investors only provide capital for private equity funds if they are compensated with a higher return (Gompers and Lerner 1998). Second, because managers need particular expertise to identify and structure promising deals, and because building up such expertise is costly and requires time, the availability of qualified managers in the short-run only increases if the return rises. Therefore, we expect the supply curve (S) to slope upwards in an R - Q -diagram. This supply-demand framework is our tool to derive empirical predictions.

We begin by discussing how the position of the supply curve (and therefore the return and the quantity in equilibrium) is affected by fiscal rules pertinent to private equity funds and their managers in the case of other taxes being absent. Since fiscal rules that affect funds on the one hand and their managers on the other have similar effects on the private equity supply, we combine them into the "intermediaries' fiscal environment" in country i (F_i). Concerning funds, the availability of a transparent fund structure plays a decisive role because a tax on funds' income increases the required return and lowers the quantity supplied. As to managers, taxes on management fees and carried interest are relevant due to the fact that they impact the managers' incentives to select, monitor and support the portfolio companies. If a transparent fund structure is introduced or if taxes on management fees and carried interest are reduced, private equity investors demand a lower return. Therefore, an improvement in the intermediaries' fiscal environment is expected to shift the supply curve downward.

Panel a (left picture) in Figure 1 depicts this situation. Initially, when the funds' income, management fees and carried interest are subject to taxation, the supply curve is given by S_0 . In equilibrium, given the demand curve D_0 , the quantity equals Q_0 and the pre-tax return equals $R_{0,BT}$, resulting in a post-tax return of $R_{0,AT}$ ($R_{0,BT} > R_{0,AT}$). Removing taxes on funds' income, carried interest and management fees shifts the supply curve to S_1 , because investors demand a lower pre-tax compensation. Thus, an improvement in the intermediaries' fiscal environment increases the quantity of private equity finance in equilibrium.

So far, we have restricted our focus to intermediaries' level and have ignored taxes which are to be paid by initial investors on capital gains, on the one hand, and by portfolio firms' on income, on the other hand. Irrespective of whether initial investors' capital gains are subject to non-unique tax rates, higher rates shift the supply curve upwards and thus reduce the quantity in equilibrium. In the context of venture capital, Poterba (1989) shows within a theoretical model that the capital gains tax rate moves the demand curve as well because it impacts the decision to become an entrepreneur. Such an effect might also hold for private equity investments. Either way, an increase in the capital gains tax rate reduces domestic investments by shifting the supply or demand curve. Corporate income taxes, which may hinder entrepreneurial activities, may not affect the private equity supply - but they certainly impact the demand (Da Rin et al. 2006). A reduction in the corporate income tax rate is expected to shift the demand curve upwards so that both the return and the quantity increase in equilibrium. In our empirical analysis, we control for the capital gains and corporate income tax rates to assess the effects of intermediaries' fiscal environment properly.

Let us now turn our attention to the legal environment (L_i), which determines systematic risks in the country, and therefore the supply as well as the demand. In Panel a (right picture) of Figure 1 an improvement in the legal environment shifts the supply curve from S_0 to S_1 because private equity investors who are willing to take risks in the companies they finance are satisfied with lower returns. The demand curve shifts upwards from D_0 to D_1 because reducing systematic risks lowers the costs of equity. Thus, companies face more investment opportunities with positive net present values. For the time being, suffice it to say that the effect on the return is undetermined; we will discuss it in greater detail below. In contrast, the impact of a better legal environment on the quantity is straightforward: due to the demand and/or supply shift, countries with strong legal environments have more private equity finance than countries with poor legal environments.

Our first empirical prediction entails these considerations.

P 1a: Domestic investments *increase* c.p. in the soundness of the intermediaries' fiscal environment: $\partial DD_i / \partial F_i > 0$.

P 1b: Domestic investments *increase* c.p. in the soundness of the legal environment: $\partial DD_i / \partial L_i > 0$.

Cross-border private equity investments (CB)

Our empirical predictions concerning cross-border transactions are based on the supply-demand framework introduced above, which we augment to a two-country case. In our simplified world, cross-

border flows are triggered only by return differentials, which result from differences in the fiscal and/or the legal environment. For the moment, we will abstract away from other relevant reasons for private equity investors' geographical decisions where to place their money, such as diversification across countries or deal flow generation. Moreover, we assume the two countries to be identical apart from the intermediaries' fiscal or the legal environment.

In order to exemplify how the intermediaries' fiscal environment creates incentives to invest abroad, let country i , but not country j , have a tax transparent fund structure, while all the other taxes are treated as equal. This case is illustrated in Panel b of Figure 1. In the equilibrium without cross-border transactions, the pre-tax return is higher in country j (right picture) than in country i (left picture), $R_0^i < R_{0,BT}^j$, whereas the post-tax return is lower, $R_0^i > R_{0,AT}^j$. An investor from country i who targets country j , and who is only subject to taxation of its own jurisdiction, only has to regard the pre-tax return ($R_{0,BT}^j$), and not the post-tax return ($R_{0,AT}^j$) as relevant.

The difference in the intermediaries' fiscal environment generates a return differential between country i and j , $R_0^i < R_{0,BT}^j$ which encourages cross-border flows from country i to j . How does an equilibrium with cross-border private equity flows look like in this setting? These flows initiate adjustment processes in both countries. In the absence of distorting factors, private equity investors from country j have an incentive to establish funds in i and to invest in j because their post-tax return is higher when they are located in i . In the new equilibrium with cross-border flows, all funds are located in country i , and are invested at home as well as abroad. As a result, the private equity returns and quantities are identical in both countries in our model world.

However, distorting factors cannot be neglected in the private equity context. One important rationale being, that these transactions require frequent interactions between investors and their portfolio companies. Considering the existence of transaction costs within our simple framework makes it difficult to identify how the new equilibrium looks like, i.e. whether or not domestic transactions are carried out by local investors and whether or not cross-border deals take place. We will start by discussing the incentives of j 's and i 's investors' to locate or to invest abroad. Investors from country j are not provided any incentives to invest their money into companies in i since their revenues are subject to taxes in j . However, the prospect of changing their location to country i is alluring, only as long as the difference between the post-tax return in i and j compensates them for the costs of changing location. Such a move results in a pressure on the return in i (as private equity supply increases) and increases the return in j (as private equity supply decreases). Investors from country i , on the other hand, have an incentive to invest in j whenever they obtain a return which exceeds the one received from domestic companies plus the costs of carrying out a cross-border deal. These cross-border flows increase the return in country i (as supply decreases), while they reduce the (pre-tax) return in j (as supply increases).

In short, the investment volumes in the equilibrium with cross-border flows depend on the transaction costs of cross-border deals and of location change as well as on the fiscal burden investors face in country j (i.e. the difference between the pre-tax and post-tax return). For a certain relation between

transaction costs and the fiscal burden, the new equilibrium is characterized by domestic investments in both countries and by cross-border flows from i to j . Panel b of Figure 1 offers a graphical illustration of this situation. Due to transaction costs, investors located in i require an additional compensation when investing in j . Thus, the pre-tax return in the new equilibrium is higher in country j than in i . The quantity in country i decreases from Q_0^i to Q_1^i , while in j it goes up from Q_0^j without to Q_1^j with foreign investors' participation. Thus, the difference in the intermediaries' fiscal environment between i and j (ΔF_{ij}) encourages cross-border flows from country i to j (CB_{ij}).

As Panel b in Figure 1 suggests, cross-border private equity flows have implications on domestic transactions. Country j , in which no tax transparent fund structure is available, has less investments financed by local investors than country i . Therefore, cross-border flows do not change our empirical prediction P 1a, which stated that the quantity of domestic transactions increases with the improvement of the intermediaries' fiscal environment.

We will now address the role of differences in the legal environment in an international context. Whether differences in the legal environment generate a return differential between countries i and j depends on the positions of the domestic demand and supply curves as well as their slopes. Therefore, we make a distinction between the following two scenarios.

In our first scenario, an improved legal environment results in a higher return in equilibrium. Under particular assumptions, such as there being a higher price-sensitivity of the demand than of the supply curve, the positive return differential coincides with the fact that a change in the legal environment shifts the demand more than the supply.¹ Panel c of Figure 1 illustrates that country i (left picture) possesses a favorable legal environment, while country j (right picture) commands a poor environment. Thus, in the absence of cross-border private equity flows, the return is higher in country i than in j . The positive return differential between i and j , caused by differences in the soundness of the legal environment (ΔL_{ij}), incentivizes investors from country j to target i . In the equilibrium with cross-border flows, transaction costs will again hinder the full equalization of returns: country j has a lower return as well as a lower quantity than i .

In our second scenario, a better legal environment results in a lower return in equilibrium. The country with a stronger legal environment is now characterized by a lower return than the country with the poor legal environment. Therefore, private equity investors located in a country with a strong legal environment are provided an incentive to target the country with the poor legal environment.

¹ The demand and supply curves in country $y \in \{i, j\}$ are given by: $R_y = A_y - bQ_y^D$ and $R_y = C_y + dQ_y^S$ with d and $b > 0$. Country i has a favorable, while j has a less favorable legal environment. A favorable legal environment leads to a higher demand and supply: $A_i = A_j + L^D$ and $C_i = C_j - L^S$, where L^D is the demand and L^S the supply curve shift.

For the equilibrium return without cross-border flows we obtain: $R_y^* = \frac{dA_y + bC_y}{d + b}$.

A positive return differential between countries i and j ($R_i^* > R_j^*$) requires: $L^D > \frac{b}{d}L^S$.

Whenever $b > d$, a positive return differential between i and j implies that the demand must shift more than the supply.

Our second empirical prediction summarizes these considerations for bilateral cross-border private equity transactions:

P 2a: Cross-border transactions from country i to j *increase* c.p. in the difference of the intermediaries' fiscal environment soundness between countries i and j : $\partial CB_{ij} / \partial \Delta F_{ij} > 0$.

P 2b: Cross-border transactions from country i to j ...

... *decrease* c.p. in the difference of the legal environment soundness between countries i and j if a better legal environment leads to higher returns: $\partial CB_{ij} / \partial \Delta L_{ij} < 0$.

... *increase* c.p. in the difference of the legal environment soundness between countries i and j if a better legal environment leads to lower returns: $\partial CB_{ij} / \partial \Delta L_{ij} > 0$.

Internationalization shares (IQ)

If the above discussed effects of the fiscal and legal environments exist, then we should not only observe that private equity investors' domestic deals and bilateral cross-border flows behave in the described manner but also that their internationalization shares (IQ_i), which relate the foreign to total investment, differ systematically within differing fiscal and legal environments. The expected impact of the fiscal and legal environments on internationalization shares results from combining their predicted effects on domestic and cross-border transactions. Ceteris paribus, investors located in a country with a favorable fiscal environment for private equity intermediation feel inclined to invest abroad. Moreover, investors located in countries with strong legal environments will be prone to invest locally if a better legal environment increases returns.

We summarize the effects on the internationalization shares in our third and last empirical prediction:

P 3a: The internationalization share *increases* c.p. in the soundness of fiscal environment for private equity intermediation: $\partial IQ_i / \partial F_i > 0$.

P 3b: The internationalization share ...

... *decreases* c.p. in the legal environment soundness if a sounder environment increases the return: $\partial IQ_i / \partial L_i < 0$.

... *increases* c.p. in the legal environment soundness if a sounder environment decreases the return: $\partial IQ_i / \partial L_i > 0$.

3 The dataset

In the following, we will first describe how we constructed our dependent variables: private equity investors' domestic deals, cross-border transactions and internationalization shares. Then, we proceed by discussing the fiscal and legal environment variables and finish with a description of our control variables.

Domestic and cross-border private equity transactions

In order to figure out how fiscal and legal environments determine private equity investors' decisions in which country to place their money, we use two datasets which cover the period 2000-2006: (i) a unilateral country dataset consisting of 15 countries (to analyze domestic deals and internationalization shares) and (ii) a bilateral country dataset consisting of 210 country pairs (to investigate bilateral cross-border flows). These two datasets we developed from the Bureau van Dijk's ZEPHYR database, which in turn is able to offer information on each individual transaction, e.g. the names and the locations of the target company and the private equity investors involved. On the deal level, the date of the transaction, the deal type and, in approximately 80 percent of the cases, also the aggregate deal volume (i.e. the amount invested in the target company plus the amount paid to the old shareholders) are available. We have approximated the missing deal volumes by the median deal volume in the respective destination country (DC). Appendix 1 describes this database and the transformations we made.

Due to specificities of private equity transactions in general and the dataset at hand in particular, we are forced to set some assumptions when calculating the number and volume of domestic and bilateral cross-border deals. *First*, one specificity of the dataset is that the investor may either be the parent company or, in other cases, the subsidiary. To create a consistent pattern, we define a cross-border transaction as any deal where the target company is not located in the same country as the ultimate parent of the private equity investor. For example, when the German subsidiary of a British private equity investor finances a German company, we assume we are dealing with a cross-border transaction. This procedure changes the investor's home country in 3 percent of the cases only. *Second*, many private equity transactions are syndicated. Often several domestic and foreign private equity investors participate in one deal. In order to quantify the number and the volume of domestic and cross-border deals we have to define whether such a "domestically syndicated" cross-border deal is a domestic or a cross-border deal. We will turn to this issue later. *Third*, we divide the deal (volume) by the number of investors and assign the respective part-deal to the respective source country (SC). For instance, when a German and a French investor have a common transaction in the United Kingdom, we have half a deal between Germany and the United Kingdom and half a deal between France and the United Kingdom. Similarly, the volume is divided.

Panel a in Table 1 provides information on domestic transactions financed by private equity investors located in 15 European countries (for which we have information on the intermediaries' fiscal environment). Over the observation period 2000-2006, the ZEPHYR database contains 5,864 domestic transactions which are associated with a transaction volume of almost €85 billion. The number and volume of domestic private equity deals vary between European countries. Relative to the countries' population, Sweden and Finland have a large number of domestic transactions, while those of the United Kingdom have a high volume. Other European countries, such as Greece and Portugal, have a negligible private equity industry – both in terms of the number and volume of domestic transactions.

Panels b and c in Table 1 depict the number and the volume of cross-border private equity transactions on a country-pair basis and show several interesting facets. (i) The number of cross-border transactions is much smaller than the number of domestic deals. However, domestic and cross-border transactions almost reach the same level when we look at the deal volume. The reason behind this is that the average volume per deal is substantially lower for domestic than for cross-border transactions. (ii) Some countries are important as SCs, while others are important as DCs. The by far most prominent SC is the United Kingdom, both in terms of the transaction number and volume, followed by Germany, France and the Netherlands. Germany and France are also important DCs since they attract the largest cross-border private equity flows. (iii) Some countries have links with many other countries, while others have only one or a few links. For example, the United Kingdom sources private equity transactions in all countries under focus and companies located in the United Kingdom receive private equity from many other European countries. In contrast, Austria is strongly linked to Germany: Austrian private equity investors carry out 60 percent of their cross-border transactions in Germany, and 80 percent of cross-border flows in Austria are financed by German private equity investors.

Panel d in Table 1 depicts countries' internationalization shares, which offer information on how intensively European private equity investors target foreign (other European and also non-European) countries relative to their total investments. For example, the internationalization share of the United Kingdom almost reaches 37 percent (based on the number of transactions) meaning that, on average, British private equity investors carry out 37 percent of their transactions abroad. The internationalization share based on the investment volume is almost always higher than the figure based on the number of deals, which reflects the larger average deal size of foreign compared to domestic transactions.

For our empirical analysis, we scale the number and volume of domestic deals by population because the countries in our sample vary substantially in size. Since we believe that both the SC and DC sizes matter for bilateral cross-border flows (i.e. larger countries both cause and attract more transactions), our scaling factor used for bilateral cross-border flows takes both of them into consideration. Employing the average of the SC and DC population to scale cross-border flows would imply that the capacity for cross-border deals between a large DC and a small SC is equivalent to that of a medium-sized DC and a medium-sized SC. This is, however, hardly the case. Therefore, we scale bilateral cross-border flows by the root of the product of both populations in order to account for a nonlinear relationship between the capital import capacity in the DC and the capital export capacity of the SC.

Table 2 denotes summary statistics of the dependent variables which are to be helpful later on when interpreting the economic relevance of the fiscal and legal environments. The dependent variables are depicted for three alternative labeling procedures of domestically syndicated cross-border deals (i.e. transactions where both, foreign and domestic investors are involved): (A) we divide these deals between the two (or more) countries according to the participation of the investors from these countries; (B) we consider these transactions as being entirely of cross-border nature; (C) we only regard those deals without the participation of domestic investors as being cross-border transactions,

and label domestically syndicated cross-border deals as being domestic. The labeling procedure chosen affects the number and volume of domestic and cross-border deals in an obvious way (see Table 2): Compared to splitting (A), labeling domestically syndicated cross-border deals as domestic transactions (C) increases the amount of domestic deals and decreases the cross-border deals, while the opposite holds when these transactions are labeled as foreign (B).

In order to assess the deal coverage in the little-known ZEPHYR database, we compare it to the European Venture Capital and Private Equity Association (EVCA) database, which has been used intensively in the recent literature on venture capital and private equity finance (e.g. Jeng and Wells 2000, Leleux and Surlemont 2003, Romain and Pottelsberghe 2004, Allen and Song 2005, Da Rin et al. 2006, Armour and Cumming 2006, Schertler 2007). EVCA database informs on aggregate domestic and foreign investments of European private equity investors, but not on bilateral cross-border flows. Appendix 2 relates the figures from the ZEPHYR database to the EVCA database. This comparison, which is not that simple due to different classifications, suggests that the ZEPHYR database includes fewer transactions than reported in the EVCA database focusing on larger deals in later development stages. We use the EVCA database to examine whether our estimation results on domestic deals and internationalization shares are attributable only to the ZEPHYR database or whether they have a more general validity.

Indicators of the fiscal and legal environments

Information on the fiscal environment relevant for the private equity intermediation stems from the Benchmarking Tax and Legal Environments Reports conducted by the EVCA, which are based on surveys under private equity investors. In the course of building our analysis, we are restricted to regarding European countries only, since the Benchmark Reports do not include non-European countries. The EVCA published Benchmark Reports in 2003, 2004 and 2006. We compose our indicator on the sole basis of the Report from 2006 because the contents of the three Reports are not completely compatible and those figures which are included in all three of them show a very small variation over time.

Our indicator of the intermediaries' fiscal environment (F) combines information on the "funds structure" and "retaining talent in fund management companies" (see Table 3) and contains the following items (we only include those items which vary among the countries under consideration). (i) Tax transparency for domestic investors: A fund structure is called tax transparent if the fund is not subject to taxation. If this is the case, taxation only applies for the level of the initial investor after gains and revenues are distributed. The item takes on the value 3 if the country has established a tax transparent investment vehicle's structure and 1 otherwise. (ii) The ability to avoid VAT on management fees: The management fee is an annual management charge received by the management company of the fund. The item takes on the value 3 if the management fee is not subject to VAT and 1 otherwise. (iii) The ability to avoid VAT on carried interest: Carried interest, which typically constitutes 20 percent of the funds' profits, is usually rendered payable when the initial investors have received repayment plus a minimum required rate of return (hurdle rate). The item takes on the value 3 if carried interest is exempted from VAT and 1 otherwise. (iv) Freedom from

undue restrictions: The item takes on the value 3 if no restrictions severely affect investors' decisions, while it takes on a value of 1 when regulations restrict investment decisions in a negative way. (v) Taxation of carried interest: The item equals 3 if carried interest is taxed as capital gains, while it equals 2 if carried interest is taxed as dividends, and it equals 1 if carried interest is taxed as income. Our indicator of the intermediaries' fiscal environment averages these five items; a higher value of our indicator indicates a more favorable fiscal environment. Table 3 shows that several European countries offer a favorable fiscal environment for private equity intermediation, such as Ireland, Sweden, and the United Kingdom. Portugal and Spain, in contrast, have a comparatively poor fiscal environment.

In addition to the intermediaries' fiscal environment, we collect information on the capital gains tax rate (*CG*) and the corporate income tax rate (*C*) in the sample countries. Table 4 exhibits summary statistics on our independent variables; Appendix 3 provides their definitions and sources. The extremely strong correlation between the corporate income tax rate and the capital gains tax rate (see Table 5) prevents us from using both tax rates jointly in our empirical analysis. Since the corporate income tax rate is expected to shift the demand curve only, while the capital gains tax rate is expected to shift the demand as well as the supply curve, we use the capital gains tax rate in order to assess the impact of the intermediaries' fiscal environment properly. We employ the corporate income tax in extensions of our empirical analysis.

For the legal environment (*L*), we use a traditional measure, namely the shareholder rights index developed by La Porta et al. (1997). This index combines several facets of shareholder rights in a single indicator. The indicator varies between 0 and 5 whereas a higher number indicates a better shareholder protection. Some European countries have a strong protection of shareholders, such as the United Kingdom and Ireland, compared to other countries, such as Belgium and Germany.

Correlations between our dependent and independent variables are depicted in Table 5. Panel a provides information as to correlations within the unilateral and Panel b within the bilateral country dataset. When analyzing private equity investors' domestic deals or internationalization shares, we make no further transformations to the fiscal and legal environment variables. Regarding bilateral cross-border flows, we calculate the difference between the indicators' levels in the SC and the DC (SC minus DC). Table 5 demonstrates that the shareholder index is correlated with our proxy for the private equity intermediaries' fiscal environment. We pay particular attention to this correlation when testing whether our estimation results are sensitive to several sources of changes.

Controls

Our first group of control variables captures structural differences in domestic private equity industries. Private equity investors are often subdivided into dependent and independent ones. They are called dependent if their investment decisions can be directly affected by the initial investor (i.e. if they are a subsidiary of the initial investor), while they are called independent if initial investors cannot affect single investment decisions in a direct way. In contrast to its counterpart, the former type is expected to base investment decisions not only on pure risk-return characteristics of the company in

focus, but also on its potential synergy effects with the activity of the initial investors. One should keep in mind that banks are likely set up private equity subsidiaries because in this way they can impact each investment decision directly (Schertler 2005). Hellmann et al. (2008) find evidence that bank-dependent investors offer capital to those companies that are more likely to demand loans later. Thus, by providing private equity finance, banks attempt to build rapport with potential future loan customers. Non-financial corporations may establish subsidiaries if they have an interest in building cooperative relationships and in keeping an eye on new technological developments (Riyanto and Schwienbacher 2006, Birkinshaw et al. 2002). On the contrary, pension funds and insurance companies provide capital predominantly for independent private equity investors. Recent literature documents that investment patterns of private equity funds are dependent on the identity of their initial investors (see Mayer et al. 2005).

The first structural feature of domestic private equity industries we control for in our empirical analysis is the relative amount of funds provided by those initial investors who base their investment decisions predominantly on risk-return considerations. Thus, we control for new funds provided by pension funds and insurance companies relative to total new funds that private equity investors located in a country have risen from local and foreign initial investors ($NF^{PF&IC}$). We expect this percentage to be positively correlated with domestic investments since these financial institutions may foster the development of private equity industries (e.g. Gompers and Lerner 1998, Jeng and Wells 2000). The impact of these initial investors on cross-border investments is undetermined. The measure we use to control for the relevance of pension funds and insurance companies has the advantage that it combines the financial institutions' assets under management and the regulatory framework determining how much of the assets under management can be invested in a particular asset class. Both the financial institutions' funds under management and the regulatory framework vary substantially across European countries. Financial assets of pension funds, for example, accounted for 66 per cent of GDP in the United Kingdom, while they only constituted less than 5 per cent in Austria, Finland, France, Germany, Italy, and Sweden (OECD 2003). The regulatory framework varies from a prudent man rule in e.g. Ireland, the Netherlands and the United Kingdom (EVCA 2004) to quantitative limitations. For example, in Spain, pension funds and insurance companies can invest up to 10 per cent of their assets in unlisted firms (Tejada 2003). Thus, the relevance of these distinguished financial institutions can only be captured if both factors are taken into account; our measure combines both factors.

Besides the relevance of pension funds and insurance companies, we control for the role of governments in private equity finance. Governmental support typically aims at encouraging local investments (e.g. Mayer et al. 2005), and is thus expected to provide domestic private equity investors with incentives to spend their money at home rather than abroad. However, Leleux and Surlemont (2003) hypothesize that public authorities may fail to encourage local investments, but rather crowd out private investors. Since government support has many different facets, from investments by government agencies to guarantees, an all-embracing measure does not exist. We control for the role of governments in private equity finance by employing the percentage of new funds provided by government agencies relative to total new funds raised (NF^{Gov}).

The second group of control variables contains stock market returns and stock market size. Stock market returns (*RET*) have been used to proxy demand conditions (i.a. Gompers and Lerner 1998, Armour and Cumming 2006). Higher returns are expected to indicate a higher demand for private equity finance and thus more domestic deals. Private equity investors' cross-border investment decisions do not only depend on the return in their home countries but also on the return in the foreign countries (e.g. Froot et al. (2001), Brennan and Aranda (1999), Brennan and Cao (1997) for international portfolios). In our analysis of bilateral cross-border flows, we therefore control for the differential in stock market returns between the SC and DC. A positive differential indicates a higher demand in the SC relative to the DC, which is expected to encourage private equity investors to stay at home.

A developed stock market encourages venture capital investments (Jeng and Wells 2000, Black and Gilson 1998, Bascha and Walz 2002) because it offers a profitable exit route and supports investors' reputation building and fund raising (Gompers 1996). These arguments might also hold for the broader investment class of private equity. We control for the size of the stock market by using the number of listed companies relative to population (*COM*), which is expected to impact domestic activities in a positive manner. In an international context, foreign private equity investors may not use local stock markets to divest. In fact, Israeli and Dutch companies often went public on the NASDAQ and not on their domestic IPO markets (Blass and Yafeh 2001, Pagano et al. 2002). Thus, one might argue that foreign investors originate from countries with developed stock exchanges because they may take their investments public on their home IPO markets.

For bilateral cross-border private equity flows, we employ a third group of control variables capturing the legal, cultural and physical proximity between the SC and DC. These measures have been used in the recent literature on international capital flows (e.g. Barron and Valev 2000, Portes et al. 2001, Portes and Rey 2005, Buch 2003, Buch and DeLong 2004). Concerning the legal proximity, we distinguish between French, German, Scandinavian, and English law tradition. If the two countries in question have the same legal tradition (captured by the dummy variable D^{LT}), investors may easier transfer and enforce contractual mechanisms used in their home country to the DC, which increases their willingness to invest. Cultural proximity, reflected in the same vs. different language (D^L), influences the costs of contracting. If the same language is spoken in the SC and DC, contracting costs are lower. As private equity investments more or less require frequent interaction between investors and their portfolio companies, physical proximity may be an important factor for the investment decision since distance (*Dist*) increases transaction costs of international deals.

4 Be at home

We will launch our empirical analysis by tracing out whether favorable fiscal and legal environments trigger private equity investors' domestic transactions, which would support our first empirical prediction. To explain domestic transactions scaled by the population, we use a one-side censored Tobit model which takes the fact into account that a few countries have zero domestic deals in some years. The linear part of the model is as follows:

$$DD_{it} = \beta' x_{it} + u_{it}, \quad \text{with} \tag{1}$$

$$x_{it} = (1, F_i, CG_{it}, L_i, NF_{it-1}^{PF\&IC}, NF_{it-1}^{Gov}, RET_{it-1}, COM_{it-1}, \text{dummies}).$$

Besides the fiscal and legal environment indicators (F_i, L_i), we include private-equity specific variables as well as stock market related variables described in Section 3. To minimize potential endogeneity of our control variables, we use their lagged values. Additionally, we include a full set of year and country dummies to control for time-fixed effects and country-specific time invariant characteristics. Our sample consists of 15 European countries and seven years (2000-2006). Since we lack some return data for Greece, we are left with 102 country-year observations. Table 6 presents the results of the Tobit exercises for the number and volume of private equity investors' domestic deals for the three different labeling procedures of domestically syndicated cross-border deals. In order to assess the economic significance of the variables under focus in explaining domestic deals, we present marginal effects.

The results in Table 6 support our first empirical prediction: a favorable fiscal environment for private equity intermediation increases the number and volume of domestic deals significantly, irrespective of the labeling procedure chosen for domestically syndicated cross-border transactions. The magnitude of the marginal effect varies systematically with the labeling procedure, yet is the largest (resp. smallest) when domestically syndicated cross-border deals are labeled as domestic (resp. cross-border). Besides the statistical significance of the intermediaries' fiscal environment indicator, its economic effect is noteworthy as well. The marginal effect on the domestic deal volumes evaluated at the sample mean of the independent variable, for example, is between 4.7 and 6.2. This is a remarkable magnitude given that the sample average of the domestic deal volume relative to population lies between 2.3 and 2.8 deals per 1,000 inhabitants (see Table 2). The reason for these high marginal effects is that the sample mean of this indicator is 2.56 and the maximum is 3. Thus, the marginal effect is calculated under the assumption that the indicator, starting at 2.56, can be increased by one, which is, however, not possible due to the definition of the indicator. When starting at the mean of 2.56, the indicator can be increased by about 0.44 at a maximum, for example, if Italy or the Netherlands remove their few hindering factors for a favorable fiscal environment for private equity intermediation. Even a small improvement as such would stipulate the domestic deal volume substantially.

The estimation results also underline the relevance of the legal environment for domestic transactions. An improved legal environment, i.e. a stronger shareholder protection, stimulates the volume of domestic transactions significantly, but the deal number remains unaffected. The economic effect of the legal environment on the volume of domestic deals is noteworthy. Starting from the sample mean (2.5) and increasing it to 3.5 is expected to raise the volume of domestic deals relative to population by about one which is, once again, high compared to the mean value (see Table 2). These results do not, however, provide information on whether the positive impact of the legal environment on deal volumes is caused by the demand or the supply curve shift (see discussion in

Section 2). The analysis of private equity investors' cross-border transactions and their internationalization shares, which we carry out below, will offer further insights into this issue.

The effects of our control variables on domestic deals are in line with the reasoning given above and with the findings of the recent literature. The capital gains tax rate has the expected negative effect on the number (but not on the volume) of domestic transactions, but it lacks statistical significance in most specifications. Countries with a higher fraction of new funds provided by pension funds and insurance companies have more domestic deals, while new funds provided by governments have no impact. The latter result is consistent with the findings of the recent literature (Armour and Cumming 2006, Schertler 2007), which relies, however, on a different dataset concerning the country and time dimension as well as the dependent variable used. Higher stock market viability and larger returns trigger domestic transactions. These results correspond with the reasoning given in Black and Gilson (1998) for venture capital industries, which also seems to apply for private equity industries.

We perform four sets of additional regressions to yield insights whether the results we have gained are sensitive to changes (results are not reported but are available upon request). First, since the intermediaries' fiscal environment and the shareholder index are somewhat correlated and since these variables have no variation over time, we run regressions in which we include each variable under focus separately. From these regressions, we exclude the capital gains tax rate and the private equity-specific variables. Irrespective of whether country dummies are included or not, the intermediaries' fiscal environment keeps its sign and significance. Moreover, the shareholder index becomes significant for the number of domestic deals when included individually.

Second, we replace the capital gains tax rate by the corporate income tax rate. While, in some specifications, the capital gains tax rate has the expected negative impact on domestic transactions, the corporate income tax rate does not affect domestic transactions at all. However, its inclusion does not change the results we gained for the intermediaries' fiscal and legal environment.

Third, we exclude the United Kingdom from the sample because the British economy is much more market-based than the rest of Europe in terms of market capitalization and value traded (e.g. Beck and Levine 2002). Furthermore, the private equity industry differs in size (and in structure) from continental European industries. This exercise confirms the role of the intermediaries' fiscal environment and of the shareholder index. Their marginal effects are statistically significant at conventional levels when the United Kingdom is excluded from the sample, albeit the z-values are somewhat lower.

Fourth, as alternative dependent variables, we use the number and volume of domestic private equity investments from the EVCA database. The intermediaries' fiscal environment impacts the number and volume of domestic investments significantly positively, while the shareholder index impacts the volume but not the number of domestic investments significantly positively. Thus, the impact of the legal and intermediaries' fiscal environment on domestic deals holds irrespective of whether we use the ZEPHYR database or the EVCA database.

5 Go abroad

Our second empirical prediction stated that differences in fiscal and legal environments should encourage cross-border private equity flows. In the following, we analyze the number and, alternatively, the volume of bilateral cross-border flows between each pair of countries in both directions separately (i.e. transactions of British investors in Germany in one category, and those of German investors in the United Kingdom in another category). Our dataset consists of $15 \times 14 = 210$ country pairs and seven years (2000-2006); in total we have 1,386 country-pair-year observations due to some missing data. Since annual bilateral cross-border deals (scaled by the root of the product of both populations) are zero for all country pairs without any cross-border transactions in a given year and positive otherwise, we again utilize a one-side censored Tobit model. The linear part of the model may be depicted as follows:

$$CB_{ijt} = \beta' x_{ijt} + u_{ijt}, \text{ with} \quad (2)$$

$$x_{ijt} = (1, \Delta F_{ij}, \Delta CG_{ijt}, \Delta L_{ij}, \Delta NF_{ijt-1}^{PF\&IC}, \Delta NF_{ijt-1}^{Gov}, \Delta RET_{ijt-1}, \Delta COM_{ijt-1}, D_{ij}^{LT}, D_{ij}^L, Dist_{ij}, dummies)$$

We use the same fiscal and legal environment indicators and control variables as in the previous section. However, since the characteristics of both the SC and DC are expected to matter for bilateral cross-border flows we use all independent variables in country-pair differences (SC-DC) denoted by Δ . Moreover, we include our third group of control variables which captures the proximity between the SC and DC. In order to control for changing conditions in time and heterogeneities among countries, we include a full set of year, SC and DC dummies. Table 7 gives results of the Tobit exercises (marginal effects) for the three labeling procedures for domestically syndicated cross-border deals.

Concerning the fiscal environment for private equity intermediation, our estimation results strongly support our second empirical prediction. The difference in the intermediaries' fiscal environment (between SC and DC) impacts the number and volume of bilateral cross-border deals significantly positively, suggesting that private equity leaves countries with favorable and targets countries with less favorable fiscal environments for private equity intermediation. This finding indicates that private equity investors exploit differences in taxation within Europe.

Besides the effects of the intermediaries' fiscal environments, our second empirical prediction deals with impact of the legal environments on bilateral cross-border private equity flows. Estimation results show that the difference in the shareholder index between the SC and DC impacts bilateral cross-border flows significantly negatively. Thus, investors located in countries with a strong legal environment and therefore a high private equity demand are less prone to target companies outside their countries than investors from countries with a poor shareholder protection.

Only some of our control variables have a significant impact on cross-border private equity flows. The difference in the fraction of funds raised by governments only influences the number but not the volume of bilateral cross-border deals significantly negatively, indicating that government support increases incentives to invest at home. As expected, the stock market return differential is negatively related to cross-border flows in almost all model specifications but it lacks statistical significance.

Variables capturing the legal, cultural and physical proximity between the SC and DC are more successful in explaining bilateral cross-border flows. More bilateral cross-border transactions are induced when both countries have the same legal tradition. When the same language is spoken in the SC and the DC, the number of bilateral cross-border deals increases. However, this effect is only statistically significant in two out of three specifications. In line with the recent finding by Bottazzi et al. (2006), who analyze a microeconomic dataset of venture capital investments in Europe, we discover that physical proximity spurs cross-border flows. Legal, cultural and physical closeness between the SC and DC is just as relevant for private equity flows as it is for other international capital flows and cross-border activities (e.g. Buch and DeLong (2004) for cross-border bank mergers, Buch (2003) for banks' foreign asset holdings, Portes and Rey (2005) for equity flows).

We carry out similar robustness checks as implemented for domestic deals in the previous section. We include the intermediaries' fiscal environment and the shareholder index individually in a regression from which the capital gains tax rate and the private equity-specific control variables are removed. The results confirm our findings discussed above: the intermediaries' fiscal environment impacts cross-border flows significantly positively, while the shareholder index influences them significantly negatively. In addition, replacing the difference in the capital gains tax rate by the difference in the corporate income tax rate does not offer additional insights: as the capital gains tax rate, the corporate income tax rate does little to help explain cross-border transactions.

Moreover, we take an interest to the role of the United Kingdom in our sample, not only because of its market-orientation and the size of its private equity industry, but also because of its specific role in the private equity finance internationalization process. US investors, such as *Advent*, *General Atlantic*, and *Benchmark*, used the United Kingdom to systematically enter European private equity industries in the boom phase at the end of the 1990s (Hardymon et al. 2003). Since syndication with local investors played a substantial role, the expertise brought from the United States to the United Kingdom may have changed the business model of British investors. Therefore, we exclude the United Kingdom as a SC and DC from the sample.² The results of our various regression specifications show that the negative impact of the difference in the intermediaries' fiscal environment is not driven by the most developed private equity industry in Europe: the marginal effect of the difference in the intermediaries' fiscal environment retains its sign and significance. The shareholder index, however, completely loses its statistical significance. Yet, when we run regressions in which only the difference in the legal environment, but not the intermediaries' fiscal environment is included, we again assess that legal environment matters in the expected way.

6 Home or abroad?

The positive marginal effect of the difference in the intermediaries' fiscal environment and the negative effect of the difference in the legal environment between the SC and DC provides a first indication of how private equity investors' geographical decisions depend on the environments within

² This reduces the number of observations by 190 and the number of uncensored observations by 162 (when domestically syndicated cross-border deals are split up).

their home countries. However, the above mentioned marginal effects do not inform us whether a stimulating fiscal and poor legal environment in their home countries induces investors to go abroad more often. Therefore, we analyze internationalization shares which capture the geographical investment patterns of private equity investors with respect to their domestic and foreign transactions.

Investors from countries with a favorable fiscal environment are expected to go abroad more frequently due to their fiscal advantage over investors located in countries with a poor fiscal environment for private equity intermediation. Concerning the impact of shareholder protection on investors' internationalization shares, we expect the effect to depend on the relative shifts of the demand and supply curves. If shareholder protection is a demand-related factor, as our results on bilateral cross-border flows presented in the previous section suggest, an improved shareholder protection should lead to lower internationalization shares as investors have incentives to stay at home rather than go abroad.

Again, we estimate six different models with respect to the construction of the dependent variable, which is based either on the number or volume of transactions originating in this country, and for which three alternative treatments of domestically syndicated cross-border deals are employed. Since internationalization shares are sometimes 0 or 100 percent we use a left and right-censored Tobit model. The linear part of the model is:

$$IQ_{it} = \beta' x_{it} + u_{it}, \quad \text{with} \quad (3)$$

$$x_{it} = (1, F_i, CG_{it}, L_i, NF_{it-1}^{PF\&IC}, NF_{it-1}^{Gov}, RET_{it-1}, COM_{it-1}, dummies).$$

Estimation results are presented in Table 8. As expected, the marginal effect on the intermediaries' fiscal environment is positive, suggesting that a more favorable fiscal environment increases the internationalization share. In other words, investors located in countries with a stimulating fiscal environment go abroad more often than investors facing a poor fiscal environment in their home country. This holds in all alternative model specifications. Private equity funds set up in countries where they face favorable fiscal frameworks. Then, they invest in countries with inferior environments, taking (at least part of) their domestic fiscal environment with them, which makes them better off compared to the local investors in the DC. The shareholder index affects the internationalization share significantly negatively suggesting that an improvement in the shareholder protection does indeed impact the private equity demand more strongly than the supply. This result also holds in all model specifications. Thus, investors from countries with stronger shareholder protection have a lower internationalization share than their counterparts from countries with a poor protection.

Our results on the impact of the legal environment in this section confirm our earlier findings from the analysis of domestic and cross-border transactions: within European private equity industries a better legal environment in the investors' home countries stimulates their domestic and reduces their cross-border activities. Thus, for our sample, a better legal environment does not seem to be exported to countries with an inferior environment. This defies the findings of some recent papers (Kelley and Woidtke 2006, Rossi and Volpin 2004, Allayannis et al. 2005) that argue that foreign investors from

countries with strong legal frameworks implement (at least a part of) their legal environment in the target companies. However, the above mentioned studies consider both developing and developed countries, whereas our dataset consists of rather a homogenous sample of developed countries. Moreover, while we deal with private equity activities, Kelley and Woidtke (2006) focus on real investment by multinational companies, Rossi and Volpin (2004) analyze mergers and acquisitions, and Allayannis et al. (2005) investigate firm borrowing.

As discussed in Section 2, lower internationalization shares in countries with a better legal environment are likely to coincide with the legal environment which is influenced more by demand rather than by supply factors. This interpretation requires the private equity supply to be more elastic than the demand, and both of them to be non-zero, which are, however, very realistic assumptions. On the one hand, as Gompers and Lerner (2000) demonstrate, “too much money is chasing too few deals,” implying that the demand for private equity is “far from being perfectly elastic” (Hand 2003). On the other hand, recent literature argues that, at least within the European context, the price elasticity of the private equity supply is very low, but, because investors capital gains are taxed at different rates, it is in fact positive (Da Rin et al. 2006).

Concerning the control variables, we find only few of them to be helpful in explaining internationalization shares. This is consistent with the evidence presented in other studies that use (early-stage or high-technology) shares (e.g. Da Rin et al. 2006). Nevertheless, the effects of two regressors are noteworthy because they both correspond to the effects we found on domestic and cross-border transactions. Countries with a high fraction of capital provided by pension funds and insurance companies have lower internationalization shares. Moreover, the stock market return has the expected negative sign, albeit it lacks statistical significance in most specifications. This negative sign indicates that a high demand in the investors’ home countries, measured by high stock market returns, stimulates domestic relatively to foreign transactions.

We perform additional regressions in order to yield insights into whether the results on the internationalization shares are sensitive to changes. Focusing on the fiscal and legal environment variables individually does not alter our findings: the fiscal environment for private equity intermediation has a positive effect, the capital gains tax rate is insignificant, and the shareholder protection impacts the internationalization share significantly negatively. In addition, excluding the United Kingdom from the sample does not change our results. Moreover, when using internationalization shares based on the EVCA instead on the ZEPHYR database, we find that our results are confirmed; the intermediaries’ fiscal environment impacts the internationalization share significantly positively, while the shareholder index has a significant negative effect.

7 Summary and concluding remarks

In this paper, we explore whether cross-country differences in fiscal and legal environments impact the geography of private equity flows within Europe. For this analysis we use a unique dataset on European transactions which permits the assessment of domestic deals, bilateral cross-border flows, and internationalization shares. In particular, our investigation focuses on two domains of the

environment in which private equity investors operate: (1) the fiscal environment for private equity intermediation and (2) the legal environment, which captures the stance of shareholder protection.

We argue that a sounder intermediaries' fiscal environment increases domestic as well as cross-border transactions and internationalization shares. These effects are caused by a shift in the private equity supply curve, which reduces returns in the investors' home country. Such a reduction generates a cross-country return differential which encourages investors from countries with a favorable fiscal environment for private equity intermediation to go abroad. Our empirical results reveal that investors located in countries with a favorable fiscal environment for private equity intermediation carry out more domestic and cross-border deals, and that they also have higher internationalization shares. These findings suggest that investors from countries with attractive fiscal environments for private equity intermediation are offered the incentive to invest their money in jurisdictions with less favorable fiscal conditions, since they possess comparative advantages over local investors there.

Concerning the legal environment, we argue that its improvement should lead to more domestic transactions, since a better legal environment stimulates the private equity demand and supply. The expected impact of an improvement in the legal environment on cross-border flows and internationalization shares, however, is undetermined. Our estimation results disclose that the favorability of the legal environment in the investors' home country increases domestic transactions, while it decreases bilateral cross-border flows and internationalization shares. These findings may suggest that the legal environment is a demand-related factor.

Due to limitations of our data sample which only covers European countries over a seven year horizon, it might be advisable not to generalize our estimation results. However, the arguments put forward in this paper are not attributable to private equity transactions only; rather they may have implications for a broader class of research dealing with the impact of the fiscal and legal rules on international capital flows. Detecting the implications that the environment exerts on the investment behavior requires the use of appropriate measures for the asset class under focus (Armour and Cumming 2006). In our empirical analysis, the capital gains tax rate (a more general measure) does little to explain private equity investors' domestic and cross-border transactions, while the intermediaries' fiscal environment (a more specific measure) has a significant and economically reasonable impact on private equity investors' transactions at home as well as abroad.

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Table 1: Private equity deals in Europe

Panel a to c provide information on the number and volume (in million euros) of domestic and cross-border deals in 15 European countries for the time period 2000-2006. Panel d instructs us on private equity investors' internationalization shares averaged over the period 2000-2006. All figures are based on ZEPHYR database. Domestically syndicated cross-border deals are split up between domestic and cross-border deals.

Panel a – Domestic deals

	AT	BE	DK	FI	FR	DE	GR	IE	IT	NL	NO	PT	ES	SE	UK	TOTAL
Number	82.7	192.4	176.8	221.4	1164.3	711.3	6.0	110.3	186.0	273.2	62.2	43.7	481.9	366.2	1785.4	5863.7
Volume (in mill. €)	360.2	764.2	665.2	759.0	19551.7	5106.0	27.0	439.2	3680.7	3018.2	318.2	260.8	5732.8	3683.1	40620.1	84986.4
Average volume per deal (in mill. €)	4.4	4.0	3.8	3.4	16.8	7.2	4.5	4.0	19.8	11.0	5.1	6.0	11.9	10.1	22.8	14.5
Number per 1,000 inhabitants	1.0	1.9	3.3	4.3	1.9	0.9	0.1	2.8	0.3	1.7	1.4	0.4	1.1	4.1	3.0	
Volume (in thousand €) per capita	4.4	7.4	12.4	14.6	32.4	6.2	0.2	11.1	6.3	18.7	6.9	2.5	13.2	41.0	68.2	

Panel b – Number of cross-border deals

Destination country	Source country															TOTAL
	AT	BE	DK	FI	FR	DE	GR	IE	IT	NL	NO	PT	ES	SE	UK	
AUSTRIA		1.0	0.0	0.0	0.5	26.1	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	4.8	32.7
BELGIUM	0.0		1.0	0.5	13.1	3.3	0.0	0.0	2.0	19.0	0.0	0.0	0.0	0.5	14.6	54.0
DENMARK	0.0	0.0		6.0	2.1	2.5	0.0	0.0	0.0	2.1	2.1	0.0	0.0	20.1	17.7	52.5
FINLAND	0.0	0.0	1.9		1.4	1.8	0.0	0.0	0.4	1.3	1.0	0.0	0.0	19.4	29.2	56.3
FRANCE	0.0	22.1	1.6	0.0		22.9	0.5	0.0	2.7	30.5	0.0	0.0	1.2	8.3	129.7	219.4
GERMANY	8.8	7.9	5.0	0.7	19.4		0.0	0.0	0.6	22.6	2.0	0.0	0.1	5.3	153.9	226.4
GREECE	0.0	0.0	0.0	0.0	1.0	1.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.5
IRELAND	0.0	2.3	0.0	0.0	2.8	1.0	1.0		0.0	0.0	0.0	0.0	0.0	0.6	36.8	44.4
ITALY	0.0	6.0	0.0	0.0	14.2	8.2	0.0	1.0		9.0	0.0	0.0	0.0	0.5	50.9	89.7
NETHERLANDS	0.0	14.7	0.5	0.2	4.7	11.2	0.0	0.0	0.0		0.3	0.2	2.0	3.3	34.2	71.3
NORWAY	0.0	0.0	1.0	2.8	0.3	0.3	0.0	0.0	0.5	2.0		0.0	0.0	12.9	5.5	25.3
PORTUGAL	0.0	0.0	0.0	0.0	3.3	2.2	0.0	0.0	0.0	1.5	0.0		6.7	0.0	3.3	17.0
SPAIN	0.0	7.7	0.0	0.0	7.3	1.3	0.0	0.0	2.3	20.8	0.0	0.0		0.0	70.5	110.0
SWEDEN	0.0	0.6	15.7	20.4	7.0	8.8	0.2	0.0	0.0	13.4	13.6	0.0	0.0		53.0	132.6
UNITED KINGDOM	1.3	9.5	6.9	4.6	24.5	39.2	3.5	21.8	8.2	38.1	5.5	0.0	8.0	8.3		179.1
TOTAL	10.1	71.7	33.5	35.2	101.4	129.5	5.2	22.8	16.7	160.7	24.4	0.2	17.9	79.3	604.6	1313.2

Table 1-continued

Panel c – Volume of cross-border deals (in million euros)

Destination country	Source country															
	AT	BE	DK	FI	FR	DE	GR	IE	IT	NL	NO	PT	ES	SE	UK	TOTAL
AUSTRIA		1.5	0.0	0.0	1.3	136.7	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	47.8	190.7
BELGIUM	0.0		1.7	7.0	120.2	94.3	0.0	0.0	5.5	145.8	0.0	0.0	0.0	7.0	1179.5	1561.0
DENMARK	0.0	0.0		55.1	1116.1	29.6	0.0	0.0	0.0	17.0	14.8	0.0	0.0	1155.1	828.2	3215.9
FINLAND	0.0	0.0	15.1		18.1	11.2	0.0	0.0	5.3	10.9	2.0	0.0	0.0	1278.4	801.3	2142.3
FRANCE	0.0	125.0	12.4	0.0		1300.4	3.8	0.0	9.6	1101.5	0.0	0.0	18.3	320.0	14976.7	17867.6
GERMANY	27.1	52.0	27.5	7.1	511.5		0.0	0.0	6.9	728.5	4.8	0.0	3.8	3396.8	16349.1	21115.0
GREECE	0.0	0.0	0.0	0.0	6.0	6.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	175.0	187.0
IRELAND	0.0	8.4	0.0	0.0	22.9	6.7	2.5		0.0	0.0	0.0	0.0	0.0	5.8	570.4	616.7
ITALY	0.0	36.0	0.0	0.0	530.5	591.7	0.0	11.0		214.0	0.0	0.0	0.0	425.0	3861.5	5669.8
NETHERLANDS	0.0	124.5	3.5	2.0	31.3	74.6	0.0	0.0	0.0		6.4	1.8	4.4	231.9	8895.2	9375.5
NORWAY	0.0	0.0	5.0	14.9	1.8	1.8	0.0	0.0	2.9	10.6		0.0	0.0	290.2	496.4	823.5
PORTUGAL	0.0	0.0	0.0	0.0	19.5	52.1	0.0	0.0	0.0	27.8	0.0		42.3	0.0	9.2	150.8
SPAIN	0.0	170.2	0.0	0.0	36.4	5.0	0.0	0.0	80.6	140.9	0.0	0.0		0.0	4054.8	4488.0
SWEDEN	0.0	4.4	108.9	94.5	884.0	82.0	3.0	0.0	0.0	185.0	35.3	0.0	0.0		3944.6	5341.7
UNITED KINGDOM	6.2	608.1	118.0	37.9	618.7	2907.8	33.8	131.5	51.2	1251.0	42.1	0.0	100.0	85.2		5991.6
TOTAL	33.2	1130.2	292.2	218.5	3918.2	5299.9	43.2	142.5	161.9	3836.4	105.4	1.8	168.8	7195.4	56189.6	78737.1
Average volume per deal	3.3	15.8	8.7	6.2	38.7	40.9	8.4	6.3	9.7	23.9	4.3	8.8	9.4	90.7	92.9	60.0

Panel d – Internationalization shares

	AT	BE	DK	FI	FR	DE	GR	IE	IT	NL	NO	PT	ES	SE	UK
Share based on ...	Source country														
... the deal number	17.74	36.62	21.12	27.74	15.05	35.00	51.35	21.38	18.72	48.22	38.93	2.09	6.61	29.52	36.93
... the deal volume	21.32	67.77	37.76	41.35	21.27	66.67	53.68	27.39	15.95	61.96	45.81	5.37	7.86	64.25	64.06

Table 2: Summary statistics of dependent variables

This table offers summary statistics of the dependent variables – number and volume (in million euros) of domestic deals (DD), bilateral cross-border deals (CB) and internationalization shares (IQ) in 15 European countries based on annual data for 2000-2006 relative to countries' population. Domestically syndicated cross-border deals are either subdivided into domestic and cross-border deals (A), labeled as cross-border (B) or domestic (C). For further data definitions and sources see Appendix 3, Panel a.

	Mean	Median	Standard deviation	Minimum	Maximum
DD: Domestic deals relative to population (per 1000 inhabitants)					
Number (A)	0.267	0.220	0.215	0.000	1.046
Number (B)	0.234	0.176	0.191	0.000	0.957
Number (C)	0.300	0.225	0.244	0.000	1.160
Volume (A)	2.340	1.328	3.125	0.000	17.092
Volume (B)	1.913	0.933	2.874	0.000	16.751
Volume (C)	2.795	1.451	3.496	0.000	19.136
CB: Bilateral cross-border deals relative to the root of the product of both populations (mill. inhabitants)					
Number (A)	0.039	0.000	0.098	0.000	1.032
Number (B)	0.051	0.000	0.127	0.000	1.150
Number (C)	0.028	0.000	0.078	0.000	0.929
Volume (A)	1.625	0.000	8.359	0.000	113.353
Volume (B)	1.758	0.000	8.582	0.000	113.353
Volume (C)	1.486	0.000	8.182	0.000	113.353
IQ: Private equity investors' internationalization shares					
Number (A)	28.060	28.131	19.642	0.000	100.000
Number (B)	37.329	38.318	22.040	0.000	100.000
Number (C)	20.267	17.757	18.179	0.000	100.000
Volume (A)	41.048	39.681	28.145	0.000	100.000
Volume (B)	52.947	60.055	29.624	0.000	100.000
Volume (C)	30.722	19.675	28.147	0.000	100.000

Table 3: Private equity intermediaries' fiscal environment in Europe based on EVCA

This table summarizes the indicator of the fiscal environment for private equity intermediation which is based on the EVCA's Benchmarking Tax and Legal Environments Report 2006. The indicator includes category A3 of the Benchmark Report (fund structures) and category C8 (retaining talent in fund management companies). We exclude items relevant only for non-domestic investors (tax transparency and permanent establishment for non-domestic investors) from our indicator. Moreover we exclude those items which do not vary across the countries under consideration. As a result, our indicator includes the tax transparency for domestic investors, the ability to be exempted from VAT on management fees, freedom from undue restrictions on investments, the ability to be exempted from VAT on carried interest, and the taxation of carried interest.

	AT	BE	DK	FI	FR	DE	GR	IE	IT	NL	NO	PT	ES	SE	UK
<i>Fund structure</i>															
A dedicated domestic fund structure for private equity and venture capital	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Tax transparency for domestic investors	1	1	3	3	3	3	3	3	1	3	3	3	1	3	3
Tax transparency for non-domestic investors	1	1	3	3	1	3	3	3	1	3	3	3	1	3	3
Ability to avoid permanent establishment for non-domestic investors	3	3	2	3	3	3	3	2	3	1	1	3	3	1	3
Ability to be exempted from VAT on management fees	3	3	1	3	3	1	3	3	3	3	3	3	1	3	3
Ability to be exempted from VAT on carried interest	3	3	3	3	3	1	3	3	3	3	3	1	3	3	3
Freedom from undue restrictions on investments	1	3	3	3	3	3	1	3	3	3	3	1	1	3	3
<i>Retaining talent in fund management companies</i>															
Ability to incorporate a performance-related incentive for the fund managers	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Taxation of carried interest	3	2	3	2	3	2	3	3	3	1	3	1	3	3	3
Our indicator of the intermediaries' fiscal environment (F)	2.2	2.4	2.6	2.8	3	2	2.6	3	2.6	2.6	3	1.8	1.8	3	3

Table 4: Summary statistics of independent variables

This table supplies descriptive statistics for the independent variables (based on 15 European source countries). For data definitions and sources see Appendix 3.

		Mean	Median	Standard deviation	Minimum	Maximum
Fiscal and legal environments						
Intermediaries' fiscal environment	<i>F</i>	2.560	2.600	0.421	1.800	3.000
Capital gains tax rate (%)	<i>CG</i>	30.490	30.000	4.910	20.000	40.000
Corporate income tax rate (%)	<i>CI</i>	30.623	30.750	5.470	12.500	40.000
Shareholder index	<i>L</i>	2.467	2.000	1.204	0.000	4.000
Private equity industry-specific variables						
New funds by PF and IC (t-1)	<i>NF^{PF&IC}</i>	21.147	19.319	17.284	0.000	58.439
New funds by government (t-1)	<i>NF^{Gov}</i>	10.070	6.778	12.026	0.000	76.947
Returns and stock market size						
Returns (t-1)	<i>RET</i>	0.129	0.117	0.278	-0.378	0.720
SM listed companies (t-1)	<i>COM</i>	0.023	0.017	0.016	0.005	0.076
Legal, cultural and physical proximity of SC and DC						
Same law	<i>D^{LT}</i>	0.276	0		0	1
Same language	<i>D^L</i>	0.067	0		0	1
Log of distance	<i>Dist</i>	7.074	7.183	0.648	5.153	8.121

Table 5: Correlation between variables

This table depicts correlation coefficients between our variables. Panel a is based on the country level whereas Panel b includes variables from the bilateral dataset (country-pairs). Δ denotes the difference between the source and destination country. For variable definitions and sources see Appendix 3. * denotes significance at the 10 percent level.

Panel a – Unilateral dataset

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Number of domestic deals (A)	1								
(2) Volume of domestic deals (A)	0.5248*	1							
(3) Intermediaries' fiscal environment	0.4957*	0.4150*	1						
(4) Capital gains tax rate	-0.2952*	-0.0723	-0.1842*	1					
(5) Corporate income tax rate	-0.3287*	-0.0844	-0.3050*	0.9127*	1				
(6) Shareholder index	0.3246*	0.3688*	0.4054*	-0.3679*	-0.4123*	1			
(7) New funds by government (t-1)	-0.1948*	-0.2067*	-0.3035*	-0.1823*	-0.1837*	-0.0314	1		
(8) New funds by PF and IC (t-1)	0.6710*	0.5271*	0.4405*	-0.2456*	-0.2416*	0.3399*	-0.1415	1	
(9) Returns (t-1)	0.1555	0.1118	0.0496	-0.1231	-0.0928	0.0367	0.1163	0.1407	1
(10) SM listed companies (t-1)	0.2792*	0.2435*	0.1203	0.0649	0.0223	0.5690*	0.027	0.2198*	0.0901

Panel b – Bilateral dataset (country-pair differences)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Number of cross-border deals (A)	1											
(2) Volume of cross-border deals (A)	0.4315*	1										
(3) Δ Intermediaries' fiscal environment	0.0542*	0.0924*	1									
(4) Δ Capital gains tax rate	0.0249	-0.0083	-0.2608*	1								
(5) Δ Corporate income tax rate	0.0161	-0.0044	-0.3553*	0.9070*	1							
(6) Δ Shareholder index	0.0347	0.1059*	0.4054*	-0.4459*	-0.4733*	1						
(7) Δ New funds by government (t-1)	-0.0348	-0.0128	-0.3106*	-0.0893*	-0.0459*	-0.0322	1					
(8) Δ New funds by PF and IC (t-1)	0.0466*	0.0755*	0.4437*	-0.2810*	-0.2775*	0.3424*	-0.1285*	1				
(9) Δ Returns (t-1)	-0.0295	-0.0003	0.0713*	-0.0781*	-0.0437	0.0613*	0.0990*	0.2050*	1			
(10) Δ SM listed companies (t-1)	0.0265	0.0864*	0.1204*	0.0560*	0.0221	0.5695*	0.0228	0.2261*	0.1230*	1		
(11) Same law in SC and DC	0.2392*	-0.0087	-0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1	
(12) Same language in SC and DC	0.3242*	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2619*	1
(13) Log of distance between SC and DC	-0.4276*	-0.2017*	-0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.1999*	-0.4674*

Table 6: Domestic deals

This table indicates marginal effects (for the unconditional expected value) of left-censored Tobit estimations for domestic deals relative to the population in 15 European countries for the time period 2000-2006. Censoring value is 0. White-heteroscedasticity-consistent z-values are given in parentheses. ***, **, * denote significance at the 1, 5, and 10 percent level. For data definitions and sources see Appendix 3.

Domestically syndicated cross-border deals are...	split up	labeled cross-border	labeled domestic	split up	labeled cross-border	labeled domestic
	Number			Volume		
Intermediaries' fiscal environment	0.193*** (5.31)	0.174*** (5.07)	0.205*** (5.25)	5.543*** (3.90)	4.735*** (3.43)	6.235*** (4.22)
Capital gains tax rate	-0.005 (-1.60)	-0.003 (-0.91)	-0.007** (-2.16)	0.036 (0.69)	0.043 (0.90)	0.021 (0.34)
Shareholder index	0.012 (0.48)	0.018 (0.78)	0.004 (0.16)	1.029*** (2.80)	0.950*** (2.66)	1.108*** (2.65)
New funds by PF and IC (t-1)	0.002** (2.48)	0.001* (1.88)	0.003*** (3.09)	0.039*** (2.90)	0.030** (2.45)	0.049*** (3.29)
New funds by government (t-1)	0.001 (0.72)	0.000 (0.43)	0.001 (0.84)	0.001 (0.04)	0.001 (0.07)	-0.002 (-0.10)
Returns (t-1)	0.132*** (2.61)	0.148*** (2.90)	0.131** (2.56)	0.273 (0.33)	0.256 (0.33)	0.686 (0.85)
SM listed companies (t-1)	2.486*** (2.59)	2.088** (2.25)	2.953*** (2.89)	30.148* (1.83)	21.032 (1.36)	40.188* (1.93)
Country dummies	YES	YES	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES	YES	YES
χ^2	1031.727	878.521	1052.829	173.241	112.37	195.829
Number of observations	102	102	102	102	102	102
Left censored observations	2	2	2	2	2	2
Uncensored observations	100	100	100	100	100	100

Table 7: Bilateral cross-border deals

This table delineates marginal effects (for the unconditional expected value) of left-censored Tobit estimations for cross-border deals between 210 country pairs for the time period 2000-2006. Censoring value is 0. Δ denotes the difference between the source and destination country. White-heteroscedasticity-consistent z-values are given in parentheses. ***, **, * denote significance at the 1, 5, and 10 percent level. For data definitions and sources see Appendix 3.

Domestically syndicated cross-border deals are...	split up	labeled cross-border	labeled domestic	split up	labeled cross-border	labeled domestic
	Number			Volume		
Δ Intermediaries' fiscal environment	0.030*** (5.12)	0.036*** (4.88)	0.014*** (4.89)	3.468*** (5.49)	3.532*** (5.51)	1.736*** (5.32)
Δ Capital gains tax rate	0.000 (0.22)	0.000 (0.27)	0.000 (-0.03)	0.011 (0.94)	0.011 (0.93)	0.005 (0.77)
Δ Shareholder index	-0.006*** (-4.32)	-0.008*** (-4.49)	-0.002*** (-2.97)	-0.426*** (-3.74)	-0.438*** (-3.75)	-0.138** (-2.51)
Δ New funds by PF and IC (t-1)	0.000 (0.38)	0.000 (0.53)	0.000 (-0.08)	0.000 (0.04)	0.000 (0.08)	-0.001 (-0.23)
Δ New funds by government (t-1)	-0.000*** (-2.59)	-0.000*** (-2.63)	-0.000** (-2.06)	0.000 (0.04)	0.000 (0.05)	0.001 (0.33)
Δ Returns (t-1)	-0.333 (-1.31)	-0.432 (-1.34)	-0.059 (-0.57)	-17.833 (-0.96)	-19.947 (-1.04)	0.152 (0.02)
Δ SM listed companies (t-1)	0.012 (0.18)	0.005 (0.06)	-0.002 (-0.07)	5.107 (1.01)	5.302 (1.01)	0.925 (0.38)
Same law in SC and DC	0.045*** (7.42)	0.059*** (7.70)	0.018*** (5.60)	1.697*** (4.85)	1.752*** (4.92)	0.974*** (4.49)
Same language in SC and DC	0.015** (2.07)	0.022** (2.28)	0.003 (1.23)	-0.068 (-0.25)	-0.067 (-0.25)	-0.005 (-0.04)
Log of distance between SC and DC	-0.013*** (-6.25)	-0.018*** (-6.74)	-0.004*** (-4.89)	-0.643*** (-3.64)	-0.690*** (-3.78)	-0.298*** (-3.53)
SC Dummies	YES	YES	YES	YES	YES	YES
DC Dummies	YES	YES	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES	YES	YES
χ^2	578.292	609.656	495.064	123.907	132.495	135.67
Number of observations	1,386	1,386	1,386	1,386	1,386	1,386
Left-censored observations	908	908	1038	908	908	1038
Uncensored observations	478	478	348	478	478	348

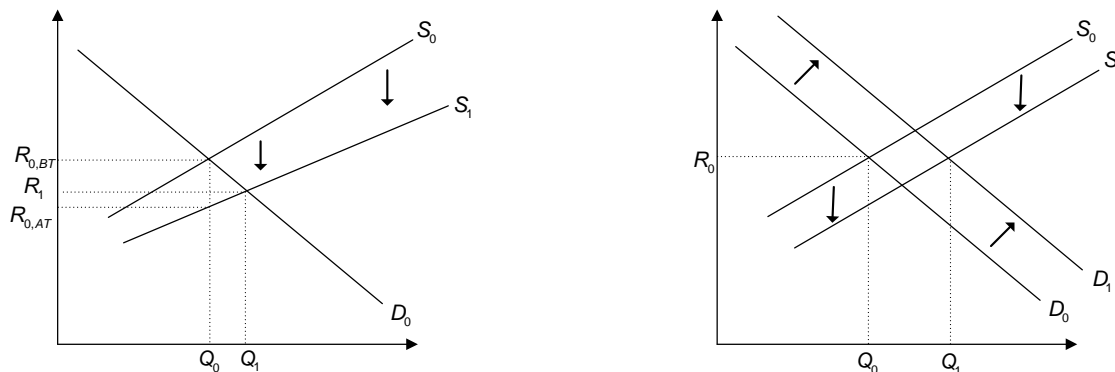
Table 8: Internationalization shares

This table provides marginal effects (for the unconditional expected value) of left and right-censored Tobit estimations for internationalization shares of private equity investors located in 15 European countries for the time period 2000-2006. Censoring values are 0 and 100. White-heteroscedasticity-consistent z-values are given in parentheses. ***, **, * denote significance at the 1, 5, and 10 percent level. For data definitions and sources see Appendix 3.

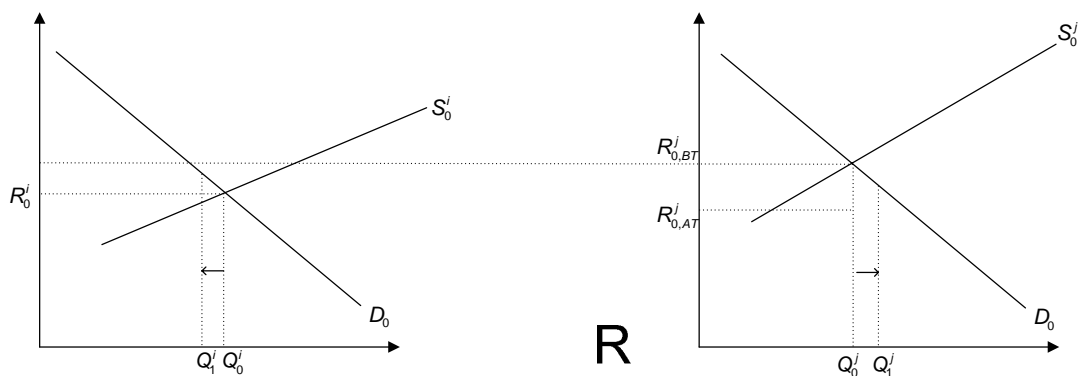
Domestically syndicated cross-border deals are...	split up	labeled cross-border	labeled domestic	split up	labeled cross-border	labeled domestic
	Number	Number	Number	Number	Volume	Volume
Intermediaries' fiscal environment	36.135*** (6.26)	54.610*** (8.18)	24.276*** (3.99)	58.980*** (5.58)	79.051*** (7.15)	48.738*** (3.74)
Capital gains tax rate	-0.251 (-0.87)	-0.35 (-1.09)	-0.082 (-0.35)	-0.62 (-0.93)	-0.729 (-1.10)	-0.405 (-0.58)
Shareholder index	-9.489*** (-4.65)	-11.638*** (-4.91)	-6.690*** (-3.73)	-20.047*** (-4.62)	-20.164*** (-5.06)	-18.248*** (-3.64)
New funds by PF and IC (t-1)	-0.139* (-1.75)	-0.163* (-1.73)	-0.139* (-1.93)	-0.287* (-1.92)	-0.334* (-1.93)	-0.317** (-2.27)
New funds by government (t-1)	-0.154 (-1.05)	-0.145 (-0.90)	-0.106 (-0.80)	-0.157 (-0.65)	0.054 (0.22)	-0.18 (-0.75)
Returns (t-1)	-4.852 (-1.12)	-8.349* (-1.66)	-1.98 (-0.53)	-3.319 (-0.37)	-5.175 (-0.61)	0.888 (0.10)
SM listed companies (t-1)	-29.521 (-0.30)	-59.695 (-0.52)	-30.282 (-0.38)	-47.364 (-0.23)	-111.167 (-0.51)	-41.248 (-0.21)
Country dummies	YES	YES	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES	YES	YES
χ^2	812.212	777.761	679.06	642.432	867.073	337.601
Number of observations	102	102	102	102	102	101
Left-censored observations	5	5	8	5	5	8
Right-censored observations	2	2	2	2	2	2
Uncensored observations	95	95	92	95	95	91

Figure 1: The impact of the fiscal and legal environment on domestic and cross-border deals
 Panel a of this figure shows the impact of a change in intermediaries' fiscal environment and the legal environment on the private equity demand and supply in a closed economy. R denotes the risk-adjusted expected return, Q the quantity of private equity finance. Panel b (Panel c) shows the impact of differences in the intermediaries' fiscal environment (legal environment) on cross-border deals in a two-country setting.

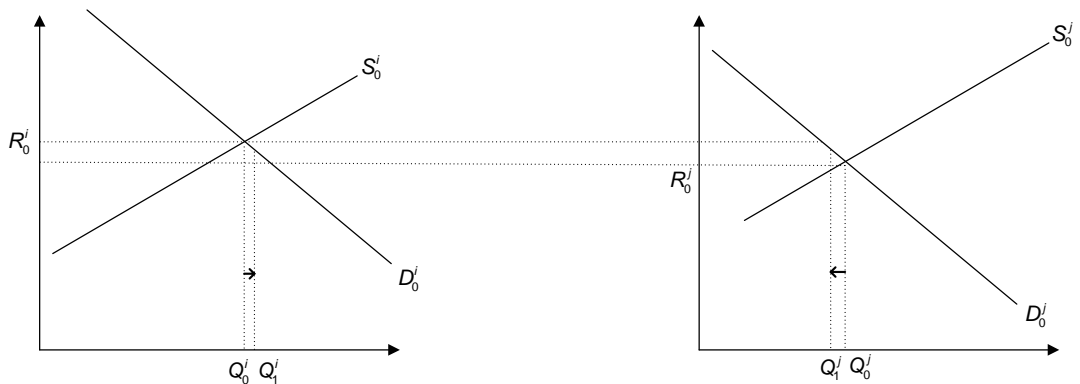
Panel a – Domestic deals (one-country setting)



Panel b – Cross-border deals and the intermediaries' fiscal environment (two-country setting)



Panel c – Cross-border deals and the legal environment (two-country setting)



Appendix 1: The ZEPHYR database and the generation of our dataset

Data on domestic and cross-border private equity transactions stem from Bureau van Dijk Electronic Publishing, which provides deal-based transaction data in the ZEPHYR database. This information platform initially aimed at M&A transactions, but also conveys IPO and private equity data. 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 the ZEPHYR database lies in its very broad scope, which includes all countries around the globe. Additionally, smaller deals are covered relatively well. However, a disadvantage of this database is in its short time-horizon, which starts in the late 1990s. Moreover, in the first years the database had a strong European focus. Since 2003, Bureau van Dijk claims to have covered all deals worldwide.

For each transaction, besides the names of the target company and all investors, the ZEPHYR database contains a wide range of information on the participating parties, such as their countries of origin, parent companies, business descriptions and US SIC codes. Moreover, a unique identification number is assigned to each investor and to each company. On the deal level, the date of the transaction, deal type, and in approximately 80 percent of the cases, also the deal volume are available. The deal volume consists of the sum of the investment amount in the target company and the amount paid to old shareholders. For the sake of the aggregate level analysis, we have approximated the missing deal volumes by the median deal volume in the respective destination country. Moreover, the deal 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 spent. We assign equal investments to each of the participating investors in this case.

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

We have classified the private equity deals from the ZEPHYR database using several criteria. In the first step, we have searched the database for transactions 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 have retained only those deals in which the business description of at least one investor included “venture capital” or “private equity”.

We have deleted all deals in which either the investors' names, the company name, or the country information were lacking, as well as those that have been recorded for “wealthy individuals”, “institutional investors” or other non-identifiable investors (without an identification number). Furthermore, we have also excluded all deals where the target company and its investor have been identical. According to their business descriptions and US SIC codes, we have classified the targets into financial vs. non-financial corporations and have kept only non-financial corporations in our sample. We have filled missing company (investor) information from other deals where the company (investor) identification number was identical. Moreover, we have excluded all transactions that have been classified as share buy-back operations, IPOs, demergers, etc.

The next step in reorganizing the dataset has required more sophistication because we have got closer to the organizational structure of private equity investors. 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 dependent private equity companies, sometimes the parent company, whereas in other cases the subsidiary is indicated as investor. We have aggregated all information to the highest level using the information on ultimate parent companies offered by ZEPHYR in order to have a consistent pattern.

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 a drawback of this feature? Let investor A take over a share in the target company Z on January 1st 2004. If another investor B took over investor A on January 1st 2003, we would attribute the above mentioned deal to B, because B became A's parent before the transaction had been conducted. However, if B took over A on January 1st 2005, the above indicated deal is carried out by A, because at the date of the deal, A and B are independent. But – using the parent information offered by ZEPHYR – we would falsely assign this deal to B because B is indicated as A's parent. To correct this “mistake” for all our investors, we have checked (within the ZEPHYR deal database) whether they were acquired or merged during the period under observation. All deals before a potential acquisition or merger date (in the latter example January 1st 2005) have been assigned to the initial investor, all deals after this date to its parent company.

Appendix 2: ZEPHYR versus EVCA

Several studies on European private equity and venture capital have been built on data published by the European Private Equity and Venture Capital Association (EVCA, www.evca.com). On an annual basis, the EVCA Yearbook offers statistical material for European countries which discloses information on private equity investments and funds raised on an aggregate level. EVCA obtains data from national private equity and venture capital associations, such as the British Association (www.bvca.co.uk) or the German Association (www.bvk-ev.de) that collect data on private equity activities by sending questionnaires to their members and non-members. The national associations and the EVCA use several correction procedures to approximate total private equity activity in the countries under focus. For example, the German Association reported a fund raising volume of more than €7 billion in 2005. The EVCA shifted a fund internationally raised from Germany to the United Kingdom and reported only a fund raising volume of only €3 billion for Germany.

The EVCA database differs from the ZEPHYR database in several respects. (i) The EVCA database supplies information on several interesting facets of European private equity industries. However, it only offers information on an aggregate country level but not on a country-pair level. In contrast, the huge advantage of the ZEPHYR database is that it includes information on single cross-border transactions, which makes the calculation of deal flows on the country-pair level possible. (ii) The EVCA database reports the amounts invested in companies by private equity investors and not the total transaction volume of the deal by private equity and non-private-equity investors as the ZEPHYR database does. The transaction volume comprises the amount invested in the company and the amount that old shareholders receive both in form of equity and debt. (iii) The EVCA database takes into account all types of private equity investors (independent, government-related, corporate, bank or insurance company dependent), while government-related agencies or agencies with a public contract (such as Mittelständische Beteiligungsgesellschaften in Germany) are underrepresented in the ZEPHYR database. (iv) It was not until 2004 that the EVCA used the data for single deals and single funds to build its annual database. Thus, ever since 2004, the data quality has been substantially improved. Prior to this year, when EVCA just returned information reported by national venture capital and private equity associations, several problems arose. For one, syndicated deals were counted several times, since each private equity investor involved in a deal reported this deal separately on a portfolio basis. As a result, the EVCA was unable to determine the number of private-equity-financed companies and investment volumes properly. Thus, the EVCA and ZEPHYR databases are not directly comparable.

Nevertheless, in the following we provide some figures which enable us to gain a few insights into the differences between the ZEPHYR and the EVCA database. To match the two databases as closed as possible, we report the number of private equity investors' domestic, European and non-European foreign transactions averaged over 2004 and 2005. In the following table, we compute the average number of deals in which private equity investors from the countries under focus have participated (domestic and cross-border deals). The numbers from the ZEPHYR database include all types of targets, i.e. not only non-financial corporations as used in our analysis (which implies that the deal numbers from ZEPHYR presented below differ from the numbers given in Table 1). Moreover, we report three different figures from the EVCA database. The first number captures total investments in companies (early and expansion stage, replacement capital and buy-out activity). Because it relies on publicly available information, we believe that the ZEPHYR database has a selection bias towards larger transactions which usually take place in companies' later stages of development. Therefore, in the next column we report the number of transactions without investments in companies' seed and start-up stages from the EVCA. The last number reported captures only replacement capital and buy-out transactions from the EVCA. The total number of deals included in the ZEPHYR database is substantially lower than the total number of deals included in the EVCA database. However, when investments in companies in the early stage of development are excluded from the EVCA database, the gap in the number of deals reported in the two datasets narrows. Focusing on replacement capital and buy-out deals of the EVCA database suggests that the ZEPHYR database not only includes these late stage deals, but also some deals that took place in earlier stages.

	ZEPHYR (number of deals)		EVCA (number of deals)	
	Total	Total	Excl. early stage deals	Replacement, buy-out
AUSTRIA	43.5	197.5	131.5	32
BELGIUM	106.5	326	194.5	76
DENMARK	94.5	441	212	42
FINLAND	100.5	354	175.5	52.5
FRANCE	695.5	2001	1347.5	629
GERMANY	541.5	1393.5	887	139
GREECE	27	5.5	3	1
IRELAND	44.5	137	78	2.5
ITALY	128	261	208	77.5
NETHERLANDS	171	543.5	494.5	222.5
NORWAY	46.5	229	132	18.5
PORTUGAL	17	189.5	117	16.5
SPAIN	197	491.5	369	41.5
SWEDEN	188	729.5	454.5	152
UNITED KINGDOM	1272	2988	2034	917.5
TOTAL	3673	10287.5	6838	2420

Appendix 3: Data description and sources

Panel a: Dependent variables

	Variable	Description and source
DD_{it}	Domestic deals	The number (N) or volume (V, in million euros) of domestic deals in country i in year t , relative to the country's population. The deal number is given per 1,000 inhabitants. (Source: ZEPHYR, Thomson Financial Datastream)
CB_{ijt}	Cross-border deals	The number (N) or volume (V, in million euros) of cross-border deals from private equity investors located in country i to portfolio companies located in country j in year t relative to $(pop_i \times pop_j)^{0.5}$, where pop is the population in million. (Source: ZEPHYR, Thomson Financial Datastream)
IQ_{it}	Internationalization share	The private equity investors' internationalization share based on transaction numbers and volumes calculated as: cross-border deals divided by total (= sum of cross-border and domestic) deals in the investors' home country i in year t . Cross-border deals capture worldwide transactions. (Source: ZEPHYR)

Labeling procedure of domestically syndicated cross-border deals

Domestic and cross-border deals and internationalization shares which we calculated from the ZEPHYR database depend on how we define domestically syndicated cross-border deals (deals in which domestic and foreign investors participate jointly). We use three different labeling procedures. Domestically syndicated cross-border deals

- (A) are subdivided into foreign and domestic deals according to the number of participating investors;
- (B) are labeled as cross-border deals;
- (C) count as domestic deals.

Panel b: Independent variables

Variable	Description and source	
<i>Fiscal and legal environment</i>		
<i>F</i>	Intermediaries' fiscal environment	The average score of the items in "funds structure" and "retaining talent in funds management companies" (see Table 3 for more details). A higher value indicates a more favorable environment. (Source: EVCA 2006)
<i>CG</i>	Capital gains tax rate	Top capital gains tax rate. (Source: Ernst and Young (various issues))
<i>CI</i>	Corporate income tax rate	Top corporate income tax rate. (Source: Ernst and Young (various issues))
<i>L</i>	Shareholder index	An index depicting shareholder rights. The index is formed by adding 1 when (i) the country allows shareholders to mail their proxy vote, (ii) shareholders are not required to deposit shares prior to the general shareholders' meeting, (iii) cumulative voting is allowed, (iv) an oppressed minorities mechanism is in place, (v) when the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholders' meeting is less than or equal to 10%. (Source: La Porta et al. 1997)
<i>Controls</i>		
<i>NF^{PF&IC}</i>	New funds by PF and IC	New funds provided by pension funds and insurance companies relative to total new funds raised for private equity investments. (Source: EVCA Yearbook, various issues)
<i>NF^{Gov}</i>	New funds by government	New funds provided by government agencies relative to total new funds raised for private equity investments. (Source: EVCA Yearbook, various issues)
<i>RET</i>	Returns	Stock market return based on MSCI performance index. (Source: Thomson Financial Datastream)
<i>COM</i>	SM listed companies	The number of companies listed on a stock market divided by population. (Source: Emerging Stock Market Factbook (various issues), Thomson Financial Datastream)
<i>D^{LT}</i>	Same law	A dummy variable equal to one if the SC and DC have the same legal tradition based on French, German, British or Scandinavian law. (Source: La Porta et al. 1998)
<i>D^L</i>	Same language	A dummy variable equal to one if the same language is spoken in the SC and DC. (Source: www.cepii.fr)
<i>Dist</i>	Log of distance	The logarithm of the distance between the SC and DC in kilometers. (Source: www.cepii.fr)

Panel c: Datasets used and transformation of independent variables

For our empirical analysis, we use two different datasets:

- (1) A unilateral dataset is used to analyze private equity investors' domestic transactions and internationalization shares. Independent variables are based on the investors' home country.
- (2) A bilateral dataset is used to analyze cross-border deals between the investors' home country (the source country) and the portfolio companies' country (the destination country). All independent variables y (except the variables capturing proximity) are used in country differences defined as $y_{SC} - y_{DC}$.