Private Equity Cross-border Investments
Using the Gravity Model to Evaluate Transaction
Patterns Across Countries and Years

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ABSTRACT
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International private equity development is highly volatile with increasing global diversification. This thesis examines the transaction patterns of cross-border private equity investment with a particular focus on the affinity of country pairs. Analysis is based on a comprehensive dataset of 99 countries over 25 years. A three-dimensional gravity model analysis covering source and host country over time exposes the effects of the country determinants: economic mass, economic distance, banking system, corporate endowment, as well as legal, political, and institutional system on the transactions. A new method is developed to examine countries in their dual roles as investor and target. This approach verifies their global importance as source and host, and also makes possible an analysis of overall private equity investment. For private equity-specific multi-investor deals, a scheme is designed to measure cross-border activity with more precision by participation, proportional deal participation, and deal flow. The analysis identifies intense level of affinity between country pairs and reveals that no single country is ideal for private equity activity. Instead, the findings show that the specific push and pull factors within each country constellation define the optimal country as trading partner. The results verify a correlation between cross-border deals and economic masses and reduced economic distance of countries. Geographic distance and cultural similarities, such as language and legal system, intensify the likelihood of initiating transactions. International trade-oriented countries with a high level of development lower the entrance barriers and increase the chances of deal success. A well-funded financial system for the investor and an efficient and competitive banking system of target countries enhance the probability of investment between countries. Also relevant for the likelihood of starting cross-border deals are low corporate tax burdens and advanced scientific competitiveness, and a well-developed stock market in the investor country. Fundamental to frequency and likelihood of success are well-established, high standards of a country's social, political, and legal systems with widespread confidence in the rules of society. In particular, the reliability of contract enforcement, with proven quality of regulations that promote private sector development, proves to be crucial for deal success.

ABSTRACT
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Die Entwicklungen der Private Equity Investitionen sind sehr volatil mit sich verstärkender globaler Diversifikation. Die vorliegende Arbeit untersucht internationale Private Equity Investitionsmuster für eine Grundgesamtheit von 99 Ländern über 25 Jahre. Eine dreidimensionale Gravity-Modell-Analyse mit Quelle, Ziel und Zeitpunkt der Investitionen identifiziert die Effekte der Länderdeterminanten Ökonomische Masse, Ökonomische Distanz, Güte des Finanzsystems, unternehmerische Ausstattung des Landes als auch die Art des Rechts-, Politik- und Sozialsystems. Hierzu wurde eine neue Methode entwickelt, die Länder in ihrer dualen Rolle als Quell- und Zielland für Investitionen untersucht. Dieser Ansatz ermöglicht es sowohl ihre Bedeutung als Investor und Ziel als auch ihre kummulierte Private Equity Aktivität zu verifizieren. Für die Private Equity spezifischen Multi-Investor-Transaktionen wurde ein Schema entwickelt, das zur Erhöhung der Sensibilität der Messung von internationaler Aktivität die Beteiligung und proportionale Beteiligung von Investoren sowie den Betrag der Investitionen berücksichtigt. Die Analyse bestätigt eine starke Affinität zwischen bestimmten Ländern und verifiziert, dass es das optimale Land für grenzüberschreitende Private Equity Investitionen nicht geben kann. Sie zeigt vielmehr, dass es spezifische Anziehungs- und Abstoßungskräfte zwischen den Ländern gibt, die den optimalen Investitionspartner definieren. Die Ergebnisse weisen auf einen Zusammenhang zwischen Investition und ökonomischer Massen und ökonomischer Nähe der Länder hin. Besonders geographische Distanz und kulturelle Gemeinsamkeiten wie Sprache und Rechtssystem verstärken den Effekt. Starker Im- und Export und hohe ökonomische Standards verringern die Eintrittsbarrieren und erhöhen die Wahrscheinlichkeit für Investitionen. Ein kapitalkräftiges Finanzsystem des Investorlandes und ein effizientes Bankensystem des Ziellandes begünstigen den Austausch zwischen den Ländern. Weiter relevant sind niedrige Steuern, hohe wissenschaftliche Konkurrenzfähigkeit und ein gut entwickeltes Börsensystem im Investorland. Fundamental für den Erfolg sind hohe Standards des Sozial-, Staats- und Rechtssystems mit Vertrauen in die Regeln des Gesellschaftssystems, vor allem in das Vertragsrecht und in Regularien, die die Entwicklungen des Privatsektors fördern.

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List of Abbreviations & Acronyms

ANOVA   Analysis of Variance

BvK   Bundesverband für Kapitalbeteiligungsgesellschaften

CIA   Central Intelligence Agency

EIU   Economic Intelligence Unit

EVCA   European Venture Capital Association

FDI   Foreign Direct Investment

GDP   Gross Domestic Product

IFS   International Financial Statistics

ILO   International Labour Organization

IMF   International Monetary Fund

IPO   Initial Public Offering

OECD   Organization for Economic and Co-operation and Development

PE   Private Equity

PF   Portfolio Company

R&D   Research and Development

UN   United Nations

VC   Venture Capital

WIPO   World Intellectual Property Organization

WTO   World Trade Organization

A.   Science of private equity investments

1.   Introduction

Over the past decades, private equity (PE) has experienced tremendous growth worldwide.[1] At the forefront of this growth have been mature economies, such as those of the United States and the United Kingdom. In these countries, private equity investors have not only invested heavily in their domestic markets, but have also struck cross-border deals.

Given the rising level of globalization, the industry's potential for expansion of cross-border deals is vast. Due to pressure for new investments and high return, more and more investors are branching beyond their traditional, local areas of investment and are integrating themselves into the landscape of the global PE market.

Of course, some countries are better than others for PE investment, particularly those with maturing domestic markets. Also, the quality of the national PE environment largely determines the size and success of that industry in any country. Countries with similar levels of PE activity usually share similar economic and legal characteristics. For example, the United States and the United Kingdom, the two largest PE markets, both have stable regulatory environments, liberal policies toward private enterprise, well-funded financial systems, and an affinity for entrepreneurship.

However, when firms step out of their home country's comfort zone to seek opportunities in foreign markets, they are met with varying degrees of social, cultural, legal, and economic challenges. Furthermore, entering the global market inevitably means that investors will encounter global competition with firms in other countries that may be vying for the same investments.

How do investors weigh foreign market conditions and investment opportunities? To what degree do they try to exploit the similarities and differences of both the source and the host countries? How can global market dynamics and interactions

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[1]   See **EVCA - European Venture Capital Association,** EVCA - Yearbook, 2005-2007; **NVCA - National Venture Capital Association (USA),** National Venture Capital Association Yearbook, Arlington, VA, 1990-2005.

between different countries affect a single deal between the source and host country?

Undeniably, in the cross-border deal history of both early adopter countries and followers lies a wealth of information that reveals patterns and conventions that may be applied to the global cross-border PE market at large. Can relationships between certain countries be easily predicted or replicated? An understanding of the drivers and determinants of transnational investment and their effects on the level of affinity that countries share may shed much-needed light on how and why deals are sourced abroad.

2.   Status quo in private equity research

Despite the attention that PE has received in the financial press, the level of analysis on cross-border activity has been rather limited in most academic literature. Researchers often narrowly evaluate the propensity for PE investment in multiple countries using economic and legal indicators, such as gross domestic product (GDP), capital availability, and judicial regime.[2] In many cases, research tends to be financially oriented, with significant focus on microeconomic topics like fund performance.[3] Even country-specific studies, such as those analyzing foreign direct investment (FDI), do not explicitly mention PE activity.[4] Recent business literature that discusses PE and venture capital (VC) activity cites statistics and studies, the majority of which lack a scientific and comprehensive

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[2]   See **Kumar, V. and Orleck, S.,** Why Does Private Equity Vary Across Countries and Time?, 2002; **Black, B. S.; Gilson, R. J.; McCahery, J. and Renneboog, L.,** Venture Capital and the Structure of Capital Markets: Banks Versus Stock Markets, *Oxford and New York: Oxford University Press*, 2003, pp. 29-59; **Jeng, L. A. and Wells, P. C.,** The Determinants of Venture Capital Funding: Evidence Across Countries, *Journal of Corporate Finance*, 2000, *6*(3), pp. 241-289.

[3]   **Phalippou, L. and Zollo, M.,** What Drives Private Equity Fund Performance?, *University of Amsterdam, Faculty of Economics and Econometrics*, 2005; **Ljungqvist, A. and Richardson, M. P.,** The Cash Flow, Return and Risk Characteristics of Private Equity, *New York University Working Paper*, 2003.

[4]   **Blonigen, B. A.,** A Review of the Empirical Literature on FDI Determinants, *Atlantic Economic Journal*, 2005, *33*(4), pp. 383-395; **Sarisoy Guerin, S.,** The Role of Geography in Financial and Economic Integration: A Comparative Analysis of Foreign Direct Investment, Trade and Portfolio Investment Flows, *World Economy*, 2006, *29*(2), pp. 189-209.

approach.[5] Inevitably, most of this work details only individual stages of VC or PE investment or country-specific problems.

As cross-border PE activity intensifies, what seems to be severely lacking in the bulk of academic research is a comprehensive picture of this cross-country activity and of inter-country relationships. Finally, with PE markets converging into one global playground, a greater understanding of the determinants driving PE deals on a global basis, especially cross-border deals between particular countries, seems mandatory.

3.   Goals and structure of thesis

Given the relative lack of substantive research regarding cross-border PE activity, the general goal of this dissertation is to further an understanding of this area of inquiry by providing a structured and comprehensive approach by which to discuss and assess inter-country PE investment. The research aims to take into account a multitude of factors to identify and explain country-pair affinity. Moreover, from the insights gained in this research, the specific goal is to provide practical and sensible recommendations for the PE praxis.

The basic research question is: What drives countries to develop PE relationships with each other?

To answer this question, the following major roadblocks must first be overcome:

- Limited transparency of cross-border transaction details

- Lack of aggregated PE transaction data on a country level

- Narrow perception of countries as isolated entities

- Lack of analysis that explains the multidimensional dependency of interactions that can arise only between two countries

Scientific examination must be based on an all-encompassing theoretical foundation from which a conceptual framework is developed to empirically analyze cross-border activity. This thesis will develop a methodology that views

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[5]   **Apax Partners,** Unlocking Global Value — Future Trends in Private Equity Investment Worldwide, 2006.

countries as interacting entities with dynamic relationships over time. More specifically, countries will be placed in non-mutually exclusive pairs to recognize their dual roles as investors and as targets.

Additionally, analyzing country pairs statically would be insufficient to understand the market forces affecting cross-border relationships. Adding the element of time to the analysis is essential in gaining insight into the evolution of country relationships.

Finally, determinants will be derived from the conceptual framework to help explain the affinity and strength of PE relations that certain countries have with one another over time.

The general goal of this thesis requires the completion of three sub-goals: description, explanation, and prognosis:

- **Description:** Develop PE conceptual research framework and describe cross-border activity.

  - Define the heterogeneous research subjects, e.g., the participants in the PE market.

  - Organize research subjects by their relation to each other to simplify real-world complexities.

  - Define cross-border activity and develop a method to structure and aggregate deals from firm level to country level over time.

  - Clarify the structure of cross-border deals through analysis of past deals.

  - Derive universal determinants to analyze cross-border activity.

- **Explanation:** Explain why there is affinity between certain countries.

  - Explore the influence (positive or negative) and impact (high or low) each universal determinant has on cross-border activity over time.

- **Prognosis:** Interpret the analytical findings for practical application.

  - Show the influence that country-level determinants have on company strategy.

  - Determine the tendencies of country interaction on a global basis.

  - Note limitations in research and recommend areas for future research in cross-border PE activity.

With these goals clearly outlined, the structure of the thesis is mapped out below.

Figure 1: Structure of thesis


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│            Chapter A: Introduction                │
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│  │         Chapter B: Research concept           │ │
│  │  ┌──────────────────────────────────────────┐│ │
│  │  │   Development of theoretical framework     ││ │
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│  │  │      Design and methods for analysis       ││ │
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│  │  │       Data collection & preparation         ││ │
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│  │         Chapter C: Empirical analysis          │ │
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│  │  │            Descriptive analysis            ││ │
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│  │  │            Statistical analysis            ││ │
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│  │  │             Statistical results             ││ │
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│        Chapter D: Summary and implications         │
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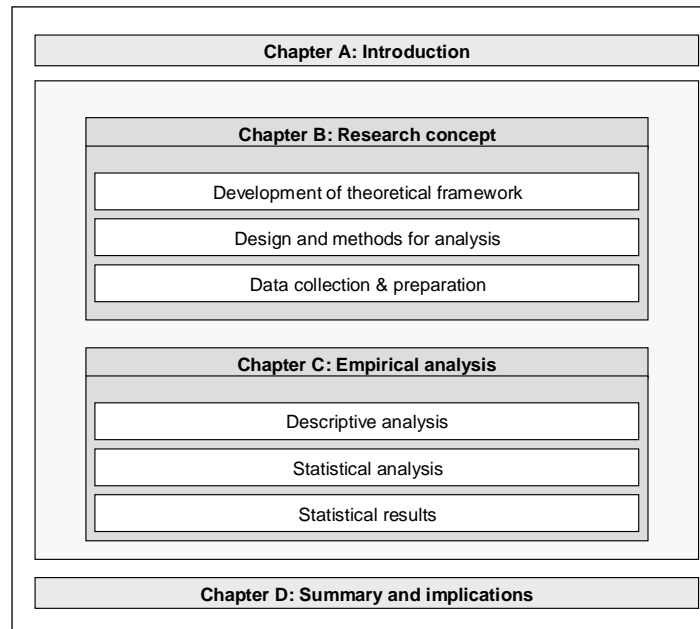
Chapter B begins with an overview of the PE market environment. In addition, descriptions of the life cycle and finance stages of a company and of the business process are provided to further explain the roles of the different PE participants being researched. Previous studies and models are reviewed to establish the theoretical framework on which a viable method of research and statistical analysis must rest. Furthermore, cross-border activity (dependent variable) and its determinants (independent variables) are conceptualized and quantified to ensure the most sensible approach for analytical measurement. Chapter B concludes with a summary of collected data to set the stage for empirical analysis.

Chapter C focuses on the two-part empirical analysis of country activity and its determinants. First, PE activity is systematically described and illustrated to provide insight into cross-border investment patterns and to investigate their underlying norms and rules. The second phase uses statistical analysis to identify determinants that explain the affinity of country pairs in cross-border PE initiatives.

Chapter D summarizes the findings and results of the analysis, and concludes with recommendations for the PE praxis and for future areas of research.

B. Concept for research of private equity investments

1. Developing a theoretical framework

Comparison of previous research studies and heightened community interest in PE reveal the need for a theory-based, empirically proven analysis of the determinants of cross-border investments over time. A theoretical framework to organize and simplify the complexities of reality can be achieved by arranging observations of real phenomena in a statistical model. From this, an hypothesis can be developed and tested. Figure 2 illustrates the research approach.

Figure 2: Research approach
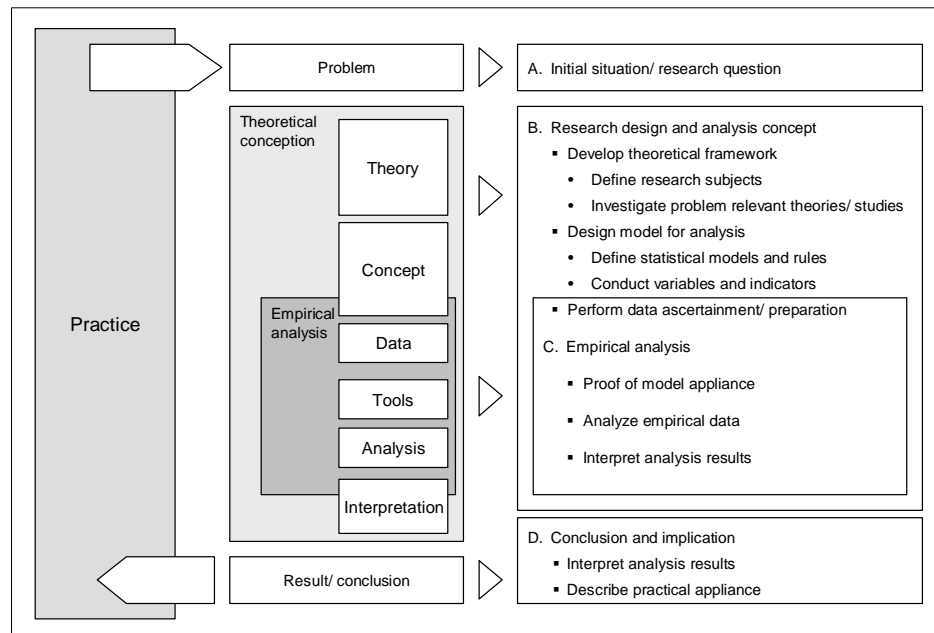
The research question and therefore the thesis is praxis oriented, but on a macroeconomic level. A structured, systematic approach is essential to identify the relevant practical problems and to develop a holistic, theoretical research concept and empirical analysis. For comprehensive scientific research, the subjects must be specified and defined, and the relevant theories identified and organized logically. Such a framework sets the anchor points for the research, finalizes which data are needed, and details the steps for statistical analysis. The empirical results are interpreted and summarized for use by PE practitioners.

1.1. Definition and specifics of the research

The term **private equity** must first be defined because it is used differently in the United States and Europe.[6] Originally, PE investments were defined as investments by institutions or wealthy individuals in companies. Now it is more common that PE refers to a particular stage of development of a company receiving investment. Currently, venture capital (VC) and management and leveraged buyouts are the main types of PE financing. In the United States, PE refers primarily to management and leveraged buyouts, and excludes VC. In the United States, VC consists of three types of early stage financing — seed, startup, and expansion investment — and excludes buyouts. In Europe, VC falls under the umbrella category of PE investment.[7] For the purposes of this research, the following terms will be used in the analysis to accommodate both the American and the European definitions of PE.

A. **Venture capital:** Seed, startup, and expansion investments (United States)

B. **Private equity:** All other stages that are not VC (United States)

C. **Overall private equity investments:** VC and PE (Europe)

To expand the definition of PE beyond an elementary level, it is necessary to examine the economic foundations of the PE market and the institutional structures that support it. First, it is important to describe the overall PE investment market structure and its participants. Second, an overview of the company stages will illustrate the purposes of the PE investment business. Finally, a depiction of the investment process will clarify how PE is executed.

1.1.1. Overall private equity investment market structure

The PE market has three major players, as well as an assortment of minor ones, that interact with each other. Investors, intermediaries (PE companies), and issuers (portfolio (PF) companies) comprise the primary participants. PE firms

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[6] **Bygrave, W. D. and Timmons, J. A.,** Venture Capital at the Crossroads, Boston, 1992; **EVCA - European Venture Capital Association,** EVCA - 2007 Yearbook, 2007; **Kumar and Orleck,** Why Does Private Equity Vary Across Countries and Time?, p. 4; **Jeng and Wells,** The Determinants of Venture Capital Funding: Evidence Across Countries, p. 243.

[7] **BVCA - The British Private Equity and Venture Capital Association,** 2007, www.bvca.co.uk.

pool money from institutional and private investors for their funds to buy and invest in companies. Such companies must generate returns that are higher than the interest paid to the investors. The arrows in Figure 3 show the participation and deal flow between these players. At the bottom are the agents and advisors who help issuers and intermediaries raise money and advise investors.[8]

Figure 3: Private equity market structure
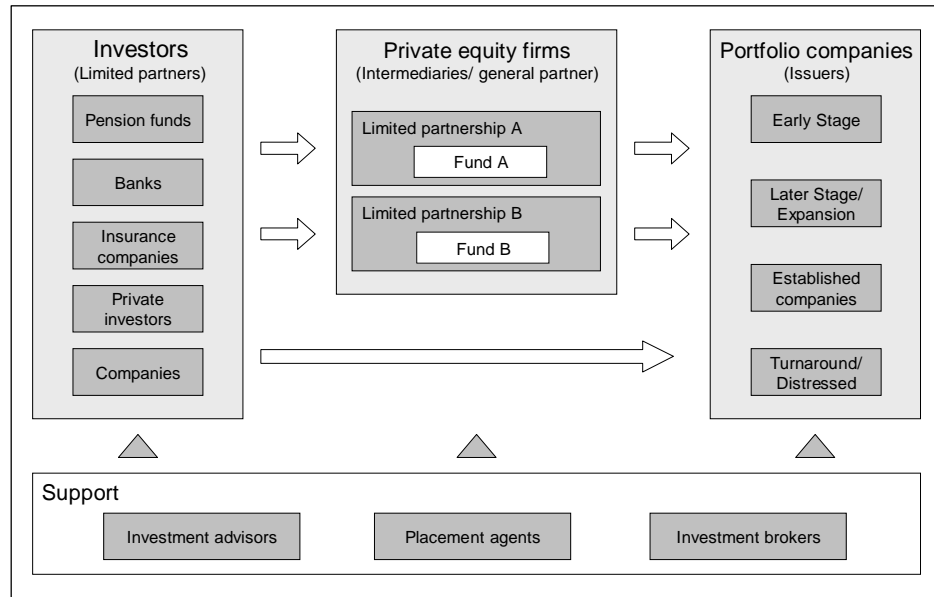
Investors include corporate and public pension funds, banks, wealthy families or individuals, and other investors.

Most institutional investors in the PE market invest strictly to realize financial gain. More specifically, they expect the risk-adjusted return on their PE investments to exceed those that are possible in public equity markets.[9] Bank

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8   **Prowse, S. D.,** The Economics of the Private Equity Market, *Federal Reserve Bank of Dallas Economic Review*, 1998, pp. 21-34; **Fenn, G. W. and Liang, N.,** The Economic of the Private Equity Market, *Federal Reserve Bank of Dallas Economic Review*, 1995; **Phalippou and Zollo,** What Drives Private Equity Fund Performance?, pp. 4 and 18.

9   For discussion of the role of investors, compare: **Hellmann, F. T. and Puri, M.,** The Determinants of Venture Capital Funding: Evidence Across Countries, *Journal of Corporate Finance*, 2001, *6*, pp. 241-289; **Jelic, R.; Saadouni, B. and Wright, M.,** Performance of Private to Public MBOs: The Role of Venture Capital, *Journal of Business Finance & Accounting*, 2005, *32*, pp. 643-682; **Coval, J. and Thakor, A.,** Financial Intermediation as a Beliefs-Bridge Between Optimists and Pessimists, *Journal of Financial Economics*, 2004, *75*, pp. 535-570; **Hellmann, T. and Puri, M.,** The Interaction Between Product Market and

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holding companies, investment banks, and nonfinancial corporations remain active in PE mostly to benefit from economies of scope between PE investing and their core activities.[10] For example, banks are large lenders to small and mid-sized companies. As a result, they are in close contact with many potential PE candidates, and generate opportunities for the firms in which a partnership invests. Nonfinancial investors typically invest in early stage developmental ventures that may fit with their strategic objectives.[11]

Private equity firms are specialized intermediaries, called general partners, that raise money from institutional investors and invest it in publicly and privately held companies. PE firms acquire stakes and take an active role in a company, often exercising as much or more control as a company insider.[12] Under the partnership arrangement, institutional investors are the limited partners and professional PE managers serve as the general partners, and are often associated with a partnership management firm. Some management companies are affiliated with a financial institution, such as an insurance company or investment bank.

Limited partnerships are the major intermediary in the PE market. This is a result of their success in mitigating the severe information problems that exist in the market — both for institutional investors looking for appropriate partnerships in which to invest and for partnerships looking for appropriate PF company investment.[13]

Financial Strategy: The Role of Venture Capital, *Review of Financial Studies*, 2000, *13*, pp. 959-984.

[10] For restrictions and activity, compare: **Hardymon, G. F.; De Nino, M. J. and Salter, M. S.,** When Corporate Venture Capital Doesn't Work., *Harvard Business Review*, 1983, *114*; **Edwards, J. and Fischer, K.,** Banks, Finance and Investment in Germany, *Cambridge University Press*, 1994; **Roe, M. J.,** Political and Legal Restraints on Ownership and Control of Public Companies, *Journal of Financial Economics*, 1990, *27*; **Sahlman, W. A.,** Insights from the American Venture Capital Organizations, *Working Paper*, 1991; **Siegel, R.; Siegel, E. and Mac Millan, I. C.,** Corporate Venture Capitalists: Autonomy, Obstacles, and Performance, *Journal of Business Venturing*, 1988, *3*.

[11] **Prowse,** The Economics of the Private Equity Market.

[12] For a discussion of active investment, see: **Jensen, M. C.,** Presidential Address: The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems, *Journal of Finance*, 1993, *48*.

[13] For the impact of information problems, see: **Toll, D. M.,** Private Equity Partnership Terms and Conditions, Wellesley, Mass., 1999; **Gompers, P. and Lerner, J.,** An Analysis of Compensation in the US Venture Capital Partnership, *Journal of Financial Economics*, 1999,

(cont)

Portfolio companies in the PE market are very diverse, varying widely in size and in their motives for raising capital, but they do share one common characteristic. Because PE is one of the most expensive forms of finance, these firms generally cannot raise financing from the public equity debt markets.[14] A company's finance stages as a main differentiator of PF companies are described in detail in the next chapter.

Supporters: In the PE market is a group of information producers, such as agents, advisors, and brokers, whose role has increased significantly in recent years. These supporters help to place private equity, raise funds for partnerships, and evaluate potential PF companies. They exist because they reduce the costs associated with the information problems that arise in PE investing, especially for disclosure and due diligence.[15]

This description of the PE market structure shows that the initial set of determinants governing the behavior of the PE market directly relate to the financial environment.

Equally important are the determinants for the political or institutional frame, in which the financial environment is of course embedded, that allows or hinders PE activities. This is especially remarkable if there is an absence of PE markets, for example, in heavily regulated securities markets where firms rely on bank financing.[16]

51, pp. 3-44; **Atje, R. and Jovanovic, B.,** Stock Markets and Development, *European Economic Review*, 1993, *37*, pp. 632-640; **Sahlman, W. A.,** The Structure and Governance of Venture Capital Organizations, *Journal of Financial Economics*, 1990, *27*, pp. 473-524; **Gorman, M. and Sahlman, W.,** What Do Venture Capitalists Do?, *Journal of Business Venturing*, 1989, *4*, pp. 231-248.; **Prowse,** The Economics of the Private Equity Market.

[14] **Evans, D. S. and Jovanovich, B.,** An Estimated Model of Entrepreneurial Choice Under Liquidity Constraints, *Journal of Political Economy*, 1998, *97*(4); **Fama, E.,** What is Different about Banks?, *Journal of Monetary Economics*, 1985, *15*; **Mayer, C.,** New Issues in Corporate Finance, *European Economic Review*, 1988, *32*; **Myers, S. and Majluf, N.,** Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have, *Journal of Financial Economics*, 1984, *13*; **Prowse,** The Economics of the Private Equity Market.

[15] **Prowse,** The Economics of the Private Equity Market.

[16] **Prowse,** The Economics of the Private Equity Market.

1.1.2. Private equity finance stages — the company life cycle

Private equity investments are closely related to the life cycle stages of a company. PE firms seem to focus more on company stages than on the industry or any other issuer criterion. The description of the company life cycle provides fundamental insight into the PE finance stages.[17]

Figure 4: The life cycle of a company
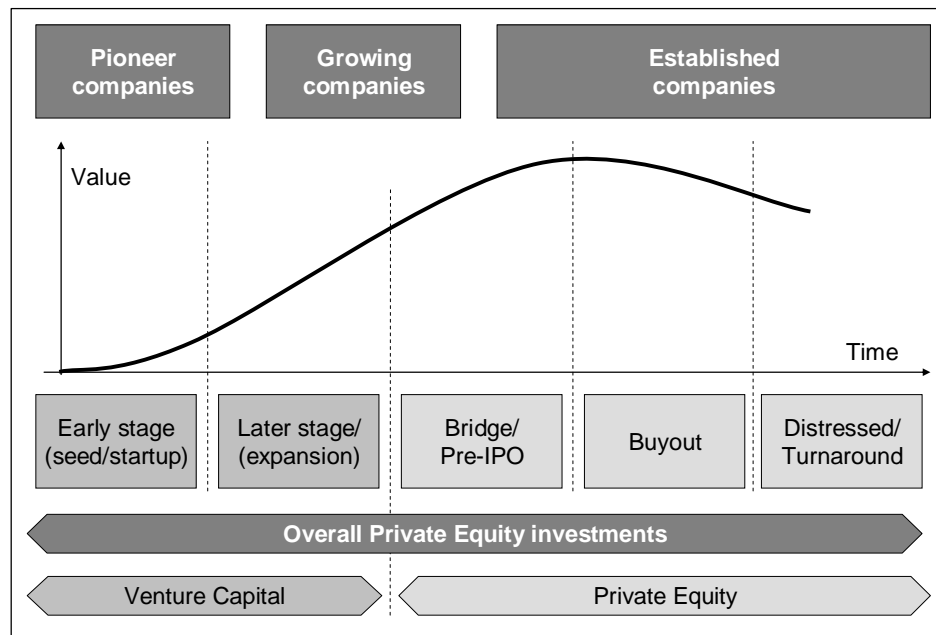
Companies seeking venture capital are traditionally young firms. Most are developing innovative technologies that are predicted to show high growth rates. They may be early stage companies — those still in the research and development stage, or later stage companies — those with several years of sales but still trying to grow rapidly. Many such companies are profitable, established businesses in manufacturing, distribution, and services. They use the PE market to finance growth through new capital expenditures and acquisitions, and to finance changes in capital structure and ownership. Public companies often look

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[17]   **Gompers, P. A.,** Optimal Investment, Monitoring, and the Staging of Venture Capital, *Journal of Finance*, 1995, *50*(5), pp. 1461-1489; **Kaplan, S.; Sensoy, B. A. and Stromberg, P. J.,** What Are Firms? Evolution from Birth to Public Companies, *CEPR Discussion Papers*, 2005, *5224*.

for a combination of debt and PE to finance their management or leveraged buyout. Companies also use PE to help them through periods of financial distress, or to avoid public disclosure.[18]

1.1.3. The private equity investment process

The PE investment process is very structured and can be separated chronologically as shown below in Figure 5. The purpose of the process is to balance the interests of money supply and money demand between investor and PF company.[19]

Figure 5: Private equity investment process

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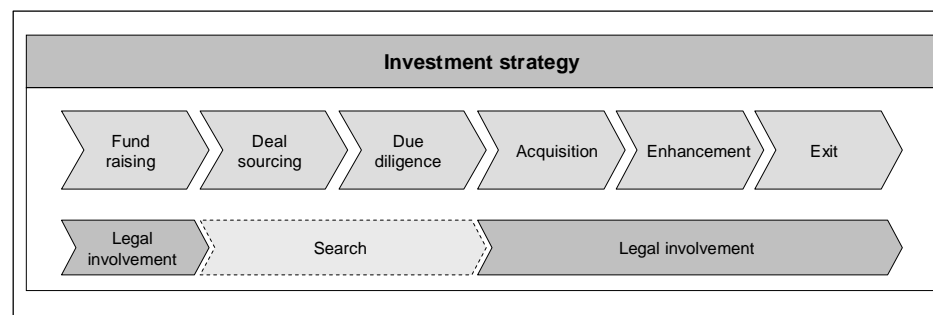
[18] For a discussion of stage investments, see: **Holmes, T. J. and Schmitz, J. A.,** On the Turnover of Business Firms and business Managers, *Journal of Political Economy*, 1995, *103*(5); **Kortum, S. and Lerner, J.,** Assessing the Contribution of Venture Capital to Innovation, 2000; **Pratt, S. P.,** Guide to Venture Capital Sources, Wellesley, Mass.: Captial Publishing, 1981; **Plummer, J. L.,** QED Report on Venture Capital Financial Analysis, Palo Alto: QED Research, 1987; **Ruhnka, J. C. and Young, J. E.,** A Venture Capital Model of the Development Process for New Ventures, *Journal of Business Venturing*, 1987, *2*, pp. 167-184; **Sahlman,** The Structure and Governance of Venture Capital Organizations; **Kraft, V.,** Private Equity in Turnaround Investments, 2001.

[19] **Bygrave and Timmons,** Venture Capital at the Crossroads, p. 14; **Wright, M. and Robbie, K.,** Venture Capital and Private Equity: A Review and Synthesis, *Journal of Business Finance & Accounting*, 1998, *25*(5/6), pp. 521-570; **Fried, V. and Hisrich, R.,** Towards a Model of Venture Capital Investment Decision Making, *Financial Management*, 1994, *24*(3), pp. 28-37; **MacMillan, I. C.; Zemann, L. and Subba Narasimha, P. N.,** Criteria Distinguishing Successful from Unsuccessful Ventures in the Venture Screening Process., *Journal of Business Venturing*, 1987, *2*, pp. 123-137; **Gompers, P. A. and Lerner, J.,** Venture Capital and the Creation of Public Companies: Do Venture Capitalists Really Bring More than Money?, *Journal of Private Equity*, 1997, *1*(1), pp. 15-32; **Gorman and Sahlman,** What Do Venture Capitalists Do?; **Hart, O.,** Financial Contracting, *Working Paper, Harvard University*, 2000; **Kaplan, S. N. and Strömberg, P.,** How Do Venture Capitalists Choose and Manage Their Investments?, *Working Paper, University of Chicago*, 2000; **Kaplan, S. N. and**

(cont)

The process starts with the formulation of an investment strategy that highlights the PE firm's preferences and guides its search for a potential PF company. This strategy forms the entire investment process. Based on the investment strategy, the PE company prepares an offering document outlining its legal structure, fund size, management fees, performance fees, and track record. This documentation is required for fundraising.

After defining the strategy and raising funds, the company identifies potential targets.[20] A PE company is usually embedded in a network of relationships that leads to source deals. Potential target companies are run through a selection process, and those on the short list go through due diligence. Due diligence is essentially an analysis of the economic, operational, and legal facts. It ends with a monetary proposal for value enhancement for the target company. For the acquisition, the PE company enters a commitment to buy shares of the target company. In the value enhancement phase, the PE company is actively involved in the PF company's business, with activities ranging from consulting to financial engineering, and to managing the business operations. The exit phase realizes the enhancement by taking the company public or by selling it to another financial or strategic investor.[21]

The individual steps actually followed depend on the investment strategy. One of the main problems is information asymmetry between the different parties. PE is used in financing situations in which the sorting and incentive problems are

Strömberg, P., Venture Capitalists as Principals: Contracting, Screening, and Monitoring, *NBER Working Paper Cambridge, Mass.*, 2001, *8202*.

[20] **Gupta, A. K. and Sapienza, H.,** Determinants of Venture Capital Firms' Preferences Regarding the Industry Diversity and Geographic Scope of Their Investments., *Journal of Business Venturing*, 1992, *7*(5), pp. 347-362; **Tyebjee, T. and Bruno, A.,** A Model of Venture Capitalist Investment Activity, *Management Science*, 1984, *30*(9), pp. 1051-1066.

[21] **Black; Gilson; McCahery and Renneboog,** Venture Capital Contracting and the Valuation of High-technology Firms; **Cumming, D. J. and MacIntosh, J. G.,** A Cross-Country Comparison of Full and Partial Venture Capital Exits, *Journal of Banking & Finance*, 2003, *27*(3), pp. 511-515; **Giot, P. and Schwienbacher, A.,** IPOs, Trade Sales and Liquidations: Modelling Venture Capital Exits Using Survival Analysis, *Journal of Banking & Finance*, 2007, *31*(3), pp. 679-702; **Schwienbacher, A.,** Innovation and Venture Capital Exits, *Working Paper University of Amsterdam*, 2003; **Barry, C.,** New Directions in Research on Venture Capital Finance, *Financial Management*, 1994, *23*(3), pp. 3-15; **Bascha, A. and Walz, U.,** Convertible Securities and Optimal Exit Decisions in Venture Capital Finance, *Journal of Corporate Finance*, 2001, *7*(3), pp. 285-306; **Lerner, J.,** Venture Capitalists and the Decision to Go Public, *Journal of Financial Economics*, 1994, *35*(3), pp. 293-316; **Ritter, J.,** Initial Public Offerings, *Contemporary Finance Digest*, 1998, *2*(1).

especially severe. Resolving these problems requires that investors engage in intensive pre-investment due diligence and post-investment monitoring.[22]

1.2. Relevant research studies and models

To develop a suitable framework with which to analyze cross-border PE activity over time, a variety of relevant scientific approaches must first be assessed. These approaches can be found in both topic-related and method-related studies. Topic-related studies are those that typically focus on the particular subject of PE or VC. Method-related studies, which ideally confine analysis to country investment flows, focus on cross-border activity and country time series.

1.2.1. Topic-related private equity and venture capital studies

The topic-related approach screens relevant PE investment studies to find those PE and VC studies that are ideally confined to scientific country studies. The focus of search is on academic literature and scientific research papers, and universities with professorships supplemented by research topics on the institutions, associations, and reports of PE investors. The most relevant and recent ones are extracted.

Josh Lerner and Paul Gompers, of Harvard University, have done extensive research on VC and PE. Some of their recent titles are "The Venture Capital Revolution," "Venture Capital and Private Equity: A Course Overview," "Money Chasing Deals?: The Impact of Fund Inflows on the Valuation of Private Equity Investments." Other scientific studies are "Why Does Private Equity Vary Across Countries and Time?"[23] and "Explaining Variations in Private Equity: A Panel

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[22] **Myers and Majluf,** Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have; **Levin, J.,** Structuring Venture Capital, Private Equity and Entrepreneurial Transactions, New York, 1998; **Ljungqvist, A. and Richardson, M. P.,** The Investment Behavior of Private Equity Fund Managers, *New York University Working Paper*, 2003; **Prowse,** The Economics of the Private Equity Market, p. 28; **Cumming, D. J.,** Agency Costs, Institutions, Learning, and Taxation in Venture Capital Contracting, *Journal of Business Venturing*, 2005, *20*(5), pp. 573-578; **Wright, M.; Thompson, S. and Robbie, K.,** Venture Capital and Management Led Leveraged Buyouts: A European Perspective, *Journal of Business Venturing*, 1992, *7*, pp. 47-71.

[23] **Kumar and Orleck,** Why Does Private Equity Vary Across Countries and Time?

Approach."[24] Most of the reviewed empirical studies[25] have analyzed VC, PE (and FDI) topics using economic time-series data or cross-sectional data provided by economic databases. A few more practical studies use surveys as a data set source.[26] These studies are used as guidance for the criteria derived in this paper.

1.2.2. Method-related studies: Time series and cross-section

When analyzing countries over time and in relation to each other, the academic literature employs two main methods. **Panel data analysis**[27] combines time series and cross-sections to analyze repeated observations on fixed units. The **gravity model**[28] has been used to investigate cross-border transactions of trade flows[29] and, more recently, investment flows.[30]

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[24] **Leachman, L.; Kumar, V. and Orleck, S.,** Explaining Variations in Private Equity: A Panel Approach, *Duke University, Department of Economics, Working Papers*, 2002, *02-14*.

[25] See also: **Cumming, D. and Walz, U.,** Private Equity Returns and Disclosure Around the World, *University of Alberta and University of Frankfurt*, 2004; **Gao, T.,** Foreign Direct Investment in China: How Big Are the Roles of Culture and Geography?, *Pacific Economic Review*, 2005, *10*(2), pp. 153-166; **Baygan, G. and Freudenberg, M.,** The Internationalisation of Venture Capital Activity in OECD Countries: Implications for Measurement and Policy, *STI Working Paper 2000/7 OECD*, 2000; **Helpmann, E.,** The Structure of Foreign Trade, *Journal of Economic Perspectives*, 1999, *13*(2), pp. 121-144; **Messica, A. and Agmon, T.,** Temporal Comparative Analysis of the US Venture Capital Industry Over 1980 to 2002, *Holon Institute of Technology Working Paper Series*, 2006; **Schertler, A.,** Driving Forces of Venture Capital Investments in Europe - A Dynamic Panel Analysis, *United Nations University, Institute for New Technologies*, 2003, *Technology and Finance Working Papers*(23).

[26] **Kraft,** Private Equity in Turnaround Investments; **Bottazzi, L.; Da Rin, M. and Hellmann, T.,** The Changing Face of the European Venture Capital Industry: Facts and Analysis, *Journal of Private Equity*, 2004, *7*(2), pp. 26-53.

[27] **Wooldridge, J. M.,** Econometric Analysis of Cross Section and Panel Data, Cambridge, Mass.: MIT Press, 2002; **Greene, W. H.,** Econometric Analysis, Upper Saddle River, N.J.: Prentice Hall, 2003.

[28] **Tinbergen, J.,** Shaping the World Economy, *International Executive*, 1963, *5*(1), pp. 27-30; **Matyas, L.,** Proper Econometric Specification of the Gravity Model, *World Economy*, 1997, *20*(3), pp. 363-369.

[29] **Josselin, D. and Nicot, B.,** A Geo-Economic Gravity of Trade for European Union, *Gybergeo: Revue Europeenne de Geographie*, 2003(237); **Linnemann, H.,** An Econometric Study of International Trade Flows, *Thesis*, 1966, pp. 1-234; **Rose, A.,** Which International Institutions Promote International Trade?, *Review of International Economics*, 2005, *13*(4), pp. 682-685; **Glick, R. and Rose, A. K.,** Does a Currency Union Affect trade? The Time-Series Evidence, *European Economic Review*, 2002, *46*(6), pp. 1125-1130; **SimTrade,** A Gravity Model for the Calculation of Trade Potentials for Developing Countries and Countries in Transition, *Discussion paper, UNCTAD/WTO, International Trade Center*, 2003;

The panel data analysis — also known as longitudinal data or cross-sectional time series — is very common in economics and provides a rich environment for the development of estimation techniques and theoretical results. Many studies have analyzed panel data sets. Among the best known are the National Longitudinal Survey of Income Dynamics[31] and the Michigan Panel Study of Income Dynamics.[32] Other empirical studies have analyzed time-series data on sets of states, countries, or industries simultaneously. Intensive theoretical examination of the panel data analysis has been done, for example, by William H. Greene[33] and Jeffrey M. Wooldridge.[34]

Gravity models were originally used to explain bilateral trade flows between countries using Newton's law of gravitation as an analogy.[35] Gravitation comes from the attraction of two masses; distance reduces this effect. Applied to bilateral trade flows of countries, the forces of attraction are represented by the size of the economies, while distance is illustrated by the geographical and economic distance — more generally, the transaction costs. The gravity model has become one of the most successful tools for estimating the characteristics of bilateral trade relations because the model has established its theoretical

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Helpmann, The Structure of Foreign Trade; **Harris, M. N. and Matyas, L.,** Modelling Export Flows in the APEC Region: Static and Dynamic Gravity Model Approaches, *Asia Pacific Journal of Economics and Business*, 2001, *5*(1), pp. 97-118; **Serlenga, L. and Shin, Y.,** Gravity Models of the Intra-EU Trade: Application of the Hausman-Taylor Estimation in Heterogeneous Panels with Common Time-Specific Factors, *ESE Discussion Paper University of Edinburgh, School of Economics*, 2004, *105*.

[30] **Rose, A. K. and Spiegel, M. M.,** Offshore Financial Centers: Parasites or Symbionts?, *The Economic Journal*, 2007, *117*(523), pp. 1310-1314; **Di Mauro, F.,** The Impact of Economic Integration on FDI and Exports: A Gravity Approach, *CEPS Working Document*, 2000(156); **Buch, C. and Piazolo, D.,** Capital Trade Flows in Europe and the Impact of Enlargement, *Kiel University Working Paper*, 2000, *1001*; **De Mello Sampayo, F.,** The Location of the United States' FDI under the Share Gravity Model, *Discussion Paper University of Birmingham*, 2000, *00-04*.

[31] **U.S. Department of Labor- Bureau of Labor Statistics** National Longitudinal Survey of Income Dynamics.

[32] **University of Michigan,** Michigan Panel Study of Income Dynamics.

[33] **Greene,** Econometric Analysis, p. 283.

[34] **Wooldridge,** Econometric Analysis of Cross Section and Panel Data.

[35] **Bergstrand, J.,** The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence, *The Review of Economics and Statistics*, 1985, *67(3)*, pp. 474-481; **Isard, W.,** Location Theory and Trade Theory: Short-Run Analysis, *Quarterly Journal of Economics*, 1954, *68*, pp. 305- 322.

foundations, and recent specifications are in line with current econometric literature.[36]

The model has been widely used by institutions like the World Bank, the World Trade Organization (WTO), and central banks to model international relations, test trade agreements, and evaluate investment flows. Recent academic research[37] has been done, for example, to model export potential,[38] foreign direct investment,[39] and the impact of global financial centers.[40] Intensive theoretical research has been done on the model, for example, by Laszlo Matyas,[41] Michael Pfaffermayr and Peter Egger,[42] and Badi H. Baltagi.[43]

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[36]   **Baltagi, B. H.; Egger, P. and Pfaffermayr, M.,** A Generalized Design for Bilateral Trade Flow Models, *Elsevier*, 2003; **Matyas, L.,** The Gravity Model: Some Econometric Considerations, *World Economy*, 1998, *21*(3), pp. 397-402; **Matyas,** Proper Econometric Specification of the Gravity Model; **Egger, P.,** An Econometric View on the Estimation of Gravity Models and the Calculation of Trade Potentials, *The World Economy*, 2002, *25*(2), pp. 297-299; **Greene, W.; Harris, M. N. and Matyas, L.,** Gravity Models, Zero Trade Flows and Fixed Effects, 2006; **Ruiz, J. M. and Vilarrubia, J. M.,** The Wise Use of Dummies in Gravity Models: Export Potentials in the Euromed Region, *Banco de Espana, Eurosistema*, 2007.

[37]   For further research specific to the trade flow theories of Hekscher, Ohlin and Samuelson (HOS) and New Trade Theory (NTT), compare: **Egger, P. and Pfaffermayr, M.,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects, *Empirical Economics*, 2003, *28*(3), pp. 571-580; **Bergstrand, J. H.,** The Heckscher-Ohlin-Samuelson Model, the Linder Hypothesis and the Determinants of Bilateral Intra-Industry Trade, *The Economic Journal*, 1990, *100*(403), pp. 1216-1234; **Ghosh, S. and Yamarik, S.,** Are Regional Trading Arrangements Trade Creating? An Application of Extreme Bounds Analysis, *Journal of International Economics*, 2004, *63*(2), pp. 369-395; **Helpmann, E. and Krugmann, P. R.,** Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition and the International Economy, *MIT Press, Cambridge, MA*, 1985; **Hummels, D. and Levinsohn, J.,** Monopolistic Competition and International Trade: Reconsidering the Evidence, *Quarterly Journal of Economics*, 1995, *110*(3), pp. 799-837; **Krugmann, P. R.,** Scale Economies, Product Differentiation, and the Pattern of Trade., *American Economic Review*, 1980, *70*, pp. 950-959; **Linder, S. B.,** An Essay OnTrade and Transformation, New York: John Wiley, 1961.

[38]   **Baltagi; Egger and Pfaffermayr,** A Generalized Design for Bilateral Trade Flow Models.

[39]   **Borrmann, C.; Jungnickel, R. and Keller, D.,** What Gravity Models Can Tell Us About the Position of German FDI in Central and Eastern Europe, *HWWA DISCUSSION PAPER*, 2005; **Baltagi, B. H.; Peter, E. and Michael, P.,** Estimating Models of Complex FDI: Are There Third-Country Effects?, *Journal of Econometrics*, 2007, *140*(1), pp. 260-265; **Noguer, M. and Canals, C.,** The Determinants of Cross-Border Investment: A Value-Chain Analysis, *La Caixa' Working Paper*, 2007, *No. 05/2006*.

[40]   **Rose and Spiegel,** Offshore Financial Centers: Parasites or Symbionts?

[41]   **Matyas,** The Gravity Model: Some Econometric Considerations.

[42]   **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects.

[43]   **Baltagi; Egger and Pfaffermayr,** A Generalized Design for Bilateral Trade Flow Models.

Detailed explanation of the models appears in Chapter B.2.2. of this paper, in the analysis design section.

2.   Design and method of analysis

The previous section 1 described the research topic from a theoretical standpoint. However, to answer the research question posed in the beginning, the theoretical findings must be structured. A multidimensional framework is developed to conceptualize the research goals and to set up an applicable empirical framework to identify and explain PE investment patterns between countries. Real-life information must be configured into defined observable empirical objects. This determines the object's position in the framework. Seeing how the objects relate to each other helps to clarify, define, and quantify PE activity. This conceptual frame supports the identification and derivation of explanatory variables for statistical analysis.

Analyzing cross-border activity sets the foundation for research. The methods (Chapter 1.2.2.) set the frame. The relevant research studies (Chapters 1.1. and 1.2.1.) support the design with key findings.

2.1.   Design of the analysis

The analytic design strictly follows the research goals. The following graph shows the initial research area (I) and visualizes reality expressed as an abstract statistical model.

Figure 6: Framework for research design
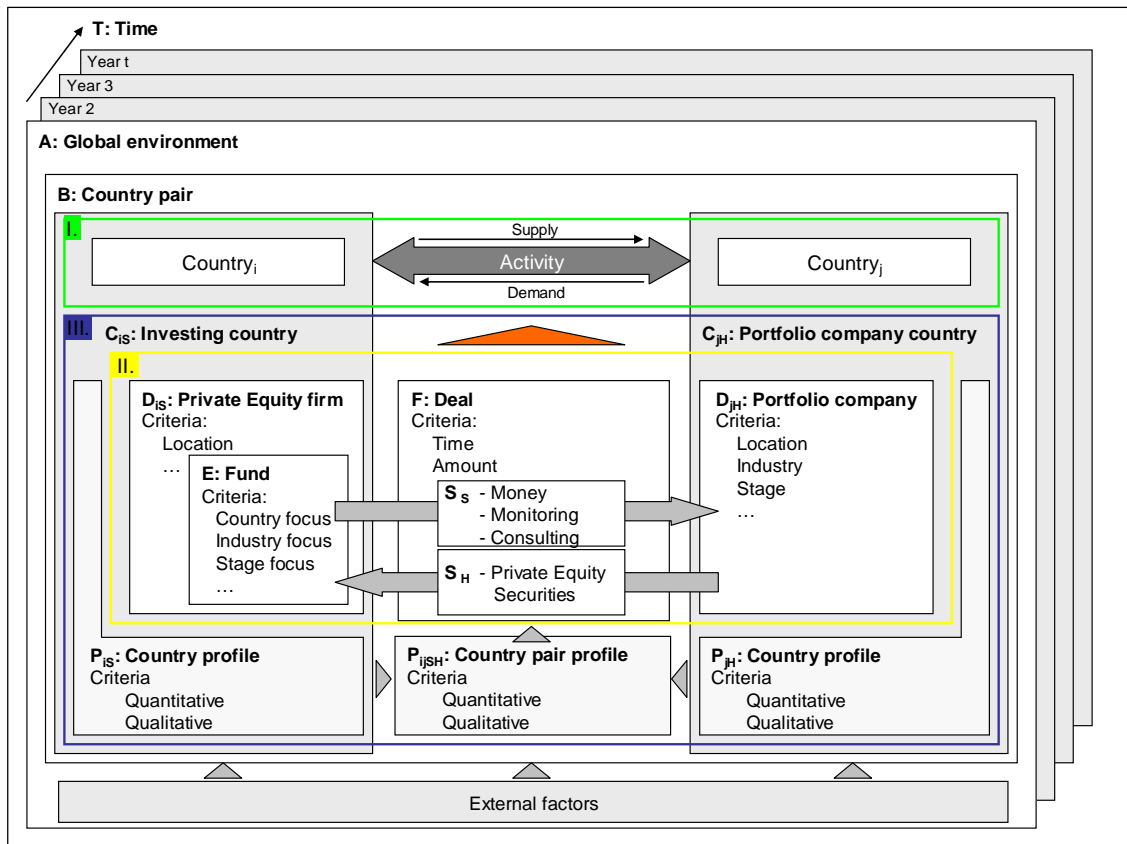
The frame has essentially two dimensions — time and country — and is arranged in layers with nested objects. The basic layer is the global environment (A) with countries (C) for a fixed time period (T). Each layer (A) covers one time period. The initial research outline (I) of cross-border activity shows the balance of supply and demand between Country$_i$ and Country$_j$, and spans further dimensions within this layer by setting countries in relation to each other. This three-dimensional model of a country pair — Country$_i$ to Country$_j$ over Year$_t$ is the basis of the theoretical model and reflects the starting point of the research. Beneath the research model (I) is the schemed model of reality (II), which illustrates the observable objects and the relations between PE firms and PF companies to structure and quantify cross-border activity. The third frame (III) illustrates country-related factors that determine country activity.

The core is the model of reality (II) that structures the investment of a PE firm to a PF company. The physical objects are PE firm (D_i) and portfolio company (D_j),

with fund (E) nested into the PE firm (D_i). Deal (F) is a construct that relates the funds of the PE firm to the PF company.

Each object has unique criteria, important for this specific analysis. The PE firm is defined by location (country) and through its funds, with special focus on, e.g., company stage, industry, or particular region. The PF company is characterized by industry, location (country), and current stage. So far, PE firm and PF company are separate, static entities with no relation to each other. PE firms and PF companies could be placed into the frame by country of origin. But anchoring the objects by geographical location disturbs the analysis of supply and demand between countries. The definition of *country*, therefore, has to be refined to include its investment perspective, which is described in detail below.

In the global environment frame (A) the former static objects of countries, PE firms, and companies are linked to each other through the construct **Deal** (F). In this frame, the Deal (F) is designed as a separate observable entity with consolidated criteria of the PE firm and the portfolio company, uniquely defining an activity between companies. The deal in this case is characterized and defined through the participants — the PE firm and the PF company — and a set of goods and services for each participant (S_s, S_H) that is transferred between them at a certain point in time for a certain amount of money.

All the activity between the PE firm and PF company is described by the flow of goods and services in both directions. To differentiate between the geographical location and the location of investment, the country of the PE firm is defined as the investing country (C_{iS}), or the source country of investment, and the country of the PF company is defined as PF company country (C_{jH}) or host country. This means that a geographical country can be both source (C_S) and host (C_H) country of investment, for example, United States$_S$ and United States$_H$. In other words, if the source country is the same as the host country it is a domestic deal, and if they are different it is a cross-border deal.

The source-host combination is a country pair (B), an independent observable object at a certain point in time nested in the global environment (A). This shows that neither the PE firm nor the PF company is a sufficient observable object. It is the deal itself that comprises the three dimensions of source location, host location, and time, and places all necessary objects into the frame to quantify PE activity.

The third frame (III) illustrates how quantitative and qualitative data of the geographical country align with the source and host country perspective through the country pair combination. This is described in detail using actual data in Chapter 2.3.2. External factors, e.g., the influence of third countries, are included for methodological completeness.

2.2. Statistical methods for analysis

The modeling of the observations calls for some complex statistical calculations to analyze the combined dimensions of source, host, and time. The analytical methods must reflect the requirements of the data set. As described in Chapter 1.2., the two main methods — panel data analysis and gravity model analysis — fill those requirements and can be linked to the framework.

Figure 7: Alignment of analytical methods with theoretical framework
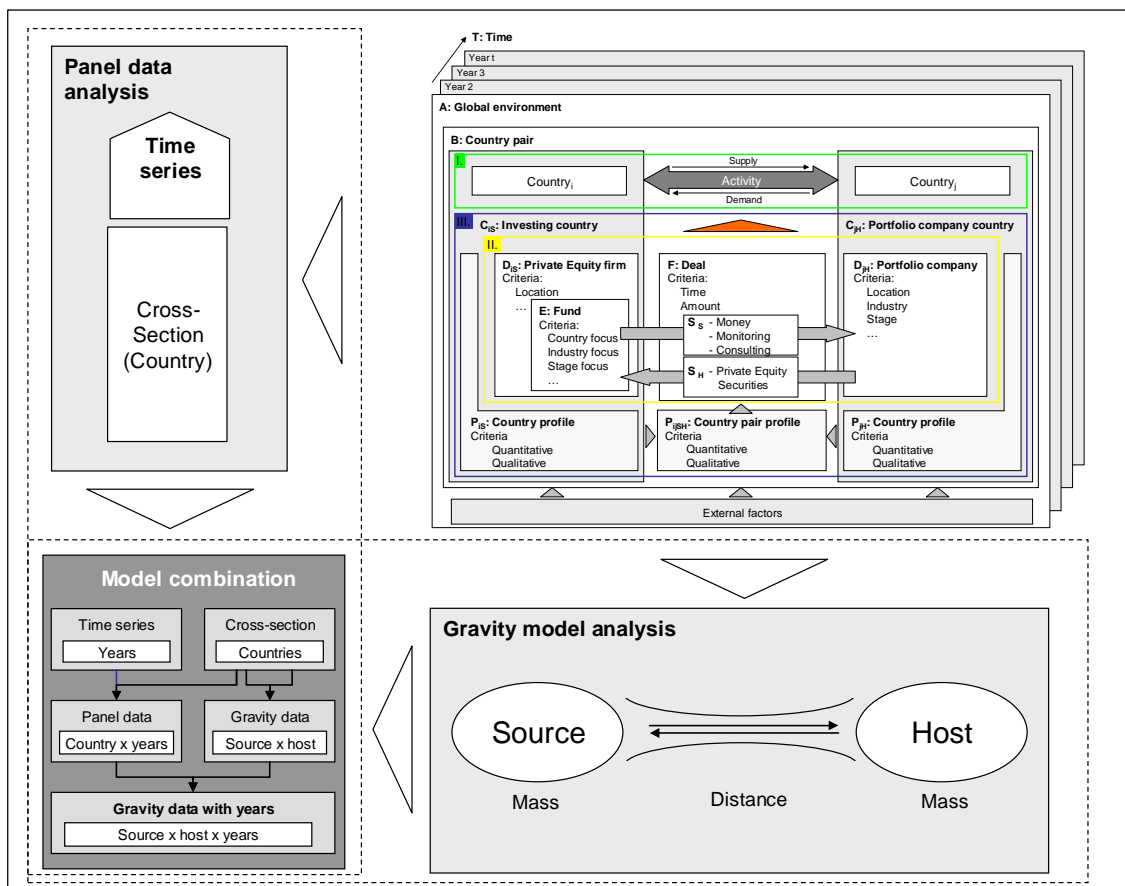
The graph shows the framework from Chapter 2.1. with the three dimensions of source, host country, and time. To the left is the schematic of the panel data analysis, with countries as cross-section and years as a time series. At the bottom is the country pair combination translated into the gravity model with source/host country. The model combination creates the analytical path to the final data constellation for the statistical analysis — the gravity model analysis with time dimensions.

2.2.1. Panel data analysis

The panel data analysis fills fundamental requirements for the gravity model. Panel data analysis is one of the most active and innovative categories in econometrics and provides a rich environment for estimation techniques and theoretical results.[44] Panel data combine cross-section and time series. Multiple cases (N) are observed over time periods (T) resulting in N x T observations. The data set is a vector of observations with the form x_{it}, with i for unit and t for time. In this case, country i with a temporal reference t (here, the year). The model predicts output y through subject-specific time variables x. Two types of information are in this data: cross-sectional information, reflected in the differences between subjects, and the time series, or within-subject information, reflected in the change within subjects over time.

Panel data analysis allows using time-series cross-sectional data to examine issues that could not be studied in either cross-sectional or time-series settings alone.[45] A general advantage of panel data analysis is that it is possible to deconstruct the independent variable into two components — within-group and between-group variances. The within-group estimator uses the time variation *within* each cross-section, and the between-group estimator uses the variation

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[44] **Baltagi, B. H.,** Econometric Analysis of Panel Data, Chichester; New York: Wiley, 1995; **Davidson, R. and MacKinnon, J. G.,** Estimation and Inference in Econometrics, *Oxford University Press*, 1993, pp. 320-323; **Gujarat, D.,** Basic Econometrics, New York, 2003; **Sayrs, L.,** Pooled Time Series Analysis, Newbury Park, CA, 1989; **Wooldridge,** Econometric Analysis of Cross Section and Panel Data **Stata Corporation.,** Longitudinal/Panel data, College Station, Tex.: Stata Press, 2005.

[45] **Greene,** Econometric Analysis, p. 284.

between the cross-section observations.[46] The basic framework for the panel data analysis is a regression model that takes the following form:

Equation 1: Basic panel data analysis model

$$y_{it} = \alpha_i + \beta\, x_{it} + \varepsilon_{it} \qquad\qquad i = 1,2,3,...,N \qquad\qquad t = 1,2,3,...,T$$

where: x = regressor or independent variables, y = regressand or dependent variable, α = intercept, β = slope and ε = the residual or error term. The variables y_{it} and x_{it}, and the residual ε_{it} have two dimensions; the intercept α_i has one dimension. The model predicts the output y through country-specific variables (x) that vary over time, for example, population or gross domestic product (GDP).

Several types of analytic panel data models exist. Pooled regression models, fixed effects models, and random effects models. Among these are dynamic panel, robust, and covariance structure models.[47] Heterogeneity, also known as individual effect[48] across units, is integral to and often the central focus of such analysis.

The panel data analysis models (pooled, fixed, or random effect) differ in their assumptions of the individual effect (heterogeneity) of the subjects. Individual or group-specific variables can either be observed, such as location, or unobserved, such as country-specific characteristics. The variables can vary or be constant over time.[49] Substituting α_i in the previous regression Equation 1 with $z_i\alpha$, the heterogeneity is $z_i\alpha$, where z_i contains a constant term and a set of individual or group-specific variables. If the set of variables is constant over time t, this is a classic regression model. If z_i is observed for all individuals, then the entire model can be treated as an ordinary linear model fit by least squares.[50]

Pooled regression model: If z_i contains only a constant term with neither significant individual country nor temporal effects, then the ordinary least squares

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[46] **Wooldridge,** Econometric Analysis of Cross Section and Panel Data, p. 268.
[47] **Mundlak, Y.,** On the Pooling of Time Series and Cross Section Data, *Econometrica*, 1978, *46*(1), pp. 69-85; **Greene,** Econometric Analysis, p. 283.
[48] Individual effect; the quality of being diverse and not comparable in kind; **Greene,** Econometric Analysis, p. 285.
[49] **Greene,** Econometric Analysis, p. 283.
[50] **Greene,** Econometric Analysis, p. 285.

provides consistent and efficient estimates of α and β. This model has constant coefficients referring to the intercepts and slopes.[51]

Fixed effects: The fixed effect approach takes α_i to be a group-specific constant term in the regression model, with z_i unobserved but correlated to x_{it}. The model has constant slopes β, but intercepts α_i differ according to the cross-sectional group, in this case the country. This formulation assumes that there are country-specific effects but no significant temporal effects, and that differences across units can be captured in differences in the constant term.[52]

Random effects: If the unobserved individual heterogeneity can be assumed to be uncorrelated with the included variables, then the model is a linear regression with a compound disturbance that may be consistently estimated by least squares.

Equation 2: Random effects model

$$y_{it} = \alpha_i + u_i + \beta\, x_{it} + \varepsilon_{it}$$

The random effect specifies that u_i is a group-specific random constant term that enters the regression identically in each period. The random effect model allows for time and country effects.

The crucial distinction between the models of fixed and random effects is whether or not the unobserved individual effect embodies elements that are correlated with the regressors in the model.[53] The classic **specification tests**[54] — whether the fixed or random effects model should be used — are:

1. Hausman's specification test for the random effects model[55]

2. Breusch-Pagan Lagrange multiplier test for random effects[56]

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[51] **Greene,** Econometric Analysis, p. 285.
[52] **Greene,** Econometric Analysis, p. 285.
[53] **Greene,** Econometric Analysis, p. 285; **Wooldridge,** Econometric Analysis of Cross Section and Panel Data, p. 252.
[54] **Baltagi, B. H.; Bresson, G. and Pirotte, A.,** Fixed Effects, Random Effects or Hausman Taylor?: A Pretest Estimator, *Economics Letters*, 2003, *79*(3), pp. 361-369; **Wooldridge,** Econometric Analysis of Cross Section and Panel Data, p. 251.
[55] **Hausman, J. A.,** Specification Tests in Econometrics, *Econometrica*, 1978, *46*, pp. 1251-1271; **Greene,** Econometric Analysis, p. 301.

Statistically, the fixed effects model is reasonable for panel data analysis, but it may not be the most efficient model to run. If there is no correlation between the unobserved effects, the random effects model may be the more powerful model. Otherwise, the random effects model would have inconsistent results and the fixed effects model would be the model of choice.

In-depth fixed-effect model approach

The focus of this thesis is on the fixed model approach as the main technique for panel data analysis, taking into account the gravity-model approach and after testing for the most efficient model for the specific analysis of this paper.[57]

As described in the fixed model approach, each α_i is treated as an unknown parameter to be estimated. If differences across groups are of interest, the hypothesis that the constant terms are all equal can be tested with an F-test.[58]

Without further assumptions, time-constant factors cannot be included in x_{it}, because if z_i can be correlated with each element of x_{it}, there is no possibility to distinguish the effects of time-constant observables from the time-constant unobservable α_i.[59] In panel data analysis, the term "time-varying explanatory variables" means that each element of x_{it} varies over time for some cross-section units.[60]

The fixed effect model is referred to as the **least squares dummy variable** (LSDV) model, because the group effects can be estimated alternatively with a constant term and $i-1$ dummy variables to designate a particular group, in this case, country. All results will be unchanged, but rather than estimate α_i, each dummy variable coefficient will now be an estimate of $\alpha_i - \alpha_1$, where group one is the omitted group.[61] The LSDV approach can be used to include a time-specific

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[56]   **Breusch, T. and Pagan, A.,** The LM Test and Its Applications to Model Specification in Econometrics, *Review of Economic Studies*, 1980, *47*, pp. 239-254; **Greene,** Econometric Analysis, p. 298; **Wooldridge,** Econometric Analysis of Cross Section and Panel Data, p. 264.

[57]   **Greene,** Econometric Analysis, p. 298.

[58]   **Greene,** Econometric Analysis, p. 289.

[59]   **Wooldridge,** Econometric Analysis of Cross Section and Panel Data, p. 266.

[60]   **Wooldridge,** Econometric Analysis of Cross Section and Panel Data, p. 266; **Hausman, J. A. and Taylor, W. E.,** Panel Data and Unobservable Individual Effects, *Journal of Econometrics*, 1981, *16*(1), pp. 155-156; **Hsiao, C.,** Analysis of Panel Data, *Cambridge University Press*, 1986.

[61]   **Greene,** Econometric Analysis, p. 289.

effect as well. A general specification to extend the model is to add the time effect by $T-1$ dummy variables for the years.

Equation 3: Fixed effect model with time effect

$$y_{it} = \alpha_i + \gamma_t + \beta\, x_{it} + \varepsilon_{it}$$

The differences between units can be modeled as parametric shifts of the regression function.[62]

Fixed effect hypothesis testing

Using the pooled regression model as a base, the results of the fixed effect model can be tested for group, time, and interaction effects hierarchically. As already pointed out, if there is no significant variation across countries, then there is no need for a fixed effects model.

If the **group effect** is tested under the null hypothesis of equality of the constant term, the efficient estimator is then pooled least squares. The significant test is the F-test with the following F-ratio:

Equation 4: Group effect estimation

$$F_{groupeffects} = \frac{(R^2_{LSDV} - R^2_{Pooled})/(n-1)}{(1 - R^2_{LSDV})(nT - nK)}$$

with F = total number of temporal observations, n = number of groups, and k = number of regressors in the model. $Pooled$ indicates the pooled restricted model, with only a single overall constant term, and $LSDV$ indicates the least squares dummy variable model.[63]

The **time effect** can be tested by a contrast as comparison to a base period using the one that is excluded as a reference.[64] With the assumption that the sum of the time effects is equal to zero, the contrast is paired t-test between the reference and the rest value with the equation:

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[62] **Greene,** Econometric Analysis, p. 291; **Wooldridge,** Econometric Analysis of Cross Section and Panel Data, p. 273; **Baltagi,** Econometric Analysis of Panel Data.

[63] **Wooldridge,** Econometric Analysis of Cross Section and Panel Data; **Greene,** Econometric Analysis, p. 289.

[64] **Greene,** Econometric Analysis, p. 291.

Equation 5: Time effects

$$y_{it} = \alpha_i + \gamma_t + \beta\, x_{it} + \varepsilon_{it}$$

where the group effects are α_i and time effects are γ_t.

For **fixed time** and **group effects**, least squares estimates can be obtained by a model in this form:

Equation 6: Fixed time and group effects

$$y_{it} = \alpha_i + \gamma_t + \mu + \beta\, x_{it} + \varepsilon_{it}$$

with full n and T effects included with μ as an overall constant term, and the restriction that the **sum of time effects** and the **sum of country effects** of each is zero, the least squares estimates of the slopes in the model can be obtained by the regressions of:

Equation 7: Least squares estimates of slopes

$$y_{*it} = y_{it} - \bar{y}_{i.} - \bar{y}_{.t} + \bar{\bar{y}} \qquad \text{on} \qquad x_{*it} = x_{it} - \bar{x}_{i.} - \bar{x}_{.t} + \bar{\bar{x}}$$

where the period specific and the overall means are:

Equation 8: Period specific and overall means

$$\bar{y}_{.t} = \frac{1}{n}\sum_{i=1}^{n} y_{it} \qquad \text{and} \qquad \bar{\bar{y}} = \frac{1}{nT}\sum_{i=1}^{n}\sum_{t=1}^{T} y_{it}$$

for the regressand and likewise for the regressors $\bar{x}_{.t}$ and $\bar{x}$. Then the overall constant and the dummy variable coefficients for country and time can be recovered as:

Equation 9: Overall constant and dummy variable coefficients

Overall constant: $\hat{\mu} = \bar{\bar{y}} - \bar{\bar{x}}b$

Country effect: $\hat{\alpha}_i = (\bar{y}_{i.} - \bar{\bar{y}}) - (\bar{x}_{i.} - \bar{\bar{x}})b$

Year effect: $\hat{y}_t = (\bar{y}_{.t} - \bar{\bar{y}}) - (\bar{x}_{.t} - \bar{\bar{x}})b$

The equations describe the methods needed for the models used here.[65]

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[65]   **Greene,** Econometric Analysis, p. 291.

For panel data analysis a number of restrictions that have to be considered if the panels are unbalanced[66] have autocorrelation, or heteroscedasticity. A panel is unbalanced if the matrix N x T, with N cases and T periods, has gaps in the observation, otherwise it is called balanced. Autocorrelation[67] describes when disturbances across the observations might not truly be independent.

Heteroscedasticity signifies inconsistency in the regression disturbance of the variances across the observations. Heteroscedasticity[68] arises in numerous applications — in both cross-section and time series data — and poses potentially severe problems for inferences based on least squares. To control for the problem of heteroscedasticity it could be tested with:[69]

    1. White's general test[70]

    2. Breusch-Pagan Lagrange multiplier test (for heteroscedasticity)[71]

The White test is extremely general. There are no specific assumptions about the nature of the heteroscedasticity.[72] The hypothesis to test is if the variance σ^2 is:

$$H_0 : \sigma_i^2 = \sigma^2 \qquad \text{for all } i \qquad \text{and } H_1 : \text{Not } H_1$$

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[66] **Wansbeek, T. and Kapteyn, A.,** Estimation of the Error-Components Model with Incomplete Panels, *Journal of Econometrics*, 1989, *41*(3), pp. 341-361.

[67] Autocorrelation — the dynamic panel models: The assumption that deviations of observations from their expected values are uncorrelated is labeled non-autocorrelation. These autocorrelation, or dynamic, models allow past expressions of the dependent variable to affect its current level. If there is autocorrelation in the model, it can be tested for. Methods of handling autocorrelation in economic data occupy a large proportion of the literature. **Durbin-Watson** developed a test for first-order autocorrelation for residuals; modified by **Bhargava** to handle balanced panel data; and further by **Baltagi** and **Wu** to handle unbalanced panel data. **Arellano** and **Bond** developed a model to apply estimators to lagged dependant variables to account for dynamic effects. The lagged dependent variables can be introduced to either fixed or random effects models. The described models and tests are a selection of the different solutions for the dynamic model. There are several more specifications to deal with adjustments for panel data analysis; which can be derived in depth from the literature mentioned here. **Greene,** Econometric Analysis, Chapter 19.

[68] **Greene,** Econometric Analysis, p. 215; **Cook, D. R. and Weisberg, S.,** Diagnostics for Heteroskedasticity in Regression, *Biometrika*, 1983, *70(1)*, pp. 1–10.

[69] **Wooldridge,** Econometric Analysis of Cross Section and Panel Data, p. 177.

[70] **White, H.,** A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity, *Econometrica*, 1980, *48*(4), pp. 817-838; **Greene,** Econometric Analysis, p. 222.

[71] **Breusch, T. and Pagan, A.,** A Simple Test for Heteroscedasticity and Random Coefficient Variation, *Econometrica*, 1979, *47*, pp. 1287-1294; **Greene,** Econometric Analysis, p. 223.

[72] **Greene,** Econometric Analysis, p. 222.

Breusch and Pagan have devised a Lagrange multiplier test of the hypothesis $\sigma_i^2 = \sigma^2 f(\alpha_0 + \alpha z_i)$, where is z a vector of independent variables. The model is homoscedastic if $\alpha = 0$.

The White robust estimator is a classic way to correct for heteroscedasticity.[73]

This chapter has described the core models and tests: the panel data analysis with pooled regression, fixed and random effects models, the effects of time and country, and the test of heteroscedasticity.

Panel data analysis investigates multiple cases, in this instance, countries with repeated observations over years. The weakness of this approach is that PE activity is analyzed within countries seen as isolated entities. The propensity of a country to invest in another country cannot be captured. The key to analyze country interaction is to extend the cross-section from country to country pairs, that is, to source country and host country combinations. The gravity model focuses on analyzing country pair relations.

2.2.2. Gravity model analysis

The theory behind the gravity model is a supply and demand system that quantifies the volume of trade between any two countries. The gravity model equation models bilateral trade as a function of the characteristics of the countries and the country pairs.[74]

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[73] **White,** A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity.

[74] For further theoretical foundations see: **Oguledo, V. I. and MacPhee, C. R.,** Gravity Models: A Reformulation and an Application to Discriminatory Trade Arrangements, *Applied Economics*, 1994, *26*(2), pp. 1007-1021; **Egger,** An Econometric View on the Estimation of Gravity Models and the Calculation of Trade Potentials; **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects; **Deardorff, A. V. and Frankel, J. A.,** Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?, *NBER Project Report series. Chicago and London: University of Chicago Press*, 1998, pp. 7-22; **Evenett, S. and Keller, W.,** On Theories Explaining the Success of the Gravity Equation, *Working Paper NBER*, 1998(6529).

Figure 8: The gravity model (schematic)
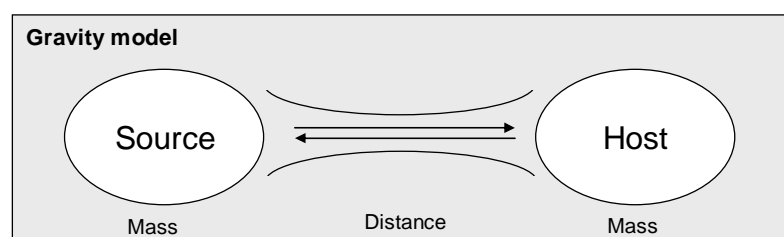
The model in general explains activities between two countries as being a positive function of the economic masses of those countries, and a negative function of the economic distance between them. Gravity models were first applied to international trade by Tinbergen (1962).[75] The theoretical foundations were subsequently developed by Anderson (1978)[76] and Bergstrand (1985).[77] The basic specifications of the gravity model include supply factors of the export country (e.g., population and GDP), demand factors of the import country (e.g., population and GDP), and trade-supporting determinants (such as proxies of transport cost, and geographical and cultural measures of country proximity).[78] The traditional gravity model, with source and host country, has evolved from a two-dimensional model — source and host country — into a three-dimensional model using panel data and including time-varying observations.[79]

In a three-dimensional model the affinity of countries can be explored by time-invariant and time-variant determinants. Time-invariant determinants describe a constant country pair affinity; time-variant determinants change the country pair affinity itself and the relative affinity of the country pairs for each other compared to the whole system.

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[75] **Tinbergen,** Shaping the World Economy.
[76] **Anderson, J. E.,** A Theoretical Foundation for the Gravity Equation, *American Economic Review*, 1979, *69*(1), pp. 106-116.
[77] **Bergstrand,** The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence.
[78] **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects.
[79] **Matyas,** Proper Econometric Specification of the Gravity Model; **Matyas,** The Gravity Model: Some Econometric Considerations; **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects.

The specification of the gravity model with time variation, usually in log-log[80] form, takes the following form:

Equation 10: The basic gravity model

$$y_{ijt} = \alpha_i + \gamma_j + \lambda_t + \beta_1 x_{it} + \beta_2 x_{jt} + \beta_3 x_{ij} + ... + u_{ijt} \qquad i,j = 1,...,N, \quad i \neq j, \quad t = 1,...,T$$

where y_{ijt} is the volume of transfer (exports) from country i to country j at time t, x_{ijt} is the vector of structural explanatory variables; in detail x_{it} is the country i (source) specific data at time t, and x_{jt} is the country j (host) at time t. x_{ij} is country pair specific data between the countries i and j. α_i, γ_j, and λ_t are the unobserved specific effects.[81] In detail:

α_i is the source country effect, $\qquad i = 1,...,N$

γ_j is the host country effect $\qquad j = 1,...,N$

λ_t is the time (business cycle) effect $\qquad t = 1,...,T$

u_{ijt} is the usual white noise disturbance term and β is the unknown parameter vector.[82] The equation is sometimes augmented to include bilateral interaction effects by inclusion of δ_{ij}.[83]

Recognizing the underlying panel data nature of the gravity model, the parameters α_i, γ_j, and λ_t can be treated from an economic point of view as random variables (random effect) or fixed variables (fixed effect).[84] Given that in this analysis these parameters are of special interest, they are formalized here as

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[80] Using logarithms, the equation can be converted to a linear form for econometric analysis. **Matyas,** Proper Econometric Specification of the Gravity Model; **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects.

[81] **Matyas,** Proper Econometric Specification of the Gravity Model, p. 363.

[82] **Matyas,** Proper Econometric Specification of the Gravity Model, p. 363; **Matyas,** The Gravity Model: Some Econometric Considerations; **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects; **Baltagi; Egger and Pfaffermayr,** A Generalized Design for Bilateral Trade Flow Models.

[83] **Egger,** An Econometric View on the Estimation of Gravity Models and the Calculation of Trade Potentials; **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects.

[84] Matyas suggests the random and fixed approaches for different data sets (1997) (1998). See also: **Cheng, I. H. and Wall, H. J.,** Controlling for Heterogeneity in Gravity Models of Trade and Integration, *Review (00149187)*, 2005, *87*(1), pp. 49-63.

fixed unknown parameters for a main and interaction effect analysis. The model is then a generic form of a gravity model and a direct generalization of the two-way panel data model.[85] Many adjustments have been made in academic literature to handle the complexity of the gravity model, especially for unbalanced data sets with missing data or zero trade flows.[86]

With the above assumptions, the proper econometric expression of the gravity model with time variation can be analyzed with fixed main time, source, and host effects. The source and host effects control for all time-invariant country characteristics, both observable and unobservable. Time effects capture cyclical influences commonly shared by all involved countries, as described in the model (Equation 10).[87] Many solutions are considered to properly address the fixed-effect approach when using panel data to estimate a gravity model.[88]

One problem with fixed-effect panel regressions is that time-invariant variables are not considered. This means that a core variable of a gravity model, such as distance, would be missing.[89] To address this problem, empirical analysis follows the broad specifications of Matyas, Egger, and Pfaffermayr by using a pooled Ordinary Least Squares (OLS) regression as a basis that does not include fixed effects.

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[85]   **Matyas,** Proper Econometric Specification of the Gravity Model.

[86]   **Greene; Harris and Matyas,** Gravity Models, Zero Trade Flows and Fixed Effects; **Linders, G. T. and De Groot, H.,** Estimation of the Gravity Equation in the Presence of Zero Flow, *Tinbergen Institute Discussion Paper, Tinbergen Institute, Free University Amsterdam*, 2006, *Ti 2006-073*(3); **Raballand, G.,** Determinants of the Negative Impact of Being Landlocked on Trade: An Empirical Investigation Through the Central Asian Case, *Comparative Economic Studies*, 2003, *45*(4), pp. 520-536; **Wang, Z. and Winters, L.,** The Trading Potential of Eastern Europe, *CEPR Discussion Paper 610 London*, 1991.

[87]   **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects; **Baltagi,** Econometric Analysis of Panel Data; **Pirotte, A.,** Convergence of the Static Estimation Toward the Long-Run Effects of Dynamic Panel Data Models: A Labour Demand Illustration, *Applied Economics Letters*, 2003, *10*(13), pp. 843-847.

[88]   **Baltagi; Egger and Pfaffermayr,** A Generalized Design for Bilateral Trade Flow Models; **Davies, R. B.; Ionascu, D. and Kristjansdottir, H.,** Estimating the Impact of Time-Invariant Variables on FDI with Fixed Effects2005, pp. 37-37.

[89]   **Borrmann; Jungnickel and Keller,** What Gravity Models Can Tell Us About the Position of German FDI in Central and Eastern Europe, p. 8; **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects; **Davies; Ionascu and Kristjansdottir,** Estimating the Impact of Time-Invariant Variables on FDI with Fixed Effects.

Equation 11: The OLS regression of the gravity model without fixed effects

$$y_{ijt} = \beta_0 + \beta_1 x_{ijt} + \beta_2 x_{it} + \beta_3 x_{jt} + \beta_4 x_{ij} + \beta_5 x_i + \beta_6 x_j ... + \varepsilon_{ijt}$$

$$i, j = 1,...,N, \quad i \neq j, \qquad t = 1,...,T$$

where x_{it} and x_{jt} are the source's and host's time variables (e.g., GDP), x_i and x_j include source and host's time invariant characteristics (e.g., land area), x_{ij} are the time-invariant country pair characteristics (e.g., distance), and x_{ijt} includes country pair time-varying data (e.g., exchange rates). The specific effects can be controlled for by including dummy variables for source d_i host d_j and time d_t in this OLS regression (see panel data analysis LSDV above).

Including the dummies for the specific source host or time effect has the consequence that the related variables with the specific dimension cannot be included in the model. The only dummy variable that can be considered — if all the other variables are included in the model — is the time dummy. The equation with OLS regression, including time dummies (d_t), is:

Equation 12: The OLS regression as gravity model with time dummies

$$y_{ijt} = \beta_0 + \beta_1 x_{ijt} + \beta_2 x_{it} + \beta_3 x_{jt} + \beta_4 x_{ij} + \beta_5 x_i + \beta_6 x_i ... d_{t-1} + \varepsilon_{ijt}$$

$$i, j = 1,...,N, \quad i \neq j, \qquad t = 1,...,T$$

This gravity model is the basic form used for this paper's research. It analyzes variables that affect the PE cross-border activity of source and host country over time with relevant explanatory variables by testing the hypothesis:

$H_0 = Null\ Hypothesis\ no\ effect$ $\qquad\qquad H_1 = Alternative\ Hypothesis\quad effect$

with the assumption of H_0 for each variable, the H_0 hypothesis is rejected if H_0 is unlikely. The F-test statistic is applied for the regression analysis with the standard procedure, testing the hypothesis that the means of multiple, normally distributed populations, all having the same standard deviation, are equal.[90] The simplest form of this test is the analysis of variance (ANOVA), which analyses the main and interaction effects — in this case, of source, host, and year with the following equation.[91]

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[90] **Greene,** Econometric Analysis, pp. 50 and 95.
[91] **Greene,** Econometric Analysis, p. 95.

Equation 13: The OLS regression with dummy variables for the main and interaction effects

$$y_{ijt} = d_{i-1} + d_{j-1} + d_{t-1} + d_{ij-1} + d_{it-1} + d_{jt-1} + \varepsilon_{ijt} \qquad i,j = 1,...,N, \quad i \neq j, \qquad t = 1,...,T$$

For the gravity model analysis, two different approaches are applied in this research. First, a model with the fixed main and interactive effects of source, host, and years with dummy variables, not including explanatory variables (ANOVA, Equation 13), and second, the gravity model with the full set of derived determinants, with time effects described schematically by Equation 12.

The developed theoretical gravity model will be further adjusted to the empirical data after the derivation of the dependent and independent variables.

2.3. Conceptualization and definition of variables

2.3.1. Conceptualization of private equity activity

Before looking into which determinants influence cross-border PE activity, it must be defined how to quantify PE activity in a country and between countries as a dependent variable over time.

2.3.1.1. Principles of measuring private equity activity

As indicated by the theory, activity includes all deal sourcing by companies or institutions that balances the supply and demand of goods and services between each other. The intent to invest — a potential deal — is difficult to capture and does not result in the balance of supply and demand between two parties. Balance is achieved by the deal (defined in Chapter B.2.1.) that can be quantified by the involvement of companies in a transaction of goods and / or services for money at a certain time. For this analysis, the dependent variables of country activity must be extrapolated from the deal level to the country level.

The **activity** of a deal can be measured in two ways: first, by simply counting deals (participation in a deal) and second, as deal flow, here equivalent to the amount of money transferred in exchange for equity. The actual deal count reveals the frequency of investment — the number of deals in a country per year, while deal flow measures the intensity of the investment — the amount invested per country per year.

Both variables — participation and deal flow — are used for this analysis. The variable participation assures sensitive and accurate measurement of country activity unrelated to deal volume. The differentiation also allows the comparison of deal flow and participation. It accounts for the different deal volumes in stage financing and the availability of large investments in a country.

The character of PE deals implies that the quantity of deal activity can be observed and captured at both the investor and target sites. The following figure illustrates this in detail for two independent deals (x_1 & x_2) of PE firms (A & C) investing in portfolio companies (B & D) with their sources (S_1 & S_2) and host countries (H_1 & H_2) in single investor deals.

Figure 9: Measurement of dependent variables
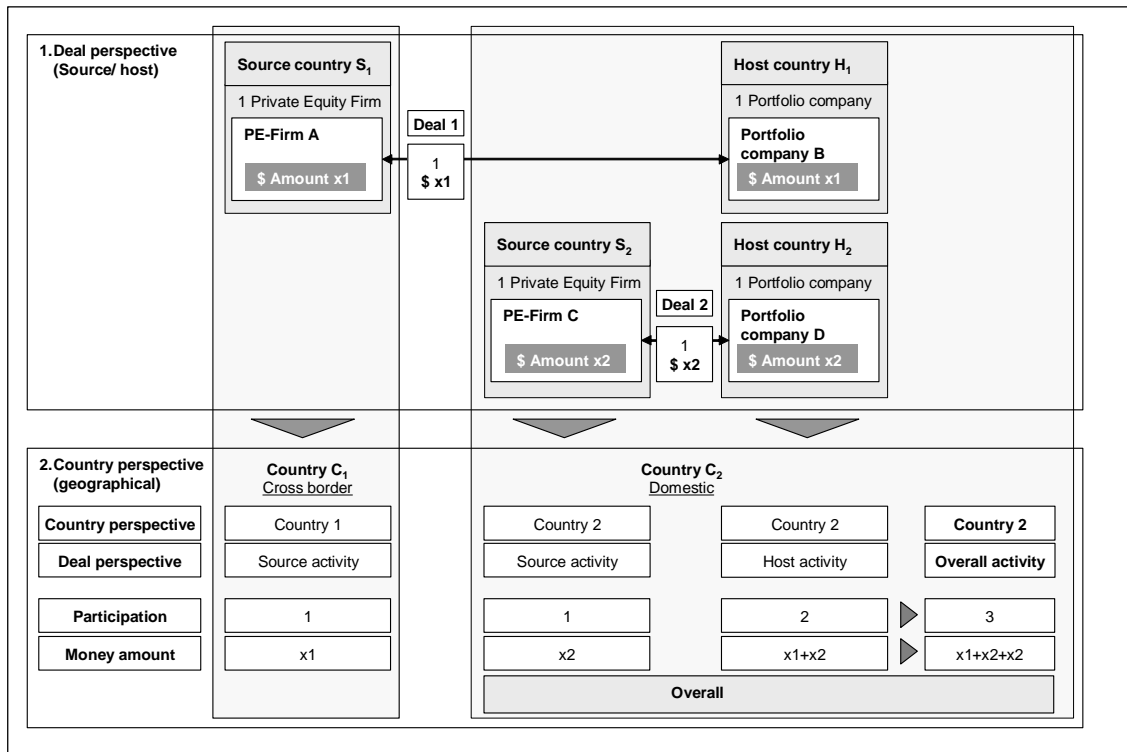
In the deal perspective, the participation "1" and the amounts x_1 and x_2 for the deals can be measured on both sides — the source and the host country. Extending the perspective from the country deal view to the geographic country (see Chapter B.2.1. for the definition) exemplifies two countries C_1 (= S_1) and C_2 (= S_2 = H_1 = H_2) with one cross-border deal (Deal$_1$, x_1) and one domestic deal (Deal$_2$, x_2). The combination of deal perspective — with source and host of

investment — and geographic country perspective result in three different perspectives for activity measurements (illustrated by the example for $Country_2$):

1. **Source country:** source activity of country only (1 deal — amount x_2)

2. **Host country:** host activity of country only (2 deals — amount $x_1 + x_2$)

3. **Overall country activity:** sum of source and host activity (3 deals — amount $x_1 + x_2 + x_2$)

Deals are double-counted from the country perspective in overall country activity. It makes sense to compare countries by differentiating data into overall activity, source, and host activity. Otherwise it is impossible to capture and compare the distinct activity of a country in its double role as source and host country.

The three kinds of measurement describe typical cross-sectional data sets used in combination with time series when using panel data analysis. For gravity model analysis, the measurement described above is not exhaustive.

The gravity model uses a vector as the dependent variable y_{ij} — besides, the quantity a direction of deal is defined as being from the source to the host country. The vector is:

Country pair combination with $source_1$ to $host_1$ country activity (1 deal) with amount x_1.

For the traditional gravity model analysis, this dependent variable definition of country activity from one country to another country would be sufficient, but the complex nature of PE deals requires further specification.

2.3.1.2.   In-depth measurement of private equity activity

The definition of the traditional "single investor deal" used in trade flow measurement does not exhaustively take into account the special characteristics of PE deals and needs to be enhanced to measure deal activity accurately to fulfill the requirements of this analysis. Difficulties in measuring cross-border country activity arise if PE firms from different countries invest together in one PF company at the same time ("multi investors deals"). In this case, the activity of a country must be calculated in proportion to the deal participation of each firm. The measurement is illustrated by one deal in the following graph:

Figure 10: Measurement of private equity activity involving more than one investor

1 | Deal scheme

Host country — Date — Source countries

Portfolio-Company (1 Company)
Portfolio-Company: X — Early stage (VC) — Country: C — $ Amount C1 — $ Amount A1 — $ Amount A2 — $ Amount B1 — C

Fund Investment — Weight 1/3, 1/3, 1/3

Funds (3 Funds):
Fund A 1 — Venture Capital — $ Amount A1
Fund A 2 — Venture Capital — $ Amount A2
Fund B 1 — Venture Capital — $ Amount B1

Firm Investment — Weight 1/4, 1/4 → 1/2; 1/2 → 1/2

PE-Firms (2 Firms):
PE-Firma: A — Country: A — A
PE-Firma: B — Country: B — B

2 | Activity measurement

Dependent variable host:

I	2	1	II
Host	Deal flow	Deal Participation	Time
C			T1
C			T1
C	C1 = A1+A2+B1	1	

Dependent variable source:

3	4	5	6	III
Fund participation	Deal flow	Deal participation	Participation	Source
1+1	A1+A2	1/2	1	A
1	B1	1/2	1	B
3	A1+A2+B1	1	2	?

3 | Dependent variable arrangement for analysis

Derivation of dependent variable assortment for analysis

III	I	II	6	5	4	
Direction		Time	Quantity			Stage
Source	Host	Year	Participation	Deal participation	Deal flow	VC/ PE
A	C	T1	1	0.5	A1+A2	VC
B	C	T1	1	0.5	B1	VC

The figure details the derivation of the dependent variable if more than one PE firm (A and B) invest their funds (A_1, A_2, B_1) in one PF company (C) with different country locations. Three funds (A_1, A_2, B_1) invest in company C with the amounts $A_1 + A_2 + A_3 = C_1$. Fund participation in the deal is 1/3 for each fund. Two funds (A_1 & A_2) belong to PE firm$_A$ located in country$_A$.[92] The third fund, B1, belongs to

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[92] If a third firm from country A also invests in the company, the deal participation for country$_A$ would be 2/3, for country$_B$ 1/3.

PE firm$_B$ located in country$_B$. The dependent variable for source and host country can be measured in detail as follows:

Host country perspective

1. Portfolio company participation: count of participation in deal

2. Portfolio company deal flow: amount invested in PF company

Source country perspective

3. Fund participation: count of funds investing in PF companies

4. Deal flow: amount of money invested by each fund and by each PE firm

5. PE firm deal participation: sum of proportional participation of PE firms

6. PE firm participation: count of participation of firm

The differentiation of this information into the various activity measurements of multiple investor countries for the gravity model can only be accomplished in the source country perspective. The dependent variables are **participation** (6), **deal participation** (5), and **deal flow** (4) of the source country. The host value is understood as the sum of the corresponding activity variables of the source country. The new analytical arrangement for the gravity model has the vector direction: source to host, at a certain point of time (year), and three measurements of quantity of activity: participation, deal participation, and deal flow. The dependent variable derivation is so far confined to one observation at one particular point in time. Observing and tracking the deal participants over time opens an additional "multi investors over time" perspective. It adds a reference to the past and connects the formerly independent time layers by tracking the cycle of participation.[93] The combination of company investment (first deal for a PF company) and participation by an investor (first deal for an investor), compounded by the number of investors, leads to different deal types.

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[93] **Bengtsson, O.,** Relational Venture Capital Financing of Serial Founders, *Cornell University Working Paper Series*, 2008.

Table 1: Derivation of deal type

Scenario	Deal type	PF - Company	Date (Round)	PE-Firm	PF-Company participation	PE-Firm participation	Weight
1.1	First deal - single	X	**1**	A	first	first	1
	First deal - multiple			B	first	first	1/3
1.2	First deal - multiple	X	**1**	C	first	first	1/3
	First deal - multiple			D	first	first	1/3
2.1	New deal - single	X	**2**	E	refinancing	first	1
2.2	New deal - multiple	X	**2**	E	refinancing	first	1/2
	New deal - multiple			F	refinancing	first	1/2
3.1	Refinancing - single	X	**2**	A	refinancing	refinancing	1
3.2	Refinancing - multiple	X	**2**	B	refinancing	refinancing	1/2
	Refinancing - multiple			C	refinancing	refinancing	1/2
4	Deal mix - refinancing	X	**2**	A	refinancing	refinancing	1/2
	Deal mix - first			G	refinancing	first	1/2

Three main categories are derived from the PF company and PE firm combination: (1) **first deal:** first-time investment in a PF company; (2) **new deal:** new investor invests in particular company; (3) **refinancing:** previous investors refinance the company. These categories are further broken down into single and group investments, which lead to differentiation of the three categories into single and multi-investor deals. Combining the categories with the number of participants leads to a fourth category — **deal mix:** a previous investor refinancing the company, but bringing in a new investor that is financing the company for the first time. This differentiation exemplifies "true deals" — early adopters and followers into different countries. Including the investment round with the number of participants into the analysis results in the following variable arrangement:

Figure 11: Dependent variable for analysis with investment round consideration

Direction		Time	Quantity				Deal type	Stage
Source	Host	Year	Participation	Deal part.	Deal lfow			VC / PE
A	C	T1	1	1	$A0		First deal - single	VC

T / Investment round

Direction		Time	Quantity				Deal type	Stage
Source	Host	Year	Participation	Deal part.	Deal lfow			VC / PE
A	C	T2	1	0.5	$A1+$A2		Deal mix refinancing	VC
B	C	T2	1	0.5	$B1		Deal mix first	VC

Finally, the proportion of activity in percent of the particular observations compared to the total observations is calculated for each of the three activity

variables to weigh the activity in relation to the global investment activity over all years. For example the activity in percent for deal flow between country B to C is B1/ (A0+A1+A2+B1) under the assumption that these deals represent the total of global investments. Out of the particular activity a summarizing overall activity is calculated for each observation by averaging the partial activities for each observation.

Table 2: Final quantification of dependent variable with overall activity in percentage

Direction		Time	Quantity			Activity %				Deal type	Stage
Source	Host	Year	Participation	Deal part.	Deal lfow	Participation	Deal part.	Deal flow	Overall		VC / PE
A	C	T1	1	1	$10	17%	25%	11%	18%	First deal - alone	VC
A	C	T2	1	0.5	$18	17%	13%	20%	16%	Deal mix refinancing	VC
B	C	T2	1	0.5	$12	17%	13%	13%	14%	Deal mix first	VC
D	E	T3	1	0.5	$5	17%	13%	6%	12%	First deal - mix	PE
F	E	T3	1	0.5	$15	17%	13%	17%	15%	First deal - mix	PE
G	H	T4	1	1	$30	17%	25%	33%	25%	First deal - alone	VC
Total			6	4	$90	100%	100%	100%	100%		

The final observation unit utilizes criteria for the quantification of the dependent variable: source, host, year, participation, deal participation, deal flow, overall activity as a percentage, deal type (inherent investment round and number of participants), and the finance stage of a company.

2.3.2. Conceptualization of indicators of private equity activity

The complexity of the economics of PE on a global level requires a structured approach to capture relevant indicators. The derivation of the explanatory variables is based on the two concepts extracted from the theoretical framework. First, the method-related approach of the three-dimensional gravity model (Chapter B.1.2.2.), capturing cross-border relevant indicators, and second, the economics of the PE market, focusing on PE-relevant indicators. To structure the process further, the information from Chapter B.1.1. (definition and specifications of the research object) is used; topic-related studies (Chapter B.1.2.1.) serve as further support and guidance.[94] The objective is to systematically explore

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[94] **Blonigen,** A Review of the Empirical Literature on FDI Determinants; **Hofstede, G.,** Cultural Constraints in Management Theories, *International Review of Strategic Management*, 1994, *5*, pp. 27-37; **Hofstede, G.,** Organizing for Cultural Diversity, *European Management Review*,

(cont)

distinctive and exhaustive indicators that influence PE investment. Figure 12 illustrates the derivation of determinants.

Figure 12: Derivation of indicators for analysis
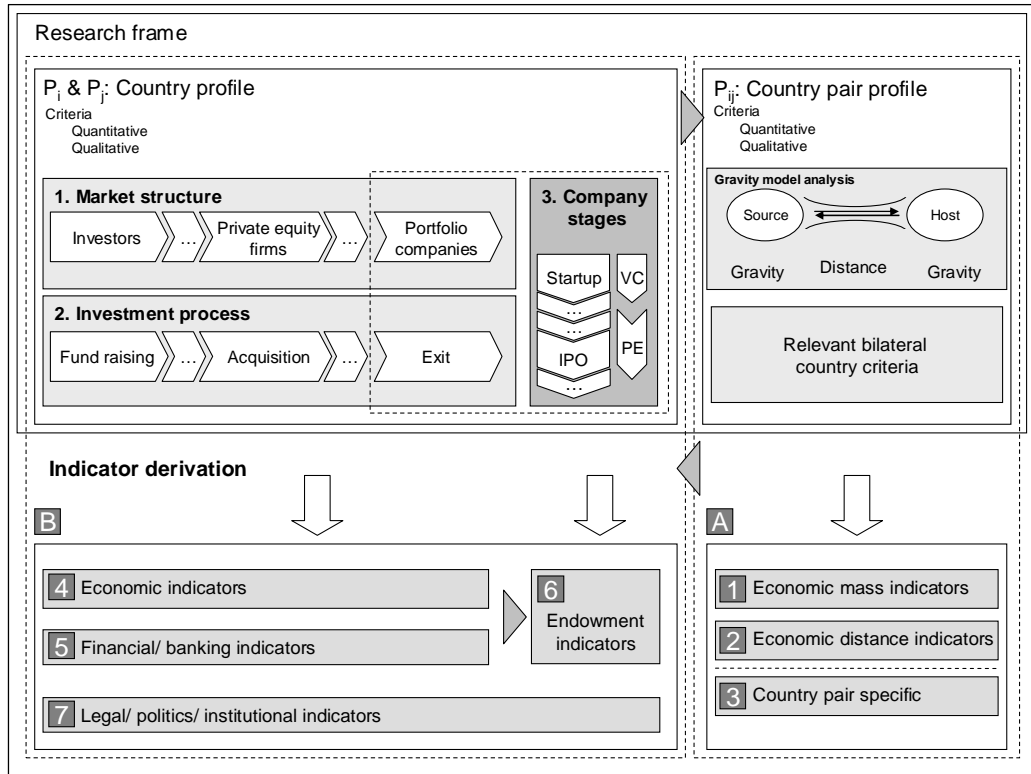
The graph shows a subsegment of the research frame (Chapter B.2.1.) in which the country profiles P_i & P_j and the country pair profile P_{ij} are embedded. The relevant theoretical subframes of the gravity model and the PE market environment indicate the derivation of the hypotheses and the explanatory

2001, *7*(4), pp. 390-397; **Hofstede, G. and Bond, M. H.,** The Confucius Connection: From Cultural Roots to Economic Growth, *Organizational Dynamics*, 1988, *16*(4), pp. 4-7; **Hofstede, G. H.,** Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations, Thousand Oaks, Calif.: Sage Publications, 2001; **Portes, R. and Rey, H.,** The Determinants of Cross-Border Equity Flows, *Journal of International Economics*, 2005, *65*(2), pp. 269-311; **Deardorff and Frankel,** Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?; **Helpmann,** The Structure of Foreign Trade; **Hummels and Levinsohn,** Monopolistic Competition and International Trade: Reconsidering the Evidence; **Gao,** Foreign Direct Investment in China: How Big Are the Roles of Culture and Geography?; **Chintrakarn, P.,** The Determinants of Cross-Border Equity Flows: A Dynamic Panel Data Reassessment, *Applied Financial Economics Letters*, 2007, *3*(1-3), pp. 181-185.

analytic variables. The subframe **country profile** (P_i & P_j) shows how the economics of the PE market relate to the investment process and the company stages (Chapter B.1.1.). The three former independently illustrated schemes are linked via the element *PF companies* in market structure, and the element *exit* of the investment process in the company stages. The graph indicates, as shown in Chapter B.1.1., how the economics of the PE market depend very much on the economic conditions of a country (B_4), the financial and banking sectors (B_5), and the legal regulations of a country (B_7), all in relation to the global economic environment.[95]

Endowment-related indicators (B_6) are a subset of special indicators. They result from the confluence of three categories: market structure, investment process, and company stages. These indicators address relevant criteria for the company life cycle, especially for the start-up and exit phases of a PE business.

The gravity model approach is embedded in the **country pair profile** (P_{ij}), from which, with support from the country profile, are derived the relevant gravity model specific indicators for mass (A_1) and distance (A_2), and country pair specific indicators resulting from the specific country pair constellation (A_3).

For the cross-border analysis, relevant hypotheses with the explanatory indicators are developed from the seven main categories.

A) Gravity model: Since the gravity model is a positive function of the economic masses of two countries and a negative function of the economic distance between them, two hypotheses for PE cross-border investments can be formulated from it:

$H_{GM\ 1EM}$:   The larger the economic mass, the larger the cross-border PE investment.

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[95] For a discussion on the effect of institutional, regulatory, and cultural factors, see; **Jeng and Wells,** The Determinants of Venture Capital Funding: Evidence Across Countries; **La Porta, R.; Lopez-de-Silanes, F.; Shleifer, A. and Vishny, R. W.,** Law and Finance, *Journal of Finance*, 1996; **La Porta, R.; Lopez-de-Silanes, F.; Shleifer, A. and Vishny, R.,** Legal Determinants of External Finance, *Journal of Finance*, 1997, *52*, pp. 1131-1150; **Tykvova, T.; Westerheide, P. and Zinser, B.,** Private Equity im internationalen Vergleich — Analyse der Rahmenbedingungen und Schlussfolgerungen für Deutschland, *ZEW - Center for European Economic Research*, 2005; **Hitt, M. A.; Tihanyi, L.; Miller, T. and Connelly, B.,** International Diversification: Antecedents, Outcomes, and Moderators, *Journal of Management*, 2006, *32*(6), pp. 831-841.

H[GM 2ED]:   The nearer the economic distance, the larger the cross-border PE investment.

According to various theoretical studies, to explain cross-border activity and, more specifically, the regional distribution of PE investment, an empirical study based upon the PE gravity model should include traditional indicators for mass and distance:[96]

1. Economic mass indicators: The gross domestic product as an indicator of market volume and economic productivity; population or area as an indicator of country size.[97]

2. Economic distance indicators:[98] First, geographical distance between capitals or economic centers; second, factors affecting the economic distance between countries: for example, common language, common border, common

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[96]   For the theoretical approach of the gravity model, see the previously mentioned studies of **Matyas; Eggers; Baltagi**; etc. and for practical use, compare: **Sarisoy Guerin,** The Role of Geography in Financial and Economic Integration: A Comparative Analysis of Foreign Direct Investment, Trade and Portfolio Investment Flows; **Janeba, E.,** International Trade and Consumption Network Externalities, *European Economic Review*, 2007, *51*(4), pp. 781-803.

[97]   For discussion of the impact of economic mass on trade flow, compare: **Linnemann,** An Econometric Study of International Trade Flows; **Bergstrand, J. H.,** The Generalized Gravity Equation, Monopolistic Competition, and the Factor-Proportions Theory in International Trade, *The Review of Economics and Statistics*, 1989, *71*(1), pp. 143-149; **Baldwin, R.,** Towards an Integrated Europe *CEPR Discussion Paper*, 1994; **Acs, S. J. and Audretsch, D. B.,** New-Firm Startups, Technology, and Macroeconomic Fluctuations, *Small Business Economics*, 1994, *6*.
      For discussion of the negative impact of population as an economic indicator, compare: Bergstrand (1989, p. 146); **Linnemann,** An Econometric Study of International Trade Flows; **Aitken, N. D.,** The Effect of the EEC and EFTA on European Trade: A Temporal Cross-Section Analysis, *American Economic Review*, 1973, *63*(5), pp. 881-893; **Bikker, J. A.,** An International Trade Flow Model With Substitution: An Extension of the Gravity Model, *Kyklos*, 1987, *40*(3), pp. 315-338; **Sapir, A.,** Trade Benefits under EEC Generalized System of Preferences, *European Economic Review*, 1981, *15*(3), pp. 339-335. For a postive impact of population on bilateral trade, compare: **Oguledo and MacPhee,** Gravity Models: A Reformulation and an Application to Discriminatory Trade Arrangements.

[98]   For the theoretical and practical use of the gravity model, especially for factors affecting cultural distance, compare: **Egger, P.,** On the Role of Distance for Bilateral Trade, *The World Economy*, 2008, *31*(5), pp. 653-658; **Hofstede,** Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations; **Hofstede,** Organizing for Cultural Diversity; **Hofstede,** Cultural Constraints in Management Theories; **Ionascu, D.; Meyer, K. E. and Estrin, S.,** Institutional Distance and International Business Strategies in Emerging Economies, *Working Papers (William Davidson Institute) - University of Michigan Business School*, 2004, pp. 1-44.

history, common currency,[99] common legal system, political dependency, whether the country is landlocked or a member of a trade organization, and other cultural indicators, such as religion, etc.

The economic mass and distance indicators may be regarded as elements of a traditional gravity model, whereas the following additional indicators are developed specifically to analyze PE investment.

3. Country pair specific indicators: The research frame provides a theoretical foundation for taking into account further country pair determinants, derived from the related theories of investment and PE.[100] Factors affecting PE activity can be assumed for general openness of a country toward international trade, its economic maturity, and the value of its currency compared to other countries. The hypotheses can be formulated thus:

$H_{GM\,3ER}$:   The higher a country's currency value, the greater its cross-border activity as a source country and the lower its cross-border activity as a host country.

$H_{GM\,3OP}$:   The more open a country is toward international trade, the greater the PE cross-border activity.

$H_{GM\,3DM}$:   The more developed a country, the greater the PE cross-border activity.

The country-specific indicators are: exchange rates,[101] average openness toward imports and exports,[102] and development status.[103] The exchange rate measures

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[99]   For the impact on common currencies, compare: **Frankel, J. A. and Rose, A. K.,** An Estimate of the Effect of Common Currencies on Trade and Income, *KSG Working Paper No. 01-013.*, 2001; **Glick and Rose,** Does a Currency Union Affect trade? The Time-Series Evidence.

[100] Compare studies of: **Rose and Spiegel,** Offshore Financial Centers: Parasites or Symbionts?; **Matyas, L.; Konya, L. and Harris, M. N.,** Modeling Export Activity in a Multicountry Economic Area: The APEC Case, *Monash Econometrics and Business Statistics Working Papers*, 1997, *1/97.*

[101] Compare studies of **Bergstrand,** The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence, p. 479, and **Baier, S. L. and Bergstrand, J. H.,** The Growth of World Trade: Tariffs, Transport Costs, and Income Similarity, *Journal of International Economics*, 2001, *53*(1), pp. 1-23 and 10 for a positive impact of a high real exchange rate index.

[102] **Egger, P.; Huber, P. and Pfaffermayr, M.,** A Note on Export Openness and Regional Wage Disparity in Central and Eastern Europe, *The Annals of Regional Science*, 2005, *39*(1), pp. 63-64; **Rose and Spiegel,** Offshore Financial Centers: Parasites or Symbionts?

both the differences in currency value and the investment potential for investors. The relationship of imports and exports to GDP is an indicator of any barriers into or out of a country and indicates the general propensity of a country toward cross-border activity. The development status of a country describes its relative economic maturity compared to other countries.

These indicators are essential to the gravity model because they result from the country pair constellation and describe conditions relative to other countries.

B) Private equity indicators: Views of the PE market and the investment process indicate a correspondence between PE activity and the economic, financial, institutional, and political environments.

4. Economic indicators: These are listed for completeness and have already been included in the analytic model (via derivation from the gravity model) as economic mass indicators. This category overlaps with the gravity model indicators.

5. Financial/banking system indicator:[104] Institutions that specialize in the finance sector, such as The World Bank or International Financial Statistics, and the OECD[105] recommend a variety of categories and indicators to describe the

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[103] **Rose and Spiegel,** Offshore Financial Centers: Parasites or Symbionts?; **Lerner, J. and Schoar, A.,** Transaction Structures in the Developing World, *NBER Working Papers*, 2004, *10348*.

[104] For the role of banks as financial intermediaries, compare: **Fama,** What is Different about Banks?; **Mayer,** New Issues in Corporate Finance; **Myers and Majluf,** Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have For bank competitiveness, see **Berger, A. N.,** The Profit-Structure Relationship in Banking - Test of Market Power and Efficient Structure Hypothesis, *Journal of Money, Credit & Banking*, 1995, *27*, pp. 404-431; **Bikker, J. A. and Haaf, K.,** Competition and Concentration and Their Relationship: An Empirical Analysis of the Banking Industry, *DNB Staff Report, De Nederlandsche Bank*, 2001, *68*; **Claessens, S. and Laeven, L.,** What Drives Bank Competition? Some International Evidence, *Journal of Money, Credit & Banking*, 2004, *36*(3), pp. 563-583; **Demirguc-Kunt, A. and Levine, R.,** Financial Structure and Economic Growth, *Cambridge MIT Press*, 2001; **Vives, X.,** Competition in the Changing World of Banking, *Oxford Review of Economic Policy*, 2001, *17*, pp. 535-545; **Greenwood, J. and Smith, B. D.,** Financial Markets in Development, and the Development of Financial Markets., *Journal of Economic Dynamics and Control*, 1997, *21*(1), pp. 145-181; **Maksimovic, V.; Beck, T.; Demirguc-Kunt, A. and Levine, R.,** Financial Structure and Economic Development: Firm, Industry, and Country Evidence, *World Bank Policy Research Working Paper*, 2000(2423).

[105] Compare BankScope1, Datastream; Worldscope, International Financial Statistics (IMF) and Global Financial Stability Report (IMF) for indicators.

finance sector in depth. Common major categories to describe the finance sector are size of the banking sector, efficiency, and competitiveness.[106]

The hypotheses for PE activity assume, as considered in Chapter B.1., a well-funded financial system, and can be formulated thus for each category:

$H_{PE\ 1FS}$:   The larger the financial sector, the greater the cross-border PE activity.

$H_{PE\ 1FE}$:   The higher the efficiency of the banking system, the greater the cross-border PE activity.

$H_{PE\ 1FC}$:   The more intense the competitiveness, the greater the PE cross-border investment.

The relevant indicators per category for this analysis are aligned with academic studies and key data sources, with main reference to The World Bank.[107] The three major categories with the complementary indicators are:

• **Size of finance sector**
  1. M2[108] to GDP, **2**. private credit to GDP, **3**. central bank assets to GDP, **4**. deposit money bank assets to GDP, **5**. financial system deposits, **6.** total bank assets to GDP, **7**. private credit to total domestic credit, **8**. private credit to total funding

  The indicators for **size** and intermediation in detail description are: *M2* (1) is a measure of total money supply — in particular money that can be converted within a short time period to be spent. *Private credit to GDP* (2) isolates the

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[106] For different measures of financial sector development, compare **Levine, R. and Zervos, S.,** Stock Markets, Banks, and Economic Growth, *American Economic Review 88*, 1998, pp. 537-558; **Rose and Spiegel,** Offshore Financial Centers: Parasites or Symbionts?; **Berger,** The Profit-Structure Relationship in Banking - Test of Market Power and Efficient Structure Hypothesis; **Bikker and Haaf,** Competition and Concentration and Their Relationship: An Empirical Analysis of the Banking Industry; **Claessens and Laeven,** What Drives Bank Competition? Some International Evidence; **Kim, S.-J. and Hooper, V. J.,** The Determinants of Capital Inflows: Does Opacity of Recipient Country Explain the Flows?, *Economic Systems*, 2007, *Vol. 31*(1); **Lane, P. R. and Milesi-Ferretti, G. M.,** Examining Global Imbalances, *Finance & Development*, 2006, *43*(1), pp. 38-45.

[107] **World Bank,** Financing Growth — Financial & Private Sector Development, 2007.

[108] Representative money indicator, which closely correlates with real economic activity. M2 is a measure of total money supply: M1 plus savings and other time deposits. Economists use M2 when quantifying the amount of money in circulation to explain different monetary conditions. M1 is money that can be used for spending and M2 is money that can be quickly converted to M1. (Bank of Japan).

credit issued to the private sector as opposed to the credit issued to governmental and public institutions. The indicator concentrates on the main activity of financial intermediaries other than a central bank.[109]

The next three indicators — *central bank assets* (3), *deposit money bank assets to GDP* (4), and *financial system deposits* (5) measure the size of financial services performed by different financial sectors — central banks, deposit money banks, and other financial institutions. *Total bank assets* (6) include the total assets of the banking system.[110]

The last two indicators — *private credit to total domestic credit* (7), and *private credit to total funding* (8) — concentrate (like the indicator *private credit to GDP*) on claims to the private sector, measuring in detail the fraction of total domestic credit in the economy covered by financial intermediaries and the funding by the financial system's deposits, foreign liabilities, bonds, and money market instruments.[111]

- **Efficiency of banking system**

  1. Return on assets, **2**. operating costs to total assets, **3**. net interest margin

  The indicators for **efficiency** with *return on assets* (1) and the *ratio of operating costs to assets* (2) show the profitability for the banking sector. Profitability is typically related to bank efficiency. *Net interest margin* (3) is considered similar to the gross margin of non-financial companies.[112]

- **Competitiveness of banking system**

  1. Lending minus deposit rate spread, **2.** bank concentration ratio (assets),
  3. bank concentration ratio (deposits), **4.** number of banks to GDP

  Competitiveness in the banking sector is measured by *lending minus deposit interest rate spread*[113] (1), *bank concentration ratio (by assets)* (2), *bank concentration ratio (by deposits)* (3), and *number of banks to GDP* (4). Higher

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[109] **World Bank,** Financing Growth — Financial & Private Sector Development.
[110] Total assets of the banking system: Assets includes cash and balance with the central bank; interbank deposits, loans, securities and other assets. **World Bank,** Financing Growth — Financial & Private Sector Development.
[111] **World Bank,** Financing Growth — Financial & Private Sector Development.
[112] **World Bank,** Financing Growth — Financial & Private Sector Development.
[113] The difference between the rate charged by banks on loans to prime customers and the rate paid by commercial or similar banks for demand, time, or savings deposits.

bank asset or deposit concentration — measured by industry share — accounted for by the top five banks[114] are used as indicators for less competitive banking systems. Furthermore, examining large differences in interest rate spread is another way to analyze competitiveness. The *number of banks to GDP* indicates the general density of banks compared to overall economic performance. [115]

6. Endowment-related indicators[116] describe conditions of the PE market that are effective in combining the phases of corporate development with the PE investment cycle. The three main categories are a country's scientific competitiveness,[117] its general corporate economic conditions, and the exit possibilities[118] for PE firms. The hypotheses for these categories are:

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[114] **Demirguc-Kunt and Levine,** Financial Structure and Economic Growth.
[115] **World Bank,** Financing Growth — Financial & Private Sector Development.
[116] **Kumar and Orleck,** Why Does Private Equity Vary Across Countries and Time?
[117] **Yeaple, S. R.,** The Role of Skill Endowments in the Structure of U.S. Outward Foreign Direct Investment, *Review of Economics and Statistics*, 2003, *85*(3), pp. 726-734; **Saxenian, A. L.,** Regional Advantage: Culture and Competition in Silicon Valley and Route 128, Cambridge, Mass.: Harvard University Press, 1996; **Kortum, S. S. and Lerner, J.,** Does Venture Capital Spur Innovation?, *National Bureau of Economic Research (NBER) Working paper series*, 1998; **Gompers, P. A. and Lerner, J.,** The Venture Capital Cycle, Cambridge, Mass.: MIT Press, 2004; **Park, W. and Ginarte, C.,** Intellectual Property Rights and Economic Growth, *Contemporary Economic Policy*, 1997, *July 15*(3), pp. 5-12; **Bergstrand, J. H. and Egger, P.,** A Knowledge-And-Physical-Capital Model of International Trade Flows, Foreign Direct Investment, and Multinational Enterprises, *Journal of International Economics*, 2007, *73*(2), pp. 278-288; **Lerner, J.,** Boom and Bust in the Venture Capital Industry and the Impact on Innovation, *Harvard NOM Working Paper*, 2001(03-13).
[118] **Gompers, P. A.; Kovner, A.; Lerner, J. and Scharfstein, D. S.,** Venture Capital Investment Cycles: The Impact of Public Markets, *NBER Working Paper*, 2005(W11385); **Black, B. S. and Gilson, R. J.,** Does Venture Capital Require an Active Stock Market?, *Journal of Applied Corporate Finance*, 1999, pp. 36-48; **Ranjan, D.; M., J. and A., S.,** Private Equity Returns: An Empirical Examination of the Exit of Venture Backed Companies, *Journal of Investment Management*, 2003, *11*, pp. 152-177; **Gompers, P. A. and Lerner, J.,** What Drives Venture Capital Fundraising?, *National Bureau of Economic Research (NBER) Working paper series*, 1999; **Carlin, W. and Mayer, C.,** Finance, Investment and Growth, *CEPR, Discussion Paper*, 1999, *2223*; **Mayer, C.,** Financing the New Economy: Financial Institutions and Corporate Governance, *Information Economics and Policy*, 2001, *1*; **Cochrane, J. H.,** The Risk and Return of Venture Capital, *Journal of Financial Economics*, 2005, *75*(3-52); **Ljungqvist and Richardson,** The Cash Flow, Return and Risk Characteristics of Private Equity. For a discussion of the effect of investment cycles on stock markets with the theoretical framework, see: **Baker, M.; Stein, J. C. and Wurgler, J.,** When Does the Market Matter? Stock Prices and the Investment of Equity-Dependent Firms, *Quarterly Journal of Economics*, 2003, *118*(3), pp. 969-1005; **Hong, H. and Stein, J. C.,** A Unified Theory of Underreaction Momentum Trading, and Overreaction in Asset Markets, *Journal of Finance*, 1999, *54*, pp.

(cont)

H$_{PE\ 2SC}$: The higher the scientific competitiveness, the greater the cross-border PE activity.

H$_{PE\ 2EC}$: The better the corporate economic conditions, the greater the cross-border PE activity.

H$_{PE\ 2EP}$: The better the exit possibilities, the greater the cross-border PE activity.

The above categories are associated with the following indicators:

- **Scientific competitiveness,**[119] as a measure of the skill value of a country's employees and knowledge base of a country: **1.** concentration of R&D engineers and scientists in the population, **2.** frequency of residential patent applications, and **3.** frequency of nonresidential patent applications as a limiting factor. These indicators generally describe the value conditions of a country, and are especially related to the start-up phase with VC financing.

- **Corporate economic conditions**: **1.** GDP per capita as a measure of a country's workforce productivity,[120] **2.** labor cost measured in average wages, indicating the qualification level of the workforce,[121] **3.** corporate tax rates,[122] measuring the highest corporate tax burden.

2143-2184; **Cumming and MacIntosh,** A Cross-Country Comparison of Full and Partial Venture Capital Exits.

[119] **Johnson, S.; McMillan, J. and Woodruff, C.,** Property Rights and Finance, *NBER Working Paper*, 2002(8852); **Park and Ginarte,** Intellectual Property Rights and Economic Growth

[120] **Hall, R. E. and Jones, C. I.,** Why Do Some Countries Produce So Much More Output per Worker than Others?, *Quarterly Journal of Economics*, 1999, *114*(1), pp. 83-116.

[121] **Hall and Jones,** Why Do Some Countries Produce So Much More Output per Worker than Others?; **Belke, A.; Fehn, R. and Foster, N.,** Venture Capital Investment and Labor Market Performance: A Panel Data Analysis, *CES ifo Working Paper*, 2002(652(4)); **Egger, H. and Egger, P.,** International Outsourcing and the Productivity of Low-Skilled Labor in the EU, *Economic Inquiry*, 2006, *44*(1), pp. 98-105; **Egger, H. and Egger, P.,** Labor Market Effects of Outsourcing Under Industrial Interdependence, *International Review of Economics & Finance*, 2005, *14*(3), pp. 349-352; **Borrmann; Jungnickel and Keller,** What Gravity Models Can Tell Us About the Position of German FDI in Central and Eastern Europe.

[122] **Gilson, R. J. and Schizer, D.,** Venture Capital Structure: A Tax Explanation for Convertible Preferred Stock, *Harvard Law Review*, 2003, *116*, pp. 875-916; **Grubert, H. and Mutti, J.,** Empirical Asymmetries in Foreign Direct Investment and Taxation, *Journal of International Economics*, 2004, *62*(2), pp. 337-358; **Cullen, J. B. and Gordon, R. H.,** Taxes and Entrepreneurial Activity: Theory and Evidence for the U.S., *NBER Working Paper W9015*, 2002; **Keuschnigg, C. and Nielsen, S. B.,** Tax Policy, Venture Capital and Entrepreneuership, *Journal of Public Economics*, 2003, *87*, pp. 175-203; **Poterba, J. M.,** Venture Capital and Capital Gain Taxation, *Tax Policy and the Economy*, 1989, *3*, pp. 47-67.

- **Exit possibility:** Stock market capitalization[123] measures the value of all stocks listed on an exchange. This indicator examines the conditions and attractiveness of a country's IPOs.

7. Institutional / legal / political variables:[124] These indicators describe general environmental conditions — opportunities for and threats to economic activity — with special focus on the institutional, legal, and political environments.

H_{PE_3SQ}: The better the institutional system, the greater the cross-border PE activity.

H_{PE_3LO}: The origin of the legal regime has an impact on cross-border activity.

H_{PE_3FR}: The more freedom of activity, the greater the cross-border PE activity.

The sources used in academic research are primarily the governance indicators from "Governance Matters" from The World Bank,[125] and the freedom indicators from Freedomhouse[126] and the Heritage Foundation.[127]

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[123] Measure of the value of all stocks listed on an exchange. **Worldbank,** Financing Growth - Financial & Private Sector Development, 2007.

[124] **Cumming, D. and Johan, S.,** Regulatory Harmonization and the Development of Private Equity Markets, *Journal of Banking & Finance*, 2007, *31*(10), pp. 3218-3221; **Brada, J. C.; Kutan, A. M. and Yigit, T. M.,** The Effects of Transition and Political Instability on Foreign Direct Investment Inflows, *Economics of Transition*, 2006, *14*(4), pp. 649-680; **Demirguc-Kunt, A. and Maksimovic, V.,** Law, Finance and Growth, *Journal of Finance*, 1998, *53*, pp. 2107-2137; **Djankov, S.; LaPorta, R.; Lopez-de-Silanes, F. and Shleifer, A.,** The Regulation of Entry, *Manuscript Harvard and the World Bank*, 2000; **Da Rin, M.; Nicodano, G. and Sembenelli, A.,** Public Policy and the Creation of Active Venture Capital Markets, *University Torino*, 2004; **Lerner, J. and Schoar, A.,** Does Legal Enforcement Affect Financial Transactions? The Contractual Channel in Private Equity, *Quarterly Journal of Economics*, 2005, *120*(1), pp. 223-246; **Shleifer, A.,** Government in Transition, *European Economic Review*, 1997, *41*, pp. 385-410; **Sahlman,** The Structure and Governance of Venture Capital Organizations; **Kaplan, S. N. and Strömberg, P.,** Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts, *Working Paper, University of Chicago*, 2001; **La Porta; Lopez-de-Silanes; Shleifer and Vishny,** Legal Determinants of External Finance.

[125] **Kaufmann, D.; Kraay, A. and Mastruzzi, M.,** Governance Matters 2007 Worldwide Governance Indicators, 1996-2006: 1. **Political Stability (PS)** measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism. 2. **Regulatory Quality (RQ)** measures the ability of a government to formulate and implement sound policies and regulations that permit and promote private sector development. 3. **Rule of Law (RL)** measures the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence. 4. **Control of Corruption (CC)** measures the extent to which public power is

(cont)

- **Institutional stability and quality: 1.** rule of law, **2.** political stability, **3.** regulatory quality, **4.** control of corruption[128]

- **Freedom indicators:** political rights, civil rights,[129] economic freedom[130]

- **Legal regimes and origin:**[131] common law, civil law, French law, Islamic law, mixed systems. The legal regime indicators are dummy variables for the origin of a country's legal system. They indicate if PE activity is fostered through specific legal systems, where common law provides the best legal protection for shareholder and creditor rights in various countries, followed by civil law and French law.[132]

The list of factors outlined is not an exhaustive set of determinants of PE investment activity. Rather, it distinguishes the core segments of macroeconomic cross-border investment, which could be further developed. For the sake of completeness, some additional variables that may affect PE activity but are not included in this study could include indicators for maturity of different markets, industry-specific variables, or microeconomic indicators. It must be said that

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exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

The indicators are based on hundreds of specific and disaggregated individual variables measuring various dimensions of governance, taken from 33 data sources provided by 30 different organizations.

[126] **Freedom House (U.S.),** Freedom in the World the Annual Survey of Political Rights and Civil Liberties, www.freedomhouse.org.

[127] **Heritage Foundation (Washington D.C.) and Wall Street Journal (Firm),** Index of Economic Freedom.

[128] **Egger, P. and Winner, H.,** How Corruption Influences Foreign Direct Investment: A Panel Data Study, *Economic Development and Cultural Change*, 2006, *54*(2), pp. 459-468.

[129] **Freedom House (U.S.),** Freedom in the World the Annual Survey of Political Rights and Civil Liberties.

[130] **Heritage Foundation (Washington D.C.) and Wall Street Journal (Firm),** Index of Economic Freedom.

[131] **Lerner and Schoar,** Does Legal Enforcement Affect Financial Transactions? The Contractual Channel in Private Equity; **La Porta, R.; Lopez-de-Silanes, F.; Shleifer, A. and Vishny, R.,** Investor Protection and Corporate Governance, *Journal of Financial Economics*, 2000, *58*, pp. 3-28; **La Porta; Lopez-de-Silanes; Shleifer and Vishny,** Legal Determinants of External Finance; **Kaplan, S. N.; Martel, F. and Strömberg, P.,** How Do Legal Differences and Experience Affect Financial Contracts?, *Journal of Financial Intermediation*, 2007, *16*(3), pp. 273-279.

[132] **Shleifer, A.; Hay, J. and Vishny, R.,** Towards a Theory of Legal Reform, *European Economic Review*, 1996; **La Porta; Lopez-de-Silanes; Shleifer and Vishny,** Law and Finance. According to Shleifer, civil law countries exhibit heavier regulations, weaker property right protection, and less political freedom than common law countries.

modeling a complete set of factors for a variety of countries and years is plagued by lack of data availability, which greatly increases complexity. The explanatory variables that were considered are the following:

Table 3: Overview of potential indicators for statistical analysis

A) Gravity model indicators	B) Private Equity indicators		

1) Economic mass related data:
  GDP
  Population
  Area
 	
2) Economic distance related variables:
  Distance
Factors affecting the economic distance:
  Common language
  Common border
  Common history
  Common currency
  Common legal system
 	
3) Country pair specific data
  Exchanger rates
  Openness of im- and exports to GDP
  Development
	1) Banking system
	1.1 Size
	  M2 to GDP
	  Private credit to GDP
	  Central bank assets to GDP
	  Deposit money bank assets to GDP
	  Financial system deposits to GDP
	  Bank assets to GDP
	  Private credit to total domestic credit
	  Private credit to total funding
	
	1.2 Efficiency
	  Return on assets
	  Operating costs to total assets
	  Net interest margin
	
	1.2 Competitiveness
	  Lending minus deposit interest rate
	  Bank concentration ratio (assets)
	  Bank concentration ratio (deposits)
	  Number of banks to GDP
		2) Endowment-related variables
		2.1 Scientific competitiveness
		  Engineers and scientists per thousand
		  Patents residential
		  Patents non residential
		
		2.2 Corporate economic conditions
		  GDP per capita
		  Wages in countries
		  Corporate tax rates
		
		2.3 Exit possibility
		  Stock market capitalization
			3) Institutional/ legal/ political
			3.1 Institutional stability and quality
			  Rule of law
			  Political stability
			  Regulatory quality
			  Control of corruption
			
			3.2 Legal regimes and origin
			  Common law
			  Civil law
			  French law
			  Islamic law
			  Other
			
			3.3 Freedom
			  Political rights
			  Civil rights
			  Economic freedom

3.   Data gathering for quantitative statistical analysis

The different variable sets for PE activity and the explanatory variables require multiple sources to gather specific data for analysis.

3.1.   Private equity investment data

PE investment data are available from various sources. Numerous institutions and associations[133] track PE and VC deals. These vary in quantity and quality. Professional online databases and intelligence tools designed for financial institutions seem the most reliable. The available professional databases on PE activity focus on different topics and each is therefore limited by its coverage of countries, time, and deal detail.[134] The most comprehensive database for this research is Thomson VentureXpert. This database has been used in other economic studies[135] and the data quality has been validated.[136] Thomson

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[133] **EVCA - European Venture Capital Association,** EVCA - Yearbook; **NVCA - National Venture Capital Association (USA),** National Venture Capital Association Yearbook.

[134] Compare **Standard & Poor's,** Capital IQ, 2007, www.capitaliq.com/main.asp; **The Merger Market Group,** Merger Market, 2007, www.mergermarket.com; **Thomson Financial,** Venture Xpert, 2006, www.thomson.com/content/financial/brand_overviews/VentureXpert.

[135] **Kaplan, S. N. and Schoar, A.,** Private Equity Performance: Returns, Persistence, and Capital Flows, *The Journal of Finance*, 2005, *60*(4), pp. 1791-1793; **Lerner, J.,** Venture

(cont)

VentureXpert data is used in this study as basic data to calculate country PE activity.

3.1.1. Database description

VentureXpert[137] is a query and report database for the PE industry. It provides comprehensive profiles of venture funds, private firms, venture-backed companies, and limited partners. The database contains information on more than 50,000 private equity-backed (PF) companies, and more than 16,000 VC and buyout funds managed by more than 8,000 PE firms. More than 100,000 PE transactions are listed, beginning with 1970,[138] which include deal and fund information from 100 countries. Several of the listed PF companies received backing at different points in time by different PE funds, so that the total number of investments amounts to approximately 250,000.

Data on investments include information about the PF company (location, status, industry), the fund (investment focus, vintage year), the PE firm (location, firm type, capital under management, firm status) and the particular investment (time of investment, stage, co-investors, equity amount provided by each fund, exit date).

The dataset is based on information Thomson obtains through its relationships within the PE industry. Due to the confidential character of PE investment, complete coverage of all investments by all funds remains difficult to achieve. Thomson accommodates this gap with a 0 value for missing information on confidential investments with an undisclosed equity amount.

Capitalists and the Oversight of Private Firms, *The Journal of Finance*, 1995, *50*(1), pp. 301-307; **Gompers and Lerner,** The Venture Capital Cycle; **Phalippou and Zollo,** What Drives Private Equity Fund Performance?

[136] **Kaplan, S.; Sensoy, B. and Strömberg, P.,** How Well do Venture Capital Databases Reflect Actual Investments?, 2002.

[137] **Thomson Financial,** Venture Xpert.

[138] Previous deals are mentioned, but with less reliability of data coverage.

3.1.2. Data collection

The database provides profiles of PE firms, funds and PF companies. Available investment data are listed in each profile. The deal information needed for analysis is not explicitly contained in the database. It must be derived and calculated by combining the profiles of the individual PE firms, funds and PF companies. The Model II research design, developed in Chapter B.2.1., governs the combining of these profiles and the necessary deal data as a single observable unit. Figure 13 illustrates the layout:

Figure 13: Combining information from empirical data
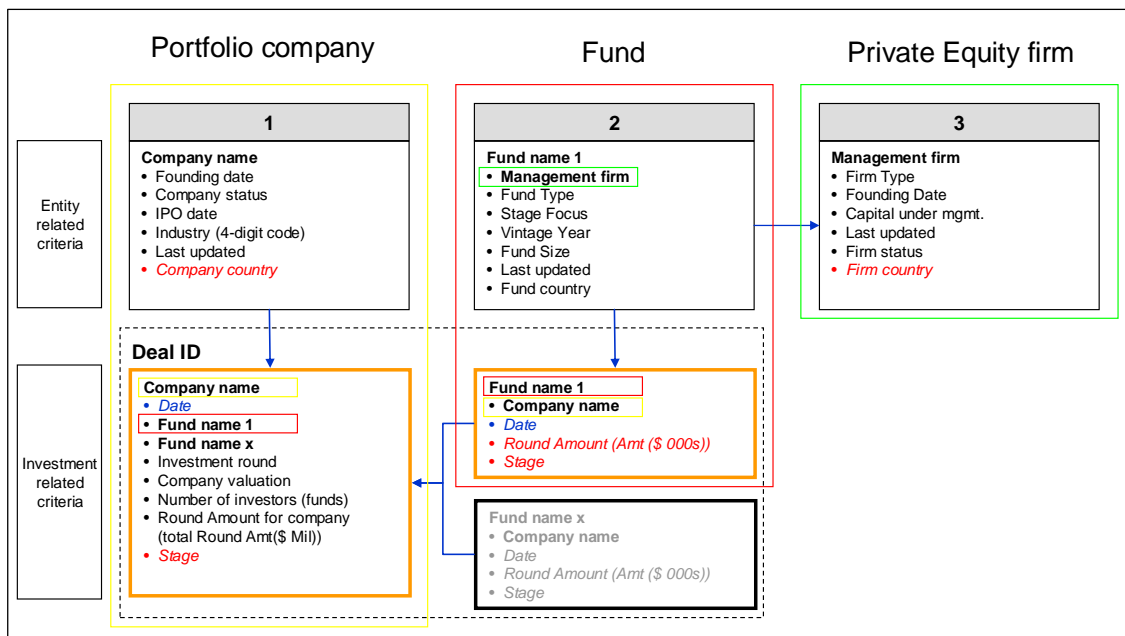
Schematically displayed are the profiles of PF company, fund, and PE firm as they appear in the Thomson database. Each profile lists entity and investment data, which relate the entities to each other.[139] The profiles relate to each other through key attributes, namely the PF company name (yellow border), fund name (red border), and management (PE) firm name (green border). PF company and fund profiles include time-specific deal information (blue) that specifically link these profiles. The paradigm deal contains core information for analyzing country

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[139]   See Appendix 1 for excerpts of the database profiles.

activity: date, participants (PF company and fund), stage, and amount invested by each fund (the crucial criteria are in italics). The smallest observation unit is the data in Deal ID (orange border): investment data of one PF company to one fund, which are part of one PF company deal (dashed border). The dependent variables are derived from Deal ID observations (see Figure 13).

Country information joins deal information by linking Deal ID to the PF company as well as via the funds to the PE firm country. Each deal is organized in a relational database, out of which the relevant analytical data (red, blue, italics) is aggregated with the information of PF company country, date, stage, investment round amount, and PE firm country.

The extraction and arrangement of data leads to a total of **244,461** deals between funds and PF companies.[140] The end result is a clean dataset of deals from 01/01/1946 to the last deal recorded on 05/15/2006, involving **7,475** management firms, **14,668** different funds, and **51,346** different PF companies, all related to each other by the detailed information listed above. Observations are missing if information has not been reported or the profile is not related to any firm, fund, or company. Further, observations may be missing due to dynamic database information changes during the long time period of the collection process.[141]

3.1.3. Data preparation

The extracted dataset is adjusted to meet analytical requirements and to calculate the PE-specific multi-investor country activity variables: participation, deal participation, deal flow, and activities expressed as a percentage, described in Chapter B.2.3.1. Due to concerns about the reliability of data quality,[142] the dataset is confined to the period from 1980 through 2005. Due to the relational linkage of the profiles, missing investor profiles led to gaps in deal information. In multi-investor deals, the specific information for the one particular missing

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[140] Only deal-relevant data is included; only those profiles with at least one related connection are included.

[141] Data has been collected through access to Thomson Financial. The data have been pulled online in packages of 99 profiles over a period of 30 days.

[142] See pre-analysis Chapter C.2.1 for time series and **Kaplan; Sensoy and Strömberg,** How Well do Venture Capital Databases Reflect Actual Investments?

investor cannot be calculated, so that only the remaining investor information, as a proportion of a total PF company deal, is included. A confidential, unreported round amount is included in the dataset and marked with a zero. After adjustments, the clean dataset has **207,131** deals between funds and PF companies, and **190,319** deals between management and PF companies. The dataset lists **6,963** different management firms, **13,708** different funds, and **37,461** different PF companies. The global reach is **99** countries with overall PE activity, covering **70** source countries and **95** host countries over a **26-year** span. The data matrix has **3,474** source / host / year combinations, with **712** different country pairs that are presented in the following deal activity matrix with **6,510** basic data fields.[143]

The matrix gives an overview of deal activity between countries over time by outlining the 70 source countries in columns and the 95 host countries in rows. The years are displayed as the sum of the years of deal activity between countries. Activity of more than 10 years (out of 26 years) is highlighted yellow and more than 20 years is in green. Domestic deals are framed and run diagonally. The matrix highlights that deal activity is not evenly distributed. The three main activity arrays are domestic deals and activity in the United States and the United Kingdom. Especially noticeable are the blank spots indicating no cross-border activity between countries.

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[143] The full matrix would have 70 x 95 x 26 = 172,900 data points.

Table 4: Data matrix of source-to-host activity by number of years

Source columns (1–70): Argentina, Australia, Austria, Belgium, Bermuda, Brazil, Bulgaria, Cameroon, Canada, Cayman Islands, Chile, China, Costa Rica, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Ghana, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland-Rep, Israel, Italy, Japan, Kuwait, Lithuania, Luxembourg, Madagascar, Malaysia, Mauritius, Mexico, Morocco, Netherlands, Netherlands Antilles, New Zealand, Nigeria, Norway, Pakistan, Philippines, Poland, Portugal, Romania, Russian Federation, Saudi Arabia, Senegal, Singapore, Slovak Republic, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Tunisia, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States of A., Vietnam

Host rows (1–95): Algeria, Argentina, Australia, Austria, Azerbaijan, Bangladesh, Belgium, Bermuda, Bolivia, Bosnia, Brazil, British Virgin, Bulgaria, Cameroon, Canada, Cayman Islands, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Dominica, Ecuador, Egypt, El Salvador, Estonia, Fiji, Finland, Fr Polynesia, France, Germany, Ghana, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland-Rep, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Latvia, Lithuania, Luxembourg, Macedonia, Malaysia, Mauritius, Mexico, Moldova, Monaco, Morocco, Mozambique, Netherlands, Netherlands Ant., New Zealand, Nicaragua, Nigeria, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Sierra Leone, Singapore, Slovak Republic, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States of A., Venezuela, Vietnam, Zambia

Legend: ▢ < 10   ▢ 10-20   ▢ >20   years

3.2.   Indicator data

The variety of explanatory country variables required collecting and consolidating information from different data sources. The main categories of variables and their sources in the academic literature are summarized in Table 5.

Table 5: Data sources for explanatory variables

A) Gravity model	Data sources
1) Economic mass related data:	WDI/IFS/EIU
2) Economic distance related variables:	CIA factbook/MS Mappoint
3) Country specific development related data	EIU/Worldbank/WDI

B) Private Equity related data	Data sources
1) Banking system	
1.1 Size	EIU/WDI/IFS/OECD
1.2 Efficiency	EIU/WDI/IFS/OECD
1.3 Stability	IFS
2) Endowment-related variables	
1.1 Skill variables and knowledge based	EIU/ World bank / WIPO
2.2 Other	EIU/WDI/IFS/OECD
3) Institutional/ legal/ political	
3.1 Institutional stability and quality	The Worldbank/Governance matters 3
3.2 Legal regimes and origin	CIA World factbook
3.3 Freedom	Freedomhouse/ The Heritage Foundation

Main sources for data	
Organisation	Database/ Report
The World Bank	World Development Indicators (WDI)
International Labour Organization (ILO)	
Organisation for Economic Co-operation and Development (OECD)	Bank Profitability Statistics
Central Intelligence Agency (CIA)	World fact book
International Monetary Fund (IMF)	International Financial statistiscs (IFS)
World Intellectual Property Organisation (WIPO)	Statistics
United Nations (UN)	
Freedomhouse	Freedom in the World
The Heritage Foundation	Index of economic freedom
Economic Intelligence Unit (EIU)	*Professional database for country data*

3.2.1. Database description

Institutions such as the OECD,[144] the International Financial Monetary Fund,[145] The World Bank,[146] the United Nations, and Eurostat provide several main databases with country-specific time series. These databases list a broad set of

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[144] **OECD,** OECD Factbook 2007, 2007; **OECD,** OECD Statistics of Foreign Trade, 2007.
[145] **International Monetary Fund,** International Financial Statistics, 2008, www.imfstatistics.org/imf.
[146] **World Bank Group,** WDI online, Washington, DC: World Bank Group.

statistical data with both basic and specific information. They vary in their global reach and time coverage. Basic variables, like population or GDP, are available from several databases.

Besides the more comprehensive sources, specialized datasets of time series exist to examine selected topics, such as freedom or governance indicators provided by Freedomhouse[147] and The Heritage Foundation,[148] or Governance Matters[149] from The World Bank.[150]

An advanced approach for data collection is to use a comprehensive umbrella database that consolidates data from several sources (OECD, World Bank, etc.) and avoids discrepancies. Such datasets are provided by the Economic Intelligence Unit (EIU), which composes information from more than a hundred national and international sources,[151] and verifies the information to ensure accuracy and consistency. Main EIU databases are: world data,[152] country data,[153] market indicators and forecasts,[154] and world investment services.[155]

The CIA's World Factbook[156] lists informative country profiles (with time-invariant country facts), which is especially useful for country pair indicators.

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[147] **Freedom House (U.S.),** Freedom in the World the Annual Survey of Political Rights and Civil Liberties.

[148] **Heritage Foundation (Washington D.C.) and Wall Street Journal (Firm),** Index of Economic Freedom.

[149] **Kaufmann; Kraay and Mastruzzi,** Governance Matters 2007 Worldwide Governance Indicators, 1996-2006.

[150] **World Intellectual Property Organization,** WIPO Industrial Property Statistics, 2007; **International Labour Organization,** LABORSTAT, 2007.

[151] OECD, Watson Wyatt, Zephyr, Eurostat, International Financial Statistics, UNCTAD.

[152] **Economic Intelligence Unit,** World Data, 2007. Combines the following databases (economic and industry forecasts of the EIU with updates from EcoWin): Comprehensive global database of economic and market figures, and forecasts on 150 countries with more than 120,000 series.

[153] **Economic Intelligence Unit,** Country Data, 2007. Delivers more than 320 economic series for each country from 1980 to 2010, covering 150 countries.

[154] **Economic Intelligence Unit,** Market indicators and forecast, 2007. Provides reliable data on market size and potential for the world's 60 largest markets.

[155] **Economic Intelligence Unit,** World Investment Service, 2007. Database containing flows of investment by country, industry, and by mergers and acquisitions.

[156] **Central Intelligence Agency,** The World Factbook, Washington, DC: Central Intelligence Agency, 2007.

3.2.2. Data collection

The time-invariant economic mass and distance indicators for the gravity model are taken from the CIA's World Factbook. These include latitude and longitude for distance measurement, land area as possible country mass measurement, languages spoken, legal system, currency, and political history as economic and cultural distance measurement. The bilateral indicators are derived by comparing the particular variables and yield indicators such as common language, common border, common history, etc.

The time-variant panel data are mainly taken from the EIU databases, with additional indicators from Freedomhouse, The Heritage Foundation, and The World Bank to establish the largest possible data coverage.

Equal availability for all relevant countries and years is hard to achieve. There are several variations in data coverage: First, indicators are directly provided by the database; second, they can be calculated from other indicators; and third, data cannot be derived and the reference must be omitted. Further, some indicators may be selected from different databases. The objective is to compose a reliable and consistent dataset with full coverage of indicators.

The precise steps used to align the PE datasets of 99 countries and relevant years of PE activity with the available data sources are:

1. Test if the needed indicator or basic data are provided by database

2. Verify that a country is listed in database

3. Check for relevant years (PE activity in a particular country in that year)

4. Assess if missing data for relevant years can be calculated (time series)

The result is a matrix of countries and indicators with gaps in the time series for each database. The databases and indicators are further tested and compared for maximum coverage and consistency.

Figure 14 illustrates the analytical results for selected variables from the EIU database country and market indicators.

Figure 14: Matrix of explanatory data availability for relevant years by country

Nr.	Country	Rel. Years	AVWG	BP01	BP04	BP15	BP17	BP18	BP22	CGDP	CRER	EXPS	FS01	FS09	GDPD	GDPL	IMPS	IRSP	MS02	MS13	NRPA	POPN	RDSP	RGDP	RPAP	SERD	SMN2	SODC	STMC	TCRP	XRPD	XRRE	YPCP	Total	Coverage
1	Algeria	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	1	0	1	1	1	0	0	1	1	1	25	81%
2	Argentina	11	11	10	10	10	9	10	9	11	11	11	9	10	11	11	11	11	11	11	3	11	8	11	3	8	11	11	11	10	11	11	11	307	90%
3	Australia	23	16	16	16	16	14	16	14	23	12	23	14	7	23	23	23	16	16	16	8	23	10	23	8	12	23	23	15	10	23	23	23	528	74%
4	Austria	12	11	11	11	11	9	11	9	12	10	12	10	6	12	12	12	8	11	11	6	12	9	12	6	5	12	12	10	10	12	12	12	319	86%
5	Azerbaijan	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2	2	2	1	2	2	2	2	59	95%
6	Bangladesh	1	0	0	0	0	0	0	0	1	0	1	0	0	1	1	1	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	1	12	39%
7	Belgium	17	13	13	13	13	11	13	11	17	11	12	11	7	17	17	12	13	13	13	7	17	11	17	7	12	14	14	12	10	17	17	17	402	76%
8	Bermuda	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
9	Bolivia	1	0	0	0	0	0	0	0	1	0	1	0	0	1	1	1	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	1	12	39%
10	Bosnia	1	0	0	0	0	0	0	0	1	0	1	0	0	1	1	1	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	1	12	39%
11	Brazil	13	12	11	11	11	10	11	10	13	12	13	13	9	13	13	13	9	13	13	8	13	8	13	8	2	13	13	11	13	13	13	13	351	87%
12	British Virgin	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
13	Bulgaria	4	4	4	4	4	3	4	3	4	4	4	4	4	4	4	4	4	4	4	2	4	2	4	2	3	4	4	4	4	4	4	4	115	93%
14	Cameroon	3	0	0	0	0	0	0	0	3	0	3	0	0	3	3	3	0	0	0	0	3	0	3	0	0	3	3	0	0	3	3	3	36	39%
15	Canada	26	16	16	16	16	14	16	14	26	12	26	10	8	26	26	26	16	16	16	8	26	14	26	8	13	26	26	15	6	26	26	26	562	70%
16	Cayman Islands	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
17	Chile	9	9	9	9	9	8	9	8	9	9	9	9	6	9	9	9	9	9	9	2	9	7	9	3	7	9	9	9	9	9	9	9	257	92%
⋮	⋮	⋮																																⋮	⋮
84	Sri Lanka	9	0	8	8	8	8	8	8	9	8	9	4	0	9	9	9	9	9	9	6	9	1	9	2	1	9	9	9	6	9	9	9	220	79%
85	Sweden	21	15	15	15	15	13	15	13	21	12	21	11	0	21	21	21	15	6	15	8	21	9	21	8	13	12	21	14	10	21	21	21	465	71%
86	Switzerland	25	15	15	15	15	13	15	13	25	12	25	10	0	25	25	25	13	15	15	8	25	7	25	8	8	25	25	14	10	25	25	25	521	67%
87	Taiwan	20	16	11	11	11	11	11	11	20	12	20	12	7	20	20	20	16	16	16	0	16	0	20	0	0	20	19	0	10	20	19	16	401	65%
88	Tanzania	2	0	0	0	0	0	0	0	2	0	2	0	0	2	2	2	0	0	0	0	2	0	2	0	0	2	2	0	0	2	2	2	24	39%
89	Thailand	16	15	11	11	11	10	11	10	16	12	16	5	5	16	16	16	15	15	15	5	16	11	16	5	9	16	16	15	10	16	16	16	393	79%
90	Tunisia	2	0	0	0	0	0	0	0	2	0	2	0	0	2	2	2	0	0	0	0	2	0	2	0	0	2	2	0	0	2	2	2	24	39%
91	Turkey	5	5	5	5	5	4	5	4	5	5	5	5	4	5	5	5	5	5	5	2	5	3	5	2	3	5	5	5	5	5	5	5	142	92%
92	Uganda	1	0	0	0	0	0	0	0	1	0	1	0	0	1	1	1	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	1	12	39%
93	Ukraine	8	8	6	6	6	6	5	6	8	8	8	8	3	8	8	8	8	8	8	5	8	5	8	5	6	8	8	7	6	8	8	8	216	87%
94	United Arab Emirates	3	0	0	0	0	0	0	0	3	0	3	0	0	3	3	3	0	0	0	0	3	0	3	0	0	3	3	0	0	3	3	3	36	39%
95	United Kingdom	26	16	16	16	16	14	16	14	26	12	26	11	0	26	26	26	16	9	16	8	26	14	26	8	9	24	19	15	10	26	26	26	551	68%
96	United States of A.	26	16	16	16	16	14	16	14	26	12	26	12	8	26	26	26	16	16	16	8	26	14	26	8	9	26	26	15	6	26	26	26	560	69%
97	Venezuela	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	28	90%
98	Vietnam	4	0	4	4	4	3	4	3	4	0	4	4	0	4	4	4	4	4	4	0	4	0	4	0	0	4	4	0	4	4	4	4	90	73%
99	Zambia	1	0	0	0	0	0	0	0	1	0	1	0	0	1	1	1	0	0	0	0	1	0	1	0	0	1	1	0	0	1	1	1	12	39%
	Total	953	627	584	583	582	490	576	508	910	539	875	472	271	907	907	875	617	623	636	315	899	426	910	300	421	870	890	591	459	911	908	887		69%
	Coverage		66%	61%	61%	61%	51%	60%	53%	95%	57%	92%	50%	28%	95%	95%	92%	65%	65%	67%	33%	94%	45%	95%	31%	44%	91%	93%	62%	48%	96%	95%	93%		

Legend: ▢ Data not available ▢ Data missing ▢ Full data coverage for relevant years

AVWG=Average wages (monthly, US$), **BP01**=Banking assets, **BP04**=Bank deposits, **BP15**=Loans/assets, **BP17**=Return on assets, **BP18**=Net interest margin (net interest inc/assets), **BP22**=Operating expenses/assets, **CGDP**=Real GDP (US$ at 1996 prices), **CRER**=Level of corruption (5=low), **EXPS**=Total exports fob, **FS01**=Number of banks, **FS09**=Concentration of top 10 banks by assets, **GDPD**=Nominal GDP (US$), **GDPL**=Nominal GDP, **IMPS**=Total imports cif, **IRSP**=Interest rate spread (lending minus deposit rate), **MS02**=Time and savings deposits, **MS13**=Total lending to the private sector, **NRPA**=Non-resident patents applications, **POPN**=Population, **RDSP**=R&D spending (% of GNP), **RGDP**=Real GDP, **RPAP**=Resident patents applications, **SERD**=Scientists & engineers in R&D (per m pop), **SMN2**=Stock of money M2, **SODC**=Stock of domestic credit, **STMC**=Stock market capitalisation (US$), **TCRP**=Top corporate tax rate (%), **XRPD**=Exchange rate LCU:US$ (av), **XRRE**=Real effective exchange rate (CPI-based), **YPCP**=GDP per head ($ at PPP)

This matrix shows a selection of country-specific panel data that are equivalent to the PE activity data, and compares data availability for the relevant year for source and host country. In column "0" are the number of years with PE activity listed for the particular country. Columns 1 to 31 are the indicators, with the available data points as the number of the relevant years available. "No data available" is highlighted in yellow, "full coverage" is green. The columns and rows **Total** and **Coverage** serve as quality indicators for data availability for the countries and the variables. **Total** adds up the number of relevant years and **Coverage** sets **Total** in relation to the required datapoints.

The matrix for a balanced dataset for all indicators without gaps, including all years, requires **131,274**[157] data points; the reduced matrix, focusing only on the relevant years, requires **48,603**[158] data points.

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[157] 99 countries x 26 years x 51 variables = 131,274.
[158] 953 relevant country / year observations x 51 variables = 48,603.

3.2.3. Data preparation

The following chapter first describes the method of data selection and calculation to get a full dataset of the required indicators. It then further describes the final explanatory data derivation and calculation.

3.2.3.1.   Data selection and adjustment

The analysis of the collected information (Figure 14) showed that some required variables are either not fully available or not available at all. Hence, the reliability of various indicators is inconsistent. The problem of one missing indicator is that it affects the whole variable combination of source, host, time, and indicator, and excludes each affected individual parameter from the regression due to zero values in the equation. As a result, the particular country, the indicator, and the year cannot be analyzed with the regression. Due to the complex three-dimensional data structure and the comprehensive indicator compilation, the analysis of the full set with the basic data (see gaps in matrix) is impossible.

The missing data points create a need for data enhancement and confinement. The result will be a reduced but reliable subset of variables that fully cover the explanatory variables to obtain a reliable analysis. To enhance the quantity of data points in the explanatory variables, the missing time series is interpolated. To ensure quality, the calculated data points are only considered if their number is above a reliable percentage of the total required.[159] The equation for interpolation is:

Equation 14: Missing data calculation for explanatory time series

$$a = \bar{y} - b\bar{x} \qquad \text{And:} \qquad b = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sum (x - \bar{x})^2}$$

Where x and y are the sample means of the known x's and y's, b is the slope and a the variable of interest.[160]

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[159] The legal / political / environmental indicators would not have been included due to missing data (reported years: 1996 through 2005).
[160] Microsoft Excel Manual.

The confinement process optimizes the data by balancing the coverage of the dependent variable with the explanatory variables at a maximum along all three dimensions — country, year, and indicators.

For the selection process, the relevance of each country, year, and variable has to be assessed to compare their relative importance to the data available for each variable. The following graph illustrates the method of data confinement by evaluating the importance of countries, years, and variables.

Figure 15: Overview of data selection (schematic)
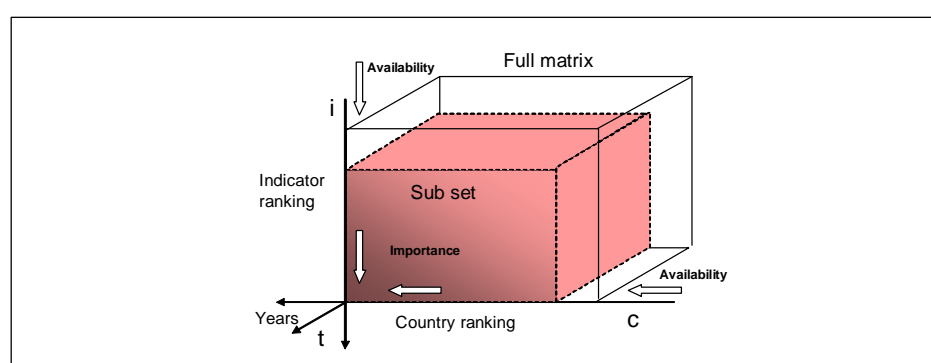
For the dependent variables, pre-analysis (Chapter C.2.) identifies the relevance of countries and years for both overall and cross-border activity. Countries are ranked by their percentage of overall PE activity to global activity (see Chapters B.2.3.1.2. and C.2.2.). Years are listed in a normal time series with the percentage of overall activity (see Chapter C.2.1.).

Assessing the explanatory variables is a selection process supported by the elbow criterion,[161] which expresses the information each variable adds to the analysis compared to the data available for each country and year. The optimized dataset of **overall deals** results in coverage for the years 1990 through 2005 of 38 countries, out of the top 43, with minimum total activity of 0.02%. Top countries not included due to lack of data are Taiwan, Bermuda, Luxembourg, Indonesia, and the Philippines. The set comprises **163,970** deals between funds and PF companies, and **152,088** (participation) deals between management and PF companies. In the set are **6,144** different management firms, **12,424** different

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[161] Variables sorted after sum of missing data from highest to lowest. Curve with significant "elbow".

funds, and **33,073** different PF companies. The data matrix has **2,682** source / host / year combinations with **490** different country pairs.[162] The coverage of the dependent variable is **80%** of participation, **84%** of deal participation, **93%** of deal flow, and 86% of activity compared to the full dataset. In absolute numbers — participation: **152,088**; deal participation: **77,645**; and deal flow: **$666,201 million**. The **cross-border** set (excluding domestic deals) lists **38** source and host countries. This set includes **22,591** deals between funds and PF companies, **21,260** (participation) deals between management and PF companies, as well as **2,363** different management firms, **4,188** different funds, and **9,109** different PF companies. The data matrix spans **2,266** source / host / year combinations with **453** different cross-border country pairs. The dataset covers 11% (13%)[163] of participation, 13% (14%) of deal participation, 20% (22%) of deal flow, and 15% (17%) of activity compared to the full dataset, with cross-border deals in all **99** countries over **26** years. In absolute numbers — participation: **21,260;** deal participation: **11,584**; and deal flow: **$141,429 million**. The resulting explanatory dataset is listed in the next chapter, in which the final variables are derived and calculated.

3.2.3.2.   Final explanatory variable derivation

The variables to be calculated that are not fully covered by databases are the indicators derived from the gravity model: geographical and economic distance measurements, and openness of imports and exports to GDP and development. Within the PE-derived dataset, the banking indicators M2 to GDP, private credit to GDP, bank assets to GDP, and lending minus deposit interest rates have to be calculated. The geographic distance between countries is computed with Equation 14 in nautical miles by using the countries' latitude and longitude to calculate the great circle distance between the capitals.[164]

Equation 15: Distance measurement between countries

$$dist_{ij} = r * \arccos(\sin(lat_i) * \sin(lat_j) + \cos(lat_i) * \cos(lat_j) * \cos(long_i - long_j))$$

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[162] The full matrix would have 70 x 95 x 26 = 172,900 data points.
[163] Cross-border deals for overall data set are listed in parentheses.
[164] where r is the earth radius (~3,444 nmi); lat and $long$ correspond to the source and host countries' latitude and longitude.

The data, obtained from the CIA World Factbook correspond to the coordinates of the capital city in each country.[165] The economic distance variables are derived by comparing country facts also provided by the CIA's World Factbook. Relevant variables are common language, common border, common history, common currency, and common legal system.

The development indicator is derived from the "world development indicators" income groups with low income = 1, middle income = 2, and high income = 3.

The following table shows the explanatory variables with their calculations and original data source for the gravity model-derived indicators and the PE-derived indicators.

Table 6: Explanatory variable set for statistical analysis (I)

Model	Indicator (calculation)	Data source
A) Gravity model indicators		
1) Economic mass related data:		
GDP	GDP	EIU/ Worldbank
Population	Population	EIU/ Worldbank
2) Economic distance related variables:		
Distance	Distance calculation	CIA factbook/MS Mappoint
Factors affecting the economic distance:		
Common language	Common language	CIA factbook
Common border	Common border	CIA factbook
Common history	Common history	CIA factbook
Common currency	Common currency	CIA factbook
Common legal system	Common legal system	CIA factbook
3) Country specific development related data		
Exchanger rates	Exchange rate (real CPI based)	EIU/IMF
Openness of im- and exports to GDP	(Exports + imports)/GDP	EIU National statistics
Development	Country income groups clustered	Worldbank

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[165] **Rose and Spiegel,** Offshore Financial Centers: Parasites or Symbionts?

Table 7: Explanatory variable set for statistical analysis (II)

Model	Indicator (calculation)	Data source
B) Private Equity related indicators		
1) Banking system		
1.1 Size		
M2 to GDP	M2/GDP	EIU/IFS
Private credit to GDP	Private credit/GDP	EIU/IFS
1.2 Efficiency		
Return on assets	Return on assets	EIU/ OECD Bank Proftability Report
Operating costs to total assets	Operating costs/total assets	EIU/ OECD Bank Proftability Report
Net interest margin	Net interest margin	EIU/ OECD Bank Proftability Report
1.3 Competitiveness		
Lending minus deposit interest rate spread	Lending - deposit interest rate spread	EIU/ OECD Bank Proftability Report
Number of banks per GDP	Number of banks/GDP	EIU
2) Endowment-related variables		
2.1 Scientific competitiveness		
Engineers and scientists per thousand	Engineers and scientists per mln pop	EIU/ World bank
Patents residential	Patents residential	EIU/World Intellectual Property Organisation
Patents non residential	Patents non residential	EIU/World Intellectual Property Organisation
2.2 Corporate economic conditions		
GDP per capita	GDP/Population	EIU/World bank
Wages in countries	Avg wages in country	EIU/ILO
Corporate tax rates	Corporate tax rates	EIU/OECD
2.3 Exit possibilities		
Stock market capitalization	Stock market capitalization	EIU/WDI/IFS
3) Institutional/ legal/ political		
3.1 Institutional stability and quality		
Rule of law	Rule of law	Worldbank/Governance matters 3
Political stability	Political stability	Worldbank/Governance matters 3
Regulatory quality	Regulatory quality	Worldbank/Governance matters 3
Control of corruption	Control of corruption	Worldbank/Governance matters 3
3.2 Legal regimes and origin		
Common law	Common law	CIA factbook
Civil law	Civil law	CIA factbook
Other	Other	CIA factbook
3.3 Freedom		
Political rights	Political rights	Freedomhouse
Civil rights	Civil rights	Freedomhouse
Economic freedom	Economic freedom	The Heritage Foundation

The final explanatory dataset is composed of two main categories: the gravity model-derived indicators and PE-related indicators. These are each further divided into three subcategories. The subcategory of the gravity model includes **11** indicators and the PE category — divided further into subcategories — has **24** explanatory variables. The datasets provide a total of **35** distinctive variables for statistical analysis.

4.   Summary of methodology for statistical analysis

A comprehensive theoretical foundation has been designed to empirically analyze cross-border PE investment activity.

First, the term *private equity* was clarified and defined due to different usages in the United States and Europe. Also defined were venture capital, private equity, and overall private equity investments.

To further strengthen the understanding of PE, its economic foundations have been examined by investigating the PE market structure through its participants, taking into account the life cycle of companies and the entire PE investment process.

The research design applied a relational system of interacting entities with reactive relationships over time. The countries are placed in a frame as non-mutually exclusive pairs in their dual roles as investors and as targets.

Relevant statistical methods are applied to the framework, first with the structural analyses of time series and cross-section, then panel data analysis and the gravity model, and finally the three-dimensional gravity model over time.

Furthermore, the dependent variables of cross-border activity and its determinants (independent variables) are conceptualized and quantified to ensure a sensible approach for analytical measurement. Four different dependent variables are derived: deal flow, participation, deal participation, and activity as a percentage, which are further diversified by deal type, considering the investment round, the number of participants, and the stage of the PF company in a particular deal. The data collection process for dependent and independent variables results in three basic datasets. First, the PE activity dataset, with overall coverage of **99** countries from the year 1980 through 2005. Second, the PE activity dataset aligned to the available explanatory dataset, with **38** countries and **2,266** source / host / year combinations for cross-border deals. Third, the explanatory dataset, with the categories economic mass, economic distance, country pair-specific indicators, banking system, endowment, and institutional / legal / political indicators, with a total of **35** different variables.

Having fulfilled the requirement of complete data coverage, the dataset can now be empirically analyzed.

C. Empirical analysis of private equity activity

1. Overview for empirical analysis

The empirical analysis of this thesis investigates PE cross-border investment patterns, with their underlying rules and norms, and to identify determinants that explain the affinity of countries participating in cross-border PE investment. The analytic process progresses from basic cross-section and time series analysis to the complex three-dimensional gravity model.

A *pre-analysis* explores initial results, verifies the quality of the empirical dataset, and aids in research design and explanatory data alignment. The *descriptive analysis* below investigates patterns and rules of PE activity along multiple dimensions with tabular analysis, and illustrates the patterns graphically. The final *explicative empirical analysis* — essentially the gravity model analysis with source, host, and year — identifies the variables, which explain the propensity of countries, and the affinity of country pairs, toward cross-border activity.

The complexity of the data analysis, especially the multidimensional gravity model with different perspectives, makes it necessary to perform the analysis gradually by focusing on the essential steps. To structure the data, successive model combinations (Chapter B.2.2.) are used, differentiated by the characteristics of the observation unit and various investment perspectives. Figure 16 illustrates the process in detail.

Figure 16: Analytical steps, model structure, and model diversification
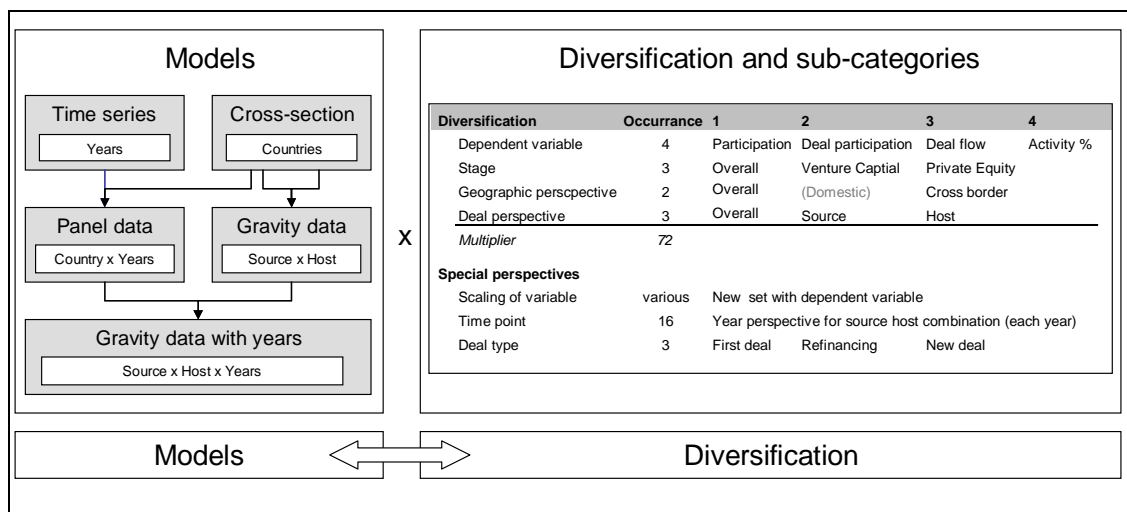
The models have a multidimensional structure, with the country cross-section and time-series as a foundation. The analytical steps build on each other to arrive at the final three-dimensional gravity model.

The **pre-analysis**, with time series and cross-sections, identifies source and host activity patterns over time and across individual countries. The analysis confirms the reliability of the collected empirical PE data in comparison with recent literature,[166] and ranks the countries and years by relevance to identify the important PE countries and to align the database with the explanatory country indicator data-sets for the explicative analysis.

The **descriptive analysis** investigates PE data along multiple dimensions. It is built upon the two-dimensional panel data model and the two-dimensional gravity model utilizing source and host country. The complexity of the gravity model, with its basic dimensions of source, host, and year, cannot be visualized in one graph while capturing all the dynamics of PE investment development. The basic panel model and the two-dimensional gravity model serve in combination as a foundation to analyze in depth the patterns of the three-dimensional gravity model. The descriptive analysis of the three-dimensional gravity model focuses on all dimensions (source, host, and time) and breaks down the data further to capture the dynamics of PE activity. The data are presented in tables, selected panel data series, and gravity models. Additionally, time series and cross-section graphs address special topics, such as deal type with partnering in cross-border activity.

The different models and the diversification into different dependent variables, along with the subcategories of finance stage, investment, and geographical perspective, etc., make it necessary to focus and confine the description to selected illustrative stepping stones, since the variety of the dimensions reaches more than **1,000** different possible combinations with tables and graphs. The path funnels the descriptive multidimensional analysis from a comprehensive overview of PE investments to detailed analysis. The illustrative graphs have been chosen after exhaustive analysis of the results. The focus is on overall investment (as the sum of VC and PE investment) without differentiating into the

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[166] **EVCA - European Venture Capital Association,** EVCA - Yearbook; **NVCA - National Venture Capital Association (USA),** National Venture Capital Association Yearbook.

different company stages of investment. For the panel data, the source country perspective is chosen to illustrate country activity. Further, the overall country deals — comparing domestic to cross-border deals — are illustrated. Country activity is shown, for deal flow, participation, and activity as a percentage.

The **explicative analysis** focuses on the three-dimensional gravity model with a breakdown of main and interaction effects of source, host, and year, performing first the analysis of variance (ANOVA) with dummy variables, and finally a gravity model analysis with a study of the different categories of explanatory variables.

2. Pre-analysis of private equity activity

The pre-analysis investigates the dynamics of PE across time and the impact of the individual countries for all PE-activity variables. The analysis examines the dataset with **99** countries for the **26** years from 1980 through 2005 across the two dimensions — countries and years — as time series and cross-section. The matrix accounts for **190,319** participations, **92,198** deal participations, **$719.95** billion of deal flow, and activity of 100%.

2.1. Investment activity over time

The time series is a fundamental analysis along the time dimension, investigating the development of PE accumulated by all countries in the sample. The analysis is diversified by the dependent variables of participation, deal participation, the stages of venture capital financing, PE, and overall activity, and for overall and cross-border activity. The following graph illustrates the analytic results of the investment pattern from 1980 through 2005 for finance stages and for overall and cross-border investments with the dependent variables. The *y*-axis has a different scale to illustrate the patterns of investment in relative terms.

Figure 17: Overview of investment development over time
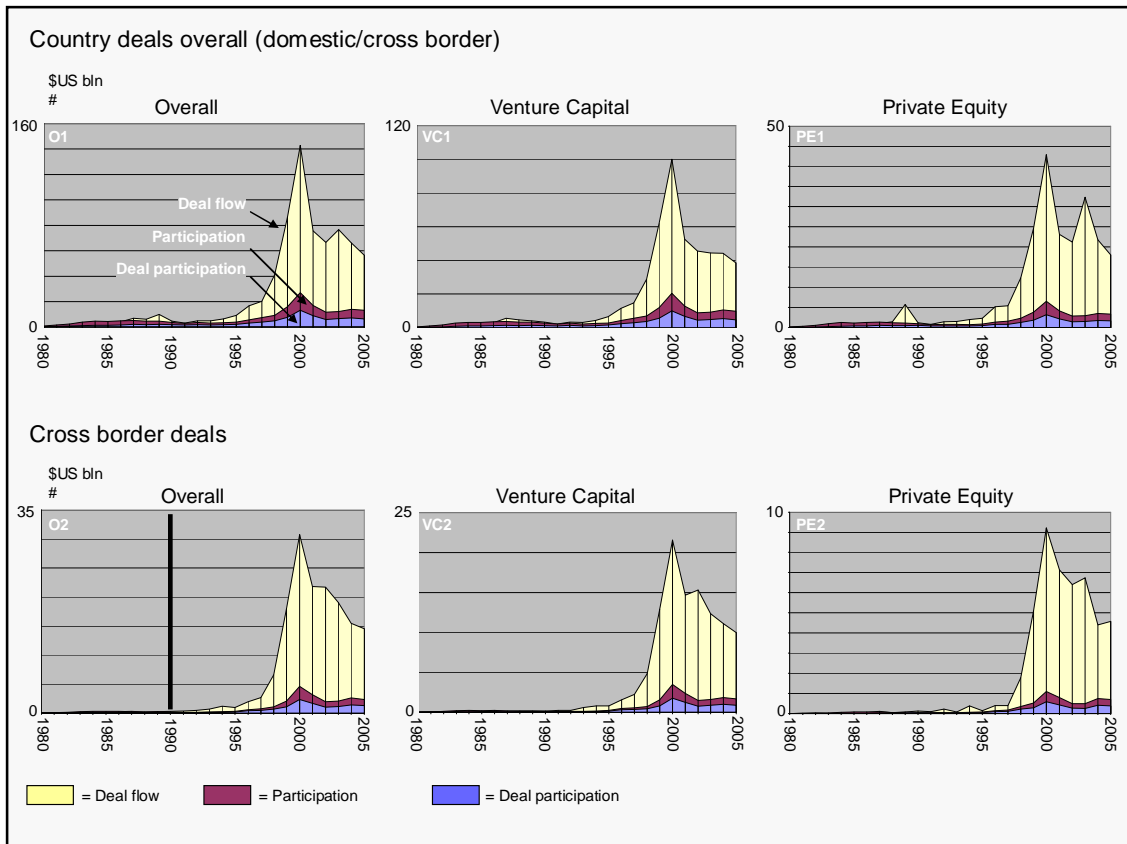
The comparison of country deals overall (Graph O1) to cross-border investments (Graph O2) shows that domestic investments make up the largest portion of deals; differentiated into finance stages, VC is the largest part. Generally, the patterns indicate an exponential growth rate from the year 1990 on (in relative numbers), with rapid growth reaching its peak between the years 1997 and 2000. The rate of decline, though sharp, is not as dramatic as the rate of growth to the peak. It levels out not lower, as in the year 1998 for the cross-border deals. The patterns after the year 2000 indicate different dynamics for VC and PE, with both further diversified into total and cross-border deals.

When focusing on overall deal activity and deal flow (Graph O1), the curve has two peaks; with an absolute maximum in 2000 and a relative maximum in 2003. The year with the largest growth is 1999. The differentiation of overall activity into VC (VC1) and PE (PE1) reveals that the second peak is caused by PE activity compared to VC, with only one peak in 2000.

The time-series amplitude of cross-border deals is less distinctive, caused by a lower rate of decline. With a few cross-border deals from 1980 through 1992, significant growth started in 1995 with the largest rates in 1999, reaching a peak at 2000. The dependent variables participation and deal participation, with their peak in 2000, have a distribution similar to deal flow across time. The relation of the measurable variables participation and deal participation, calculated for country deals overall, increases from 1.5 in 1995 to 1.9 in 2000, indicating a shift toward mixed deals with partnering in the growth period.

The analysis of time series indicates a highly dynamic situation, with an exponential growth rate until the year 2000 and volatile development for the distinct segments in the following years. Volatile development provides evidence of the necessity to diversify the research into the different finance stages of VC and PE, and to investigate countries in relation to their domestic investment behavior. The dynamics illustrate that the analysis should focus on the period 1990 through 2005 to compare the early phase (1990–1995) with the boom (1995–1999), the peak (2000) and the downturn (2000–2005), each with a different pattern of PE and VC activity. As proof of reliability, the time-series patterns have been compared and correspond to results of deal flow development in data sources (Merger Market, Zephyr) and statistics of associations (EVCA, NVCA, BvK).[167]

2.2.   Investment activity by country — cross-section

The cross-sectional analysis identifies the importance of each country by overall, source, and host investments. The first table is a general analysis of domestic and cross-border deals combined, while the second table focuses on cross-border activity only (see Chapter B.2.3.1.). The tables for the differentiation into VC and PE are listed in the appendix.

Analyzed are the 99 countries from 1980 through 2005 by the different dependent variables of participation, deal participation, deal flow, and activity.

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[167]   EVCA: European Venture Capital Association; NVCA: National Venture Capital Association; BvK: Bundesverband Deutscher Kapitalbeteiligungsgesellschaften.

The countries are ranked by their overall activity expressed as a percentage, which is calculated by proportional activity from participation, deal participation, and deal flow (see Chapter B.2.3.1.). The ranking by activity as a percentage of all dependent variables allows a comparison of countries with different investment behaviors, such as less frequency (participation) and high intensity (deal flow). The activity as a percentage signifies total PE activity over the last 26 years and over all countries. The tables additionally list the rank of source and host country, illustrating the importance of a country as source and host from a global perspective. Further, the tables display the difference between source and host activity within a country, illustrating the country' net balance of import to export deals.

2.2.1. Overall country investment activity

The cross-section analyzes each country by overall country activity, accumulated over the years 1980 through 2005, and ranked by total activity, with a total of **99** countries, **70** as source and **95** as host countries of investment. The following table lists the countries in column 2 with the country selection for the explicative analysis, which is highlighted in green. The rank of the country is displayed in columns 3 and 4 for overall (O), source (S), and host country (H), followed by the difference of global country rank between source and host (column 6).

The absolute dependent variables — participation, deal participation, and deal flow — are listed in columns 7 to 15, broken down by investment perspectives of overall, source, and host PE-country investment. Columns 16 to 18 display the net ratio of source to host activity for each dependent variable, defining a country as net importer or net exporter of PE investment: the number is negative for inward flow and positive for outward flow.

Positive or negative signs for flows for one country occur because of the relation of the number of investors to the deal size. The United States, for example, has a negative ratio in source / host participation and a positive ratio of source / host deal participation and deal flow, indicating that relatively few companies with many deals and large capitalization invest abroad; whereas many companies invest small amounts in the United States.

The activity as a percentage, and the proportional PE activity of each country to global activity, are presented in columns 19 to 27 for each dependent variable by overall, source, and host investment.

Table 8: Country activity overview of domestic and cross-border deals

Nr.	Country	Rank O	S	H	Dif	Overall (Source+Host) Part.	Dealp.	Dflow	Source Part.	Dealp.	Dflow	Host Part.	Dealp.	Dflow	Diff. source-host Part.	Dealp.	Dflow	Overall Part.	Dealp.	Dflow	Source Part.	Dealp.	Dflow	Host Part.	Dealp.	Dflow	Activity % Source	Host	Overall
1	United States of A.	1	1	1	0	306,246	135,944	1,092,193	152,179	68,455	564,872	154,067	67,489	527,322	-1,888	966	37,550	80.5%	73.7%	75.9%	80.0%	74.2%	78.5%	81.0%	73.2%	73.2%	77.56%	75.80%	76.68%
2	United Kingdom	2	2	2	0	18,188	12,114	126,645	10,582	6,816	74,240	7,606	5,298	52,405	2,976	1,518	21,835	4.8%	6.6%	8.8%	5.6%	7.4%	10.3%	4.0%	5.7%	7.3%	7.75%	5.67%	6.71%
3	France	3	3	3	0	9,624	5,609	33,395	4,483	2,541	11,111	5,141	3,068	22,283	-658	-528	-11,172	2.5%	3.0%	2.3%	2.4%	2.8%	1.5%	2.7%	3.3%	3.1%	2.22%	3.04%	2.63%
4	Germany	4	4	4	0	5,806	3,480	20,223	2,792	1,522	6,398	3,014	1,958	13,825	-222	-436	-7,427	1.5%	1.9%	1.4%	1.5%	1.7%	0.9%	1.6%	2.1%	1.9%	1.34%	1.88%	1.61%
5	Canada	5	5	5	0	5,150	2,388	16,551	2,625	1,105	8,132	2,525	1,283	8,419	100	-178	-288	1.4%	1.3%	1.1%	1.4%	1.2%	1.1%	1.3%	1.4%	1.2%	1.24%	1.30%	1.27%
6	Australia	6	6	6	0	3,893	3,156	10,156	1,978	1,539	4,904	1,915	1,567	5,252	63	22	-347	1.0%	1.7%	0.7%	1.0%	1.7%	0.7%	1.0%	1.7%	0.7%	1.15%	1.15%	1.15%
7	South Korea	7	7	7	0	3,036	2,348	9,071	1,439	1,110	2,001	1,597	1,238	7,069	-158	-128	-5,068	0.8%	1.3%	0.6%	0.8%	1.2%	0.3%	0.8%	1.3%	1.0%	0.75%	1.05%	0.90%
8	Sweden	8	8	8	0	2,716	1,863	9,709	1,239	835	4,827	1,477	1,028	4,882	-238	-193	-56	0.7%	1.0%	0.7%	0.7%	0.9%	0.7%	0.8%	1.1%	0.7%	0.74%	0.86%	0.80%
9	Netherlands	9	9	10	1	2,258	1,430	12,925	1,215	755	5,391	1,043	675	7,533	172	79	-2,142	0.6%	0.8%	0.9%	0.6%	0.8%	0.7%	0.5%	0.7%	1.0%	0.74%	0.78%	0.76%
10	India	10	12	9	-3	2,151	1,928	6,758	954	857	1,757	1,197	1,071	5,001	-243	-213	-3,244	0.6%	1.0%	0.5%	0.5%	0.9%	0.2%	0.6%	1.2%	0.7%	0.56%	0.83%	0.69%
11	Israel	11	10	12	2	2,566	1,213	6,101	1,358	586	3,193	1,237	627	2,907	121	-41	286	0.7%	0.7%	0.4%	0.7%	0.6%	0.4%	0.6%	0.7%	0.4%	0.60%	0.58%	0.59%
12	Japan	12	13	11	-2	1,342	726	12,925	853	347	4,992	489	379	7,934	364	-32	-2,942	0.4%	0.4%	0.9%	0.4%	0.4%	0.7%	0.3%	0.4%	1.1%	0.51%	0.59%	0.55%
13	Finland	13	14	13	-1	1,763	1,421	3,376	861	697	1,389	902	724	1,987	-11	-27	-599	0.5%	0.8%	0.2%	0.5%	0.8%	0.2%	0.5%	0.8%	0.3%	0.47%	0.51%	0.49%
14	Hong Kong	14	11	23	12	1,021	715	9,472	625	432	6,693	396	283	2,779	229	149	3,914	0.3%	0.4%	0.7%	0.3%	0.5%	0.9%	0.2%	0.3%	0.4%	0.58%	0.30%	0.44%
15	Switzerland	15	16	17	1	1,627	904	5,299	910	483	2,185	717	421	3,113	193	62	-928	0.4%	0.5%	0.4%	0.5%	0.5%	0.3%	0.4%	0.5%	0.4%	0.44%	0.42%	0.43%
16	Denmark	16	18	14	-4	1,497	979	4,466	701	458	1,008	796	521	3,458	-95	-63	-2,450	0.4%	0.5%	0.3%	0.4%	0.5%	0.1%	0.4%	0.6%	0.5%	0.33%	0.49%	0.41%
17	Singapore	17	15	21	6	1,196	694	7,154	790	383	4,022	406	311	3,132	384	73	891	0.3%	0.4%	0.5%	0.4%	0.4%	0.6%	0.2%	0.3%	0.4%	0.46%	0.33%	0.40%
18	Belgium	18	17	18	1	1,358	816	4,162	745	420	1,481	613	396	2,681	132	24	-1,200	0.4%	0.4%	0.3%	0.4%	0.5%	0.2%	0.3%	0.4%	0.4%	0.35%	0.37%	0.36%
19	Ireland-Rep	19	22	16	-6	1,045	694	4,622	428	296	575	617	399	4,047	-189	-103	-3,471	0.3%	0.4%	0.3%	0.2%	0.3%	0.1%	0.3%	0.4%	0.6%	0.21%	0.44%	0.32%
20	Italy	20	21	19	-2	760	546	5,377	346	227	1,502	414	319	3,874	-68	-92	-2,372	0.2%	0.3%	0.4%	0.2%	0.2%	0.2%	0.2%	0.3%	0.5%	0.21%	0.37%	0.29%
21	China	21	26	15	-11	803	482	4,786	182	116	365	621	366	4,421	-439	-250	-4,056	0.2%	0.3%	0.3%	0.1%	0.1%	0.1%	0.3%	0.4%	0.6%	0.09%	0.45%	0.27%
22	Taiwan	22	19	25	6	996	636	2,748	671	363	1,716	325	273	1,032	346	91	684	0.3%	0.3%	0.2%	0.4%	0.4%	0.2%	0.2%	0.3%	0.1%	0.33%	0.20%	0.27%
23	Brazil	23	20	24	4	661	561	4,439	289	254	1,819	372	307	2,620	-83	-54	-801	0.2%	0.3%	0.3%	0.2%	0.3%	0.3%	0.2%	0.3%	0.4%	0.23%	0.30%	0.26%
24	Spain	24	24	22	-2	686	504	4,039	237	183	1,361	449	321	2,678	-212	-138	-1,317	0.2%	0.3%	0.3%	0.1%	0.2%	0.2%	0.2%	0.3%	0.4%	0.17%	0.32%	0.24%
25	Norway	25	23	26	3	714	519	1,772	394	277	788	320	243	984	74	34	-196	0.2%	0.3%	0.1%	0.2%	0.3%	0.1%	0.2%	0.3%	0.1%	0.21%	0.19%	0.20%
26	Bermuda	26	42	20	-22	132	57	6,412	15	10	62	117	47	6,350	-102	-36	-6,288	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.1%	0.1%	0.9%	0.01%	0.33%	0.17%
27	Austria	27	25	28	3	486	350	723	198	151	208	288	199	515	-90	-48	-307	0.1%	0.2%	0.1%	0.1%	0.2%	0.0%	0.2%	0.2%	0.1%	0.10%	0.15%	0.12%
28	Luxembourg	28	29	27	-2	184	100	3,487	133	68	538	51	32	2,949	82	36	-2,411	0.0%	0.1%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	0.4%	0.07%	0.16%	0.11%
29	New Zealand	29	27	29	2	297	259	1,020	135	116	233	162	143	786	-27	-27	-553	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%	0.2%	0.1%	0.08%	0.12%	0.10%
30	Poland	30	30	30	0	270	245	627	116	105	232	154	140	395	-38	-35	-164	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%	0.2%	0.1%	0.07%	0.10%	0.08%
31	Malaysia	31	28	32	4	272	212	523	151	106	186	121	106	337	30	0	-151	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.07%	0.08%	0.07%
32	Czech Republic	32	32	35	3	192	162	510	90	78	144	102	84	366	-12	-6	-222	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%	0.1%	0.1%	0.1%	0.05%	0.07%	0.06%
33	South Africa	33	31	37	6	143	110	1,021	65	54	487	78	57	534	-13	-3	-47	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	0.05%	0.06%	0.06%
34	Indonesia	34	37	33	-4	111	83	985	29	18	241	82	66	743	-53	-48	-502	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.02%	0.07%	0.05%
35	Portugal	35	33	38	5	153	125	438	66	57	98	87	68	339	-21	-11	-241	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.04%	0.06%	0.05%
36	Thailand	36	39	34	-5	131	127	457	33	32	65	98	95	392	-65	-63	-328	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.02%	0.07%	0.05%
37	Argentina	37	49	31	-18	96	58	1,115	8	6	8	88	52	1,107	-80	-46	-1,099	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.00%	0.09%	0.04%
38	Hungary	38	36	36	0	149	122	332	48	40	28	101	82	304	-53	-42	-276	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.02%	0.06%	0.04%
39	Russian Federation	39	34	41	7	118	97	295	65	48	131	53	49	163	12	-1	-32	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.03%	0.03%	0.03%
40	Philippines	40	40	39	-1	90	67	469	29	15	49	61	52	420	-32	-37	-371	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.01%	0.05%	0.03%
41	Mexico	41	70	43	-30	48	41	327	1	0	0	47	41	327	-46	-41	-327	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.00%	0.04%	0.02%
42	Romania	42	45	42	-3	50	44	263	10	10	30	40	34	232	-30	-24	-202	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.03%	0.02%
43	Greece	43	38	47	9	48	39	305	28	23	182	20	16	122	8	7	60	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.02%	0.01%	0.02%
44	Mauritius	44	35	90	55	52	36	162	51	35	162	1	1	0	50	34	162	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.03%	0.00%	0.01%
45	Vietnam	45	41	50	9	40	40	42	19	19	19	21	21	23	-2	-2	-4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.01%	0.01%
46	Bulgaria	46	58	43	-15	24	15	227	3	3	0	21	12	227	-18	-9	-227	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
47	Nigeria	47	48	46	-2	22	19	191	8	7	9	14	12	182	-6	-5	-173	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.01%	0.01%
48	Iceland	48	44	51	7	35	26	72	13	12	19	22	14	54	-9	-2	-35	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.01%	0.01%
49	Chile	49	63	44	-19	25	19	166	3	1	0	22	18	166	-19	-16	-166	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
50	Cayman Islands	50	46	49	3	18	9	268	15	6	26	3	3	241	12	3	-215	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.01%	0.01%
51	Slovak Republic	51	50	48	-2	32	29	35	6	6	3	26	23	32	-20	-17	-30	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
52	Ukraine	52	43	55	12	29	29	20	16	16	6	13	13	14	3	3	-8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.01%	0.01%
53	Zambia	53	0	45	0	2	2	325	0	0	0	2	2	325	-2	-2	-325	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
54	Sri Lanka	54	55	52	-3	21	21	38	4	4	0	17	17	37	-13	-13	-37	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
55	Lithuania	55	56	56	0	15	13	51	4	4	0	11	9	51	-7	-5	-51	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
56	Estonia	56	62	54	-8	13	11	58	3	1	3	10	10	56	-7	-9	-53	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
57	Turkey	57	53	60	7	14	13	26	5	5	0	9	8	26	-4	-4	-26	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
58	Kenya	58	0	53	0	15	10	42	0	0	0	15	10	42	-15	-10	-42	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
59	Pakistan	59	54	59	5	11	10	52	4	4	0	7	6	52	-3	-2	-52	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
60	Croatia	60	0	57	0	12	12	21	0	0	0	12	12	21	-12	-12	-21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
61	Netherlands Antilles	61	47	66	19	13	12	12	8	8	8	5	4	5	3	4	3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.00%	0.00%
62	Cyprus	62	67	58	-9	7	7	62	1	1	0	6	6	61	-5	-5	-61	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
63	United Arab Emirates	63	51	65	14	8	8	39	4	4	23	4	4	17	0	0	6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
64	Ghana	64	66	62	-4	10	10	5	1	1	0	9	9	4	-8	-8	-4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
65	Tanzania	65	0	61	0	2	2	94	0	0	0	2	2	94	-2	-2	-94	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
66	Morocco	66	59	67	8	7	5	21	3	2	5	4	3	15	-1	-1	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
67	Colombia	67	0	63	0	3	2	46	0	0	0	3	2	46	-3	-2	-46	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
68	Cameroon	68	57	73	16	6	6	3	3	3	1	3	3	1	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
69	Moldova	69	0	64	0	6	6	1	0	0	0	6	6	1	-6	-6	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
70	Madagascar	70	52	0	0	9	3	9	9	3	9	0	0	0	9	3	9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
71	British Virgin	71	0	68	0	3	2	25	0	0	0	3	2	25	-3	-2	-25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
72	Monaco	72	0	69	0	5	4	0	0	0	0	5	4	0	-5	-4	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
73	Tunisia	73	61	79	18	4	4	2	2	2	1	2	2	1	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
74	Jordan	74	0	70	0	3	3	11	0	0	0	3	3	11	-3	-3	-11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
75	Ecuador	75	0	71	0	1	1	28	0	0	0	1	1	28	-1	-1	-28	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
76	Egypt	76	0	72	0	3	2	10	0	0	0	3	2	10	-3	-2	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
77	Latvia	77	0	74	0	3	3	0	0	0	0	3	3	0	-3	-3	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
78	Fr Polynesia	78	0	75	0	3	3	0	0	0	0	3	3	0	-3	-3	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
79	El Salvador	79	0	76	0	2	2	10	0	0	0	2	2	10	-2	-2	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
80	Slovenia	80	64	90	26	3	2	1	2	1	1	1	1	0	1	0	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
81	Bangladesh	81	0	77	0	1	1	18	0	0	0	1	1	18	-1	-1	-18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
82	Kazakhstan	82	0	78	0	2	2	5	0	0	0	2	2	5	-2	-2	-5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
83	Senegal	83	60	0	0	2	2	2	2	2	2	0	0	0	2	2	2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
84	Azerbaijan	84	0	80	0	2	2	0	0	0	0	2	2	0	-2	-2	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
85	Costa Rica	85	68	90	22	2	2	0	1	1	0	1	1	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
86	Fiji	85	0	81	0	2	2	0	0	0	0	2	2	0	-2	-2	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
87	Peru	87	0	82	0	1	1	10	0	0	0	1	1	10	-1	-1	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
88	Saudi Arabia	88	65	0	0	2	1	0	2	1	0	0	0	0	2	1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
89	Algeria	89	0	83	0	1	1	4	0	0	0	1	1	4	-1	-1	-4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
90	Bolivia	90	0	84	0	1	1	3	0	0	0	1	1	3	-1	-1	-3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
91	Macedonia	91	0	85	0	1	1	2	0	0	0	1	1	2	-1	-1	-2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
92	Mozambique	92	0	86	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
93	Sierra Leone	93	0	87	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
94	Venezuela	94	0	88	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
95	Bosnia	95	0	89	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
96	Dominica	96	0	90	0	1	1	0	0	0	0	1	1	0	-1	-1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
97	Kuwait	96	68	0	0	1	1	0	1	1	0	0	0	0	1	1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
98	Nicaragua	96	0	90	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
99	Uganda	96	0	90	0	1	1	0	0	0	0	1	1	0	-1	-1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
	Grand Total					380,638	184,395	1,439,891	190,319	92,198	719,945	190,319	92,198	719,945													100%	100%	100%

Columns 28 to 30 present the average proportion of global activity as a percentage of the dependent variable for each investment perspective.[168] Overall activity (column 30) expresses the general relevance of a country as source and host combined — the indicator for the country ranking for the analysis.

The analysis covers **99** countries with **70** source and **95** host perspectives. Comparing the range of the absolute dependent variables (columns 7–15) between countries shows how widely countries differ in their absolute PE activity. Countries also vary in their relevance as source and host of investment, indicated by the country ranking (columns 4 and 5), the net ratio of investments (columns 16–18), and the activity as a percentage (columns 28 and 29). Comparing the dependent variables as absolute (columns 7–15) or relative numbers (columns 19–27) in each country verifies that countries vary widely in the ratio of the number of deals (frequency) to deal size (intensity), and the number of investors. The six most important countries are the United States, United Kingdom, France, Germany, Canada, and Australia. Their combined PE activity is highly concentrated. The United States, with nearly 77% of all PE activity, is by far the most active country, followed by the United Kingdom, with nearly 7%. France, Germany, Canada, and Australia account for between 1% and 3% of overall activity. Comparing the rankings of source and host activity, each of the top eight countries, including South Korea and Sweden, assign their global rank position for all investment perspectives. Other countries differ in their global rank as source and host in a range from positive 55 for Mauritius and negative 30 for Mexico. A country with only source or host activity is indicated by a zero.

Investigating the countries by different activity measures the United States, United Kingdom, and France rank highest by all variables. Germany, Canada, and Australia rank differently in the subcategories of activity variables, indicating that an overall lower ranked country actually has greater activity in this subsegment. The first two inverse rankings are highlighted in red for each activity variable. The comparison of an activity by percentage for each variable (columns 19–27) illustrates the differences in the subsegment. The absolute numbers are highlighted in the differences of source and host activity (columns 16–18).

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[168] Calculated by Average of Overall Participation (C19), Overall Deal participation (C20), and Deal flow (C21).

For example, the United States accounts for 80.5% of total participation, with 80% as source and 81% as host country. Deal participation for the US is the lowest segment, with 73.2% for host and 74.2% as source country. While the difference in these variables is very close — less than 1% — the comparison of deal flow, with 78.5% for source and 73.2% for host of total global deal flow, shows a gap of more than 5%, indicating the dominance of the US as source country for deal flow.

The United Kingdom has a different profile. The ratio of the dependent variable, with deal flow 10.3% for source and 7.3% for host of global activity, is the largest segment. For the UK, deal participation, with 7.4% for source and 5.7% for host, is larger than 5.6% source and 4.0% host for participation. The table shows the detailed results for each country. The results of the overall investment analysis indicate a difference in country characteristics for PE investment along all activity variables and across the source / host perspective, indicating differences in deal flow and partnering. Further, overall PE is highly concentrated in the US. This analysis confirms the research design that the diversification into different dependent variables is necessary to capture factors in country activity not recognized by deal flow analysis alone. The analysis further identifies the relevant top 43 countries, with an absolute minimum of 0.02% activity for the explicative data analysis, in which 38 countries (highlighted in green) are used, with this subset of countries still covering a large proportion of total global country activity.

2.2.2. Cross-border investment activity

The cross-section matrix on cross-border activity is similar to overall country activity, covering **99** countries in the years 1980 through 2005. The table shows only **97** countries diversified into **59** source and **93** host countries because Cameroon and Tunisia are not listed with cross-border deals. The matrix accounts for **24,807** participations, **13,231** deal participations, **$158.28** billion of deal flow, and **16.5%** of global PE activity.

This table's layout, identical to the previous overall country table, compares overall investment activity to the cross-border activity of the relevant countries.

Table 9: Country activity overview of cross-border deals

Nr	Country	O	S	H	Dif	Overall (Source+Host) Part.	Dealp.	Dflow	Source Part.	Dealp.	Dflow	Host Part.	Dealp.	Dflow	Diff. src-host Part.	Dealp.	Dflow	Pct Overall Part.	Dealp.	Dflow	Pct Source Part.	Dealp.	Dflow	Pct Host Part.	Dealp.	Dflow	CB Source	CB Host	CB Overall
1	United States of A.	1	1	1	0	18,042	8,790	113,213	8,077	4,878	75,381	9,965	3,912	37,831	-1,888	966	37,550	36.4%	33.2%	35.8%	32.6%	36.9%	47.6%	40.2%	29.6%	23.9%	39.02%	31.21%	35.12%
2	United Kingdom	2	2	2	0	7,852	4,421	56,906	5,414	2,969	39,371	2,438	1,451	17,535	2,976	1,518	21,835	15.8%	16.7%	18.0%	21.8%	22.4%	24.9%	9.8%	11.0%	11.1%	23.05%	10.63%	16.84%
4	Germany	3	3	4	1	2,866	1,521	15,127	1,322	543	3,850	1,544	978	11,277	-222	-436	-7,427	5.8%	5.7%	4.8%	5.3%	4.1%	2.4%	6.2%	7.4%	7.1%	3.95%	6.91%	5.43%
3	France	4	5	3	-2	2,692	1,399	16,869	1,017	436	2,848	1,675	963	14,020	-658	-528	-11,172	5.4%	5.3%	5.3%	4.1%	3.3%	1.8%	6.8%	7.3%	8.9%	3.06%	7.63%	5.35%
5	Canada	5	4	5	1	2,284	949	10,703	1,192	385	5,208	1,092	563	5,495	100	-178	-288	4.6%	3.6%	3.4%	4.8%	2.9%	3.3%	4.4%	4.3%	3.5%	3.67%	4.04%	3.86%
9	Netherlands	6	6	6	0	1,314	723	11,338	743	401	4,598	571	322	6,740	172	79	-2,142	2.6%	2.7%	3.6%	3.0%	3.0%	2.9%	2.3%	2.4%	4.3%	2.98%	3.00%	2.99%
11	Israel	7	9	10	1	1,623	649	3,526	772	304	1,906	851	345	1,620	121	-41	286	2.9%	2.5%	1.1%	3.1%	2.3%	1.2%	2.6%	2.6%	1.0%	2.20%	2.08%	2.14%
12	Japan	8	11	9	-2	1,046	501	7,591	705	235	2,324	341	266	5,267	364	-32	-2,942	2.1%	1.9%	2.4%	2.8%	1.8%	1.5%	1.4%	2.0%	3.3%	2.03%	2.24%	2.13%
15	Switzerland	9	10	11	1	1,177	624	4,652	685	343	1,862	492	281	2,790	193	62	-928	2.4%	2.4%	1.5%	2.8%	2.6%	1.2%	2.0%	2.1%	1.8%	2.18%	1.96%	2.07%
8	Sweden	10	13	7	-6	1,032	650	4,951	397	229	2,448	635	422	2,503	-238	-193	-56	2.1%	2.5%	1.6%	1.6%	1.7%	1.5%	2.6%	3.2%	1.6%	1.62%	2.44%	2.03%
14	Hong Kong	11	7	21	14	765	509	7,601	497	329	5,758	268	180	1,843	229	149	3,914	1.5%	1.9%	2.4%	2.0%	2.5%	3.6%	1.1%	1.4%	1.2%	2.71%	1.20%	1.96%
17	Singapore	12	8	18	10	928	490	5,951	656	281	3,421	272	209	2,530	384	73	891	1.9%	1.9%	1.9%	2.6%	2.1%	2.2%	1.1%	1.6%	1.6%	2.31%	1.42%	1.87%
6	Australia	13	12	16	4	801	566	3,339	432	294	1,496	369	272	1,843	63	22	-347	1.6%	2.1%	1.1%	1.7%	2.2%	0.9%	1.5%	2.1%	1.2%	1.64%	1.57%	1.60%
18	Belgium	14	15	20	5	706	352	3,454	419	188	1,127	287	164	2,327	132	24	-1,200	1.4%	1.3%	1.1%	1.7%	1.4%	0.7%	1.2%	1.2%	1.5%	1.27%	1.29%	1.28%
21	China	15	26	8	-18	577	313	4,441	69	32	193	508	282	4,248	-439	-250	-4,056	1.2%	1.2%	1.4%	0.3%	0.2%	0.1%	2.0%	2.1%	2.7%	0.21%	2.29%	1.25%
10	India	16	21	12	-9	443	347	3,991	100	67	373	343	280	3,618	-243	-213	-3,244	0.9%	1.3%	1.3%	0.4%	0.5%	0.2%	1.4%	2.1%	2.3%	0.38%	1.93%	1.15%
7	South Korea	17	24	13	-11	330	206	6,094	86	39	513	244	167	5,581	-158	-128	-5,068	0.7%	0.8%	1.9%	0.3%	0.3%	0.3%	1.0%	1.3%	3.5%	0.32%	1.92%	1.12%
16	Denmark	18	17	17	0	535	321	3,382	220	129	466	315	192	2,916	-95	-63	-2,450	1.1%	1.2%	1.1%	0.9%	1.0%	0.3%	1.3%	1.5%	1.8%	0.72%	1.52%	1.12%
22	Taiwan	19	14	25	11	658	346	2,280	502	219	1,482	156	128	798	346	91	684	1.3%	1.3%	0.7%	2.0%	1.7%	0.9%	0.6%	1.0%	0.5%	1.54%	0.70%	1.12%
19	Ireland-Rep	20	22	14	-8	417	242	3,862	114	70	195	303	173	3,667	-189	-103	-3,471	0.8%	0.9%	1.2%	0.5%	0.5%	0.1%	1.2%	1.3%	2.3%	0.37%	1.61%	0.99%
13	Finland	21	16	22	6	515	332	2,063	252	153	732	263	180	1,331	-11	-27	-599	1.0%	1.3%	0.7%	1.0%	1.2%	0.5%	1.1%	1.4%	0.8%	0.88%	1.09%	0.98%
20	Italy	22	19	19	0	410	264	3,038	171	86	333	239	178	2,705	-68	-92	-2,372	0.8%	1.0%	1.0%	0.7%	0.6%	0.2%	1.0%	1.3%	1.7%	0.52%	1.34%	0.93%
26	Bermuda	23	36	15	-21	132	57	6,412	15	10	62	117	47	6,350	-102	-36	-6,288	0.3%	0.2%	2.0%	0.1%	0.1%	0.0%	0.5%	0.4%	4.0%	0.06%	1.61%	0.84%
28	Luxembourg	24	20	24	4	180	96	3,487	131	66	538	49	30	2,949	82	36	-2,411	0.4%	0.4%	1.1%	0.5%	0.5%	0.3%	0.2%	0.2%	1.9%	0.46%	0.76%	0.61%
24	Spain	25	33	23	-10	252	162	1,790	20	12	237	232	150	1,554	-212	-138	-1,317	0.5%	0.6%	0.6%	0.1%	0.1%	0.1%	0.9%	1.1%	1.0%	0.11%	1.02%	0.56%
25	Norway	26	18	29	11	278	169	877	176	102	341	102	67	537	74	34	-196	0.6%	0.6%	0.3%	0.7%	0.8%	0.2%	0.4%	0.5%	0.3%	0.56%	0.42%	0.49%
31	Malaysia	27	23	31	8	196	146	466	113	73	157	83	73	308	30	0	-151	0.4%	0.6%	0.1%	0.5%	0.5%	0.1%	0.3%	0.6%	0.2%	0.37%	0.36%	0.36%
23	Brazil	28	32	26	-6	165	96	1,013	41	21	106	124	75	907	-83	-54	-801	0.3%	0.4%	0.3%	0.2%	0.2%	0.1%	0.5%	0.6%	0.6%	0.13%	0.55%	0.34%
27	Austria	29	30	28	-2	174	112	406	42	32	50	132	80	356	-90	-48	-307	0.4%	0.4%	0.1%	0.2%	0.2%	0.0%	0.5%	0.6%	0.2%	0.15%	0.45%	0.30%
29	New Zealand	30	28	30	2	125	104	759	49	38	103	76	66	656	-27	-27	-553	0.3%	0.4%	0.2%	0.2%	0.3%	0.1%	0.3%	0.5%	0.4%	0.18%	0.41%	0.29%
32	Czech Republic	31	25	35	10	136	109	442	62	52	110	74	57	332	-12	-6	-222	0.3%	0.4%	0.1%	0.2%	0.4%	0.1%	0.3%	0.4%	0.2%	0.24%	0.31%	0.28%
30	Poland	32	29	33	4	126	106	432	44	35	134	82	71	298	-38	-35	-164	0.3%	0.4%	0.1%	0.2%	0.3%	0.1%	0.3%	0.5%	0.2%	0.18%	0.35%	0.26%
37	Argentina	33	45	27	-18	92	55	1,113	6	4	7	86	51	1,106	-80	-46	-1,099	0.2%	0.2%	0.4%	0.0%	0.0%	0.0%	0.3%	0.4%	0.7%	0.02%	0.48%	0.25%
34	Indonesia	34	38	32	-6	85	73	532	16	12	15	69	60	517	-53	-48	-502	0.2%	0.3%	0.2%	0.1%	0.1%	0.0%	0.3%	0.5%	0.3%	0.06%	0.35%	0.20%
38	Hungary	35	39	36	-3	83	61	313	15	10	18	68	52	294	-53	-42	-276	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%	0.3%	0.4%	0.2%	0.06%	0.28%	0.17%
40	Philippines	36	37	37	0	74	53	489	21	8	49	53	45	420	-32	-37	-371	0.1%	0.2%	0.2%	0.1%	0.1%	0.0%	0.2%	0.3%	0.3%	0.06%	0.27%	0.17%
36	Thailand	37	58	34	-24	67	64	338	1	1	5	66	64	333	-65	-63	-328	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.3%	0.5%	0.2%	0.00%	0.32%	0.16%
39	Russian Federation	38	31	41	10	74	56	164	43	27	66	31	29	98	12	-1	-32	0.1%	0.2%	0.1%	0.2%	0.2%	0.0%	0.1%	0.2%	0.1%	0.14%	0.13%	0.14%
41	Mexico	39	59	38	-21	48	41	327	1	0	0	47	41	327	-46	-41	-327	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.2%	0.3%	0.2%	0.00%	0.24%	0.12%
42	Romania	40	43	39	-4	44	38	232	7	7	15	37	31	217	-30	-24	-202	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%	0.1%	0.2%	0.1%	0.03%	0.17%	0.10%
44	Mauritius	41	27	88	61	52	36	162	51	35	162	1	1	0	50	34	162	0.1%	0.1%	0.1%	0.2%	0.3%	0.1%	0.0%	0.0%	0.0%	0.19%	0.00%	0.10%
35	Portugal	42	40	40	0	43	27	329	11	8	44	32	19	285	-21	-11	-241	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%	0.1%	0.1%	0.2%	0.04%	0.15%	0.10%
33	South Africa	43	35	44	9	45	26	129	16	12	41	29	14	88	-13	-3	-47	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	0.1%	0.06%	0.09%	0.07%
43	Greece	44	34	53	19	36	28	64	22	18	62	14	11	2	8	7	60	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.09%	0.05%	0.07%
49	Chile	45	52	42	-10	25	19	166	3	1	0	22	18	166	-19	-16	-166	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.01%	0.11%	0.06%
50	Cayman Islands	46	41	48	7	18	9	268	15	6	26	3	3	241	12	3	-215	0.0%	0.0%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.2%	0.04%	0.06%	0.05%
46	Bulgaria	47	0	43	0	18	9	227	0	0	0	18	9	227	-18	-9	-227	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.00%	0.09%	0.05%
47	Nigeria	48	48	47	-1	12	9	185	3	2	6	9	7	179	-6	-5	-173	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.01%	0.07%	0.04%
53	Zambia	49	0	45	0	2	2	325	0	0	0	2	2	325	-2	-2	-325	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.00%	0.08%	0.04%
51	Slovak Republic	50	0	46	0	20	17	30	0	0	0	20	17	30	-20	-17	-30	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.00%	0.08%	0.04%
54	Sri Lanka	51	55	49	-6	15	15	37	1	1	0	14	14	37	-13	-13	-37	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.00%	0.06%	0.03%
48	Iceland	52	47	54	7	19	10	41	5	4	3	14	6	38	-9	-2	-35	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.02%	0.04%	0.03%
56	Estonia	53	51	52	1	13	11	58	3	1	3	10	10	56	-7	-9	-53	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.01%	0.05%	0.03%
58	Kenya	54	0	50	0	15	10	42	0	0	0	15	10	42	-15	-10	-42	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.00%	0.05%	0.03%
60	Croatia	55	0	51	0	12	12	21	0	0	0	12	12	21	-12	-12	-21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.00%	0.05%	0.03%
61	Netherlands Antilles	56	42	63	21	13	12	12	8	8	8	5	4	5	3	4	3	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.03%	0.02%	0.02%
55	Lithuania	57	0	55	0	7	5	51	0	0	0	7	5	51	-7	-5	-51	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.03%	0.02%
62	Cyprus	58	0	56	0	5	5	61	0	0	0	5	5	61	-5	-5	-61	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.03%	0.02%
64	Ghana	59	0	57	0	8	8	4	0	0	0	8	8	4	-8	-8	-4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.03%	0.02%
52	Ukraine	60	46	72	26	7	7	10	5	5	1	2	2	10	3	3	-8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.02%	0.01%	0.01%
65	Tanzania	61	0	58	0	2	2	94	0	0	0	2	2	94	-2	-2	-94	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.00%	0.02%	0.01%
69	Moldova	62	0	59	0	6	6	1	0	0	0	6	6	1	-6	-6	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
70	Madagascar	63	44	0	0	9	3	9	9	3	9	0	0	0	9	3	9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.02%	0.00%	0.01%
59	Pakistan	64	0	60	0	3	2	52	0	0	0	3	2	52	-3	-2	-52	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
57	Turkey	65	0	61	0	4	4	26	0	0	0	4	4	26	-4	-4	-26	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
63	United Arab Emirates	66	49	73	24	4	4	19	2	2	13	2	2	7	0	0	6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.01%	0.01%
67	Colombia	67	0	62	0	3	2	46	0	0	0	3	2	46	-3	-2	-46	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
72	Monaco	68	0	64	0	5	4	0	0	0	0	5	4	0	-5	-4	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
71	British Virgin	69	0	65	0	3	2	25	0	0	0	3	2	25	-3	-2	-25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
74	Jordan	70	0	66	0	3	3	11	0	0	0	3	3	11	-3	-3	-11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
77	Latvia	71	0	67	0	3	3	0	0	0	0	3	3	0	-3	-3	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
78	Fr Polynesia	72	0	68	0	3	3	0	0	0	0	3	3	0	-3	-3	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
76	Egypt	73	0	69	0	3	2	10	0	0	0	3	2	10	-3	-2	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
80	Slovenia	74	53	88	35	3	2	1	2	1	1	1	1	0	1	0	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.00%	0.01%
79	El Salvador	75	0	70	0	2	2	10	0	0	0	2	2	10	-2	-2	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
75	Ecuador	76	0	71	0	1	1	28	0	0	0	1	1	28	-1	-1	-28	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
82	Kazakhstan	77	0	74	0	2	2	5	0	0	0	2	2	5	-2	-2	-5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
45	Vietnam	78	0	75	0	2	2	4	0	0	0	2	2	4	-2	-2	-4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
83	Senegal	79	50	0	0	2	2	2	2	2	2	0	0	0	2	2	2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.00%	0.00%
84	Azerbaijan	80	0	76	0	2	2	0	0	0	0	2	2	0	-2	-2	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
85	Costa Rica	81	55	88	33	2	2	0	1	1	0	1	1	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
86	Fiji	81	0	77	0	2	2	0	0	0	0	2	2	0	-2	-2	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
81	Bangladesh	83	0	78	0	1	1	18	0	0	0	1	1	18	-1	-1	-18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
88	Saudi Arabia	84	54	0	0	2	1	1	2	1	1	0	0	0	2	1	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.00%	0.00%
87	Peru	85	0	79	0	1	1	10	0	0	0	1	1	10	-1	-1	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
66	Morocco	86	0	80	0	1	1	10	0	0	0	1	1	10	-1	-1	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
89	Algeria	87	0	81	0	1	1	4	0	0	0	1	1	4	-1	-1	-4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
90	Bolivia	88	0	82	0	1	1	3	0	0	0	1	1	3	-1	-1	-3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
91	Macedonia	89	0	83	0	1	1	2	0	0	0	1	1	2	-1	-1	-2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
92	Mozambique	90	0	84	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
93	Sierra Leone	91	0	85	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
94	Venezuela	92	0	86	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
95	Bosnia	93	0	87	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
96	Dominica	94	0	88	0	1	1	0	0	0	0	1	1	0	-1	-1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
97	Kuwait	94	55	0	0	1	1	0	1	1	0	0	0	0	1	1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
98	Nicaragua	94	0	88	0	1	1	0	0	0	0	1	1	0	-1	-1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
99	Uganda	94	0	88	0	1	1	0	0	0	0	1	1	0	-1	-1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
	Grand Total					49,614	26,462	316,559	24,807	13,231	158,280	24,807	13,231	158,280													100%	100%	100%

Unlike the activity, expressed as a percentage in the previous analysis (defined as a dependent variable), the percentage of cross-border activity here refers only to the total of cross-border investments (columns 16–30) for precise analysis of cross-border deals. The differences in source and host activity (columns 16–18) are identical to the numbers from the previous table because they present the net

ratio of source / host activity, which is essentially net cross-border activity. In total, **97** countries are listed, with **59** source and **93** host countries. The ranking identifies large differences in cross-border investment activity compared to the overall deal activity from Table 8 (column 1 displays the rank of overall deal activity from Table 8). With regard to the explicative analysis and the derived top 43 countries, the shifts are within the top 44 countries. Only Mauritius, with a high cross-border ranking (but unavailable explanatory data and less than 0.02% overall activity) is excluded. The comparison simultaneously confirms the selection of top country overall and top country for cross-border activity in the explicative analysis. It indicates that the largest PE countries are also the most active cross-border deal countries.

In the country results, the arrangement in the cross-border table is more diverse. The major countries are the United States, United Kingdom, Germany, France, Canada, and the Netherlands. The US, with 35% of all PE activity, is still the most active country, but only twice the size of the UK, which is second, with 17%. In general, more countries account for a higher portion of cross-border deals. The top 19 countries have more than 1% of global activity each compared to the overall activity from Table 8, which shows only six countries accounting for more than 1% each. Within the top countries, Germany and France have more than 5%. Canada, the Netherlands, Israel, Japan, Switzerland, and Sweden follow with more than 2% of activity each. Comparing the ranking of source and host activity, the US and UK still rank one and two globally, but Germany and France's global rankings for source and host have changed. Germany is third as source country and fourth as host country relative to the rest of the world. France is fifth as source and third as host country. The differences in the global ranking of source and host, in combination with the net balance of countries, indicate concentration shifts of PE activity between countries. Germany is a net importer of PE activity (columns 16–18 and 28–29) and the third most important source country, but only the fourth most important host country. This constellation of ranking is possible because the US and UK share 62% of source activity (column 28) but account as top countries for only 41.8% of host activity (column 29). The US and UK rank as top countries in all variables. Germany, France, Canada and the other countries differ clearly in their ranking by activity variables. The US accounts for 36.4% of total participation, with 32.6% as source and 40.2% as host country. While deal participation was the lowest segment for the US in Table

8, here it is the largest segment, with participation as source being lower than participation as host.

Deal flow for the US has a similar distribution, with an average of 35.8% but with 47.6% in source and 23.9% in host. This indicates that the US has relatively fewer participations with high deal flow investing abroad, and many participations with less deal flow investing inbound. The outflow of deal flow is double the amount of inflow, while host participation is one third higher than source participation. The UK has more evenly distributed variables, with 22% to 25% for source and 10% to 11% for host. Source activity is twice as large as host activity. The UK has a diverse investment profile compared to the US, indicated by the concentration of dependent variables. Germany and France, with nearly the same overall activity of 5.4% and 5.3%, show a completely diverse profile in the subsegments. Both countries have more host than source activity, but with a different ratio: Germany has 4.0% to 6.9% and France 3.1% to 7.6% (columns 28–29). Further breakdown indicates a difference in concentration of the source / host deal flow ratio between Germany and France, with 2.4% to 7.1% and 1.8% to 8.9% respectively (columns 24 and 27) — France has more overall deal flow while Germany has more participations in deals. The table illustrates the ratio of dependent variables for all countries as a percentage of total cross-border activity as well as in absolute numbers. The shift in ranking is illustrated through the red highlighted absolute numbers.

The analysis of country cross-sections identifies diverse country investment behavior for domestic and cross-border, source and host, and the dependent variables, expressing the need to understand exactly what affects different cross-border behavior. The arrangement of overall, source, and host activity makes it possible to comprehensively analyze the propensity of countries for PE activity, but it is especially helpful to reveal country activity within the dual role of source and host for cross-border investment.

This analyses display the time series and the cross-section as an initial picture of growth and volume of activity over time and separately across countries, verifying cross-border investment tendencies. The following analyses are rooted in this foundation and analyze the data multidimensionally.

3. Descriptive analysis of private equity activity

The descriptive analyses investigate PE activity, with a focus on the three-dimensional gravity model. The essential areas are investment activity evolution by country, the affinity of countries toward each other, and country pair dynamics, including investment rounds and partnering. The analysis follows the path developed in Figure 16.

The panel data analysis evaluates the source countries by deal flow, participation, and activity, with each diversified into overall and cross-border deals to identify time-specific patterns within and between countries.

The static gravity model analysis verifies the affinity of country pairs for all dependent variables accumulated over all years under consideration. Initial comprehensive analysis includes deal flow and activity as a percentage of domestic and cross-border deals. The built-on analyses focus in depth on cross-border deals only.

The dynamic gravity model with time component is the expansion of the previous analyses. The model is broken down into country pair combinations over years, focusing especially on the dynamics of country affinity during the significant time periods of boom, peak, and downturn.

The PE-specific instances of investment round and number of investors participating in a deal — defined as deal type (Chapter B.2.3.1.) — is analyzed with a time series to identify the different behaviors for domestic and cross-border investments over time.

Finally, an analysis of deal flow, scaled by GDP of source country, accounts for country size and identifies financial centers over time and by country pairs.

3.1. Investments of a country over time — panel data

The panel data analysis investigates each of the **70** source countries for the time series from 1980 through 2005. The graphs show the variables by source country over time in the top section, and for overall deals (domestic and cross-border) and cross-border deals at the bottom. The *y*-axis is capped to enhance the amplitude of country activity. The patterns for the US and UK are displayed in detail on the right of the graphs. The top twelve cross-border countries are highlighted.

Deal flow: The first analysis is on deal flow. The following figure displays patterns of source country activity by visualizing the intercepts and the slope for each country in a time series. Similar slopes identify similarity in country activity, while the intercept displays the amplitude as a scale factor.[169]

Figure 18: Panel of source countries — domestic and cross-border deal flow
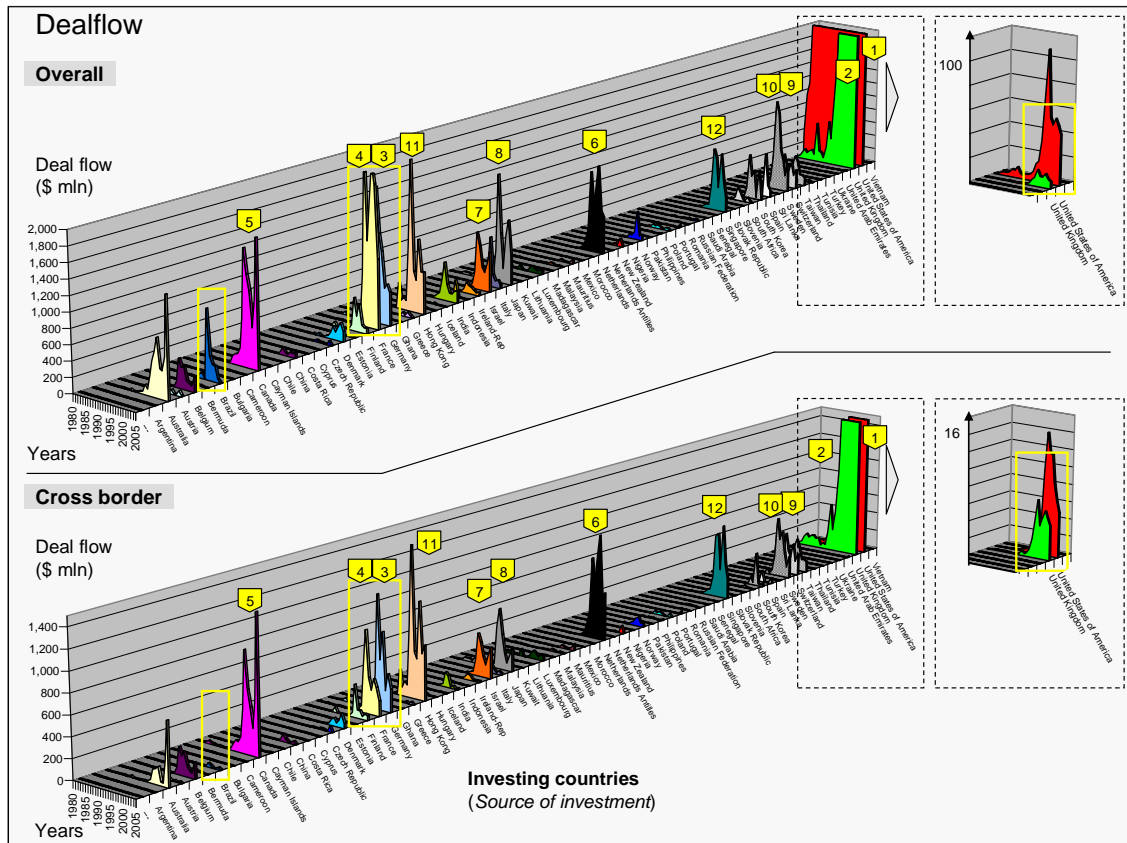
The time series shows highly volatile patterns both within and between the country time series. Absolute deal flow and growth rate for each country differ over time. Referring to the terms of panel data regression, the countries vary by slope and intercept at a certain time point. Although the country patterns are highly volatile with different curves, they show a common evolution, with a significant growth rate in the late '90s and a distinctive peak in the year 2000. Country development varies significantly once the global downturn set in.

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[169]   See Chapter B.2.2. — panel data and fixed-effect models.

In the overall deal flow, for example, are countries like Canada (5) or Singapore (12) with two distinctive peaks; other countries, like the United States (1) or Sweden (10), have only one. Some countries, like Canada (5) or Australia, have an even larger second peak in 2005.

Comparing the individual country series of overall and cross-border activity to each other, it is significant that countries differ in the relative degree of amplitude between overall and cross-border activity at a certain point in time. Brazil and France (4) (yellow boxes), for example, indicate greater domestic activity relative to cross-border activity. Further, countries differ among each other in their cyclical or anticyclical cross-border behavior relative to their domestic deals, such as Canada (5) compared to France (4).

For some countries the slopes stay the same, such as Canada (5), Hong Kong (11), Israel (7), and Singapore (12), while countries like France (4), Japan (8), and Brazil have different slopes. The difference in absolute height and slope between the US (1) and the UK (2) is especially obvious. The US has significant overall PE activity beginning in the early 1980s; the UK has significant activity in the '90s, with a larger proportion of cross-border deals relative to the US.

When comparing the panel data analysis to the cross-section analyses (Tables 8 and 9) and to the consolidated deal flow, the country time series indicate a variety of dynamics across countries and across overall and cross-border deals. This pattern, with its growth rates shown in the time series, indicates an intersection of both a global and a country-specific trend.

Participation: The next analysis focuses on the panel data for source countries over time for participation, excluding the effect of different deal size. It is significant that this series is even more volatile than the previous deal flow results, which is indicated by dependent variable participation, again, with its sensitivity not impacted by deal size. The patterns differ significantly within the countries compared to the deal flow graph.

Figure 19: Panel of source countries — domestic and cross-border participation
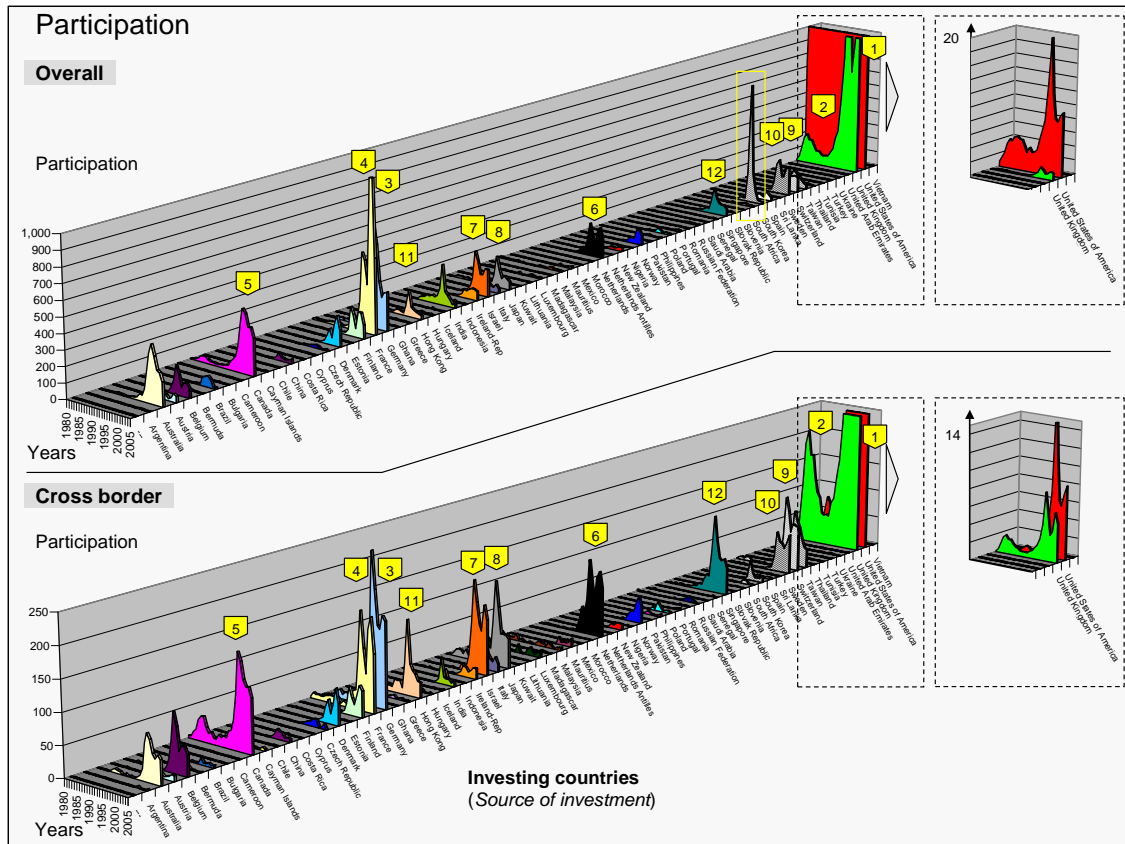
There are countries that have a low amplitude in the deal flow illustration but a significant curve in participation, and vice versa. The most significant countries are Canada (5), with a shift from a two-peak curve to a one-peak curve compared to deal flow. France (4) has a large second amplitude in overall participation, while the two peaks in the cross-border section are at the same height and even inverse to the cross-border deal flow series. One extreme is South Korea (yellow frame), which has a rapid growth rate in 1999 and a high peak in 2000 in overall participation.

The US and the UK, as the most active countries, have different patterns. The US has a large portion of the overall participation, with significant participation in the mid-1980s and a second large peak in 2000, but without a significant early peak in the cross-border deal. The UK has less participation compared to the US, but significant presence in cross-border deal activity. The cross-border pattern of the UK shows much activity in 1983 and 1984, and has a similar pattern as the US from the beginning of the boom phase on, but with less amplitude. The

analysis of deal flow and participation as time series indicates different dynamics between the countries and within each country for domestic and cross-border, but also across their dependent variables, indicating differences in deal size or investment partnering.

Activity: The following graph shows the comprehensive variable activity, expressed as a percentage, for cross-border investments over time. It is the main result of the panel data analysis of source countries, summarizing differing behavior by dependent variable participation, deal participation, and deal flow for each country. The graph shows the previous results with a smoother curve for the series (for example, Canada with two peaks of activity resulting from the average of deal flow, participation and deal participation).

Figure 20: Activity by country over time
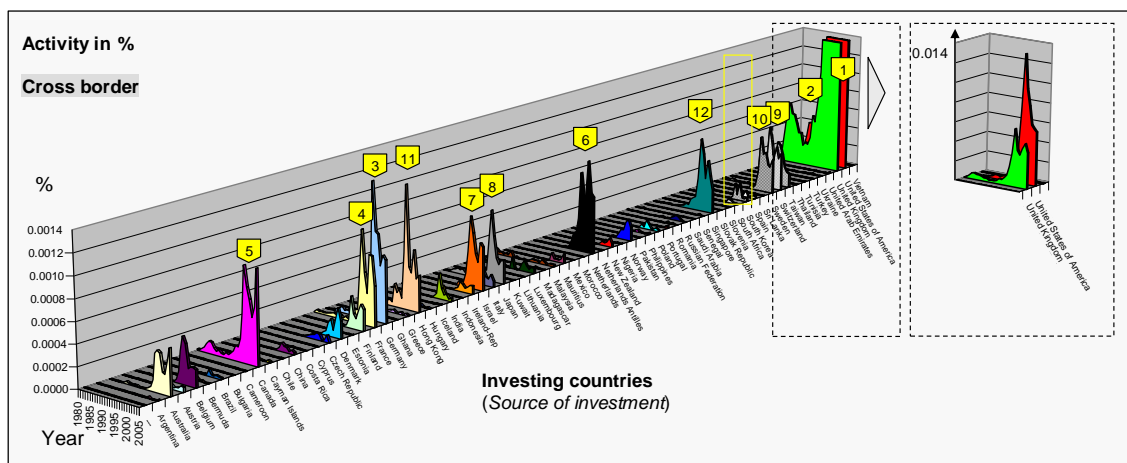
The panel data analysis for participation, deal participation, and deal flow identified differing source country behavior as well as a similarity of patterns over time for both domestic and cross-border activity. The next step focuses on the propensity of cross-border investments toward potential host country trading partners.

3.2.   Investments from source to host country — gravity model

The gravity model analysis identifies the affinity of countries to each other for cross-border investment as source and host. The following analyses investigate a matrix of **6,510** (Chapter B.3.1.3.) basis data points. It also displays the different country activity measurements over all years from 1980 through 2005.

The graphs and tables highlight the pattern of core concentration of activity by country pair, which is then used to generate further data and refine the hypothesis that countries tend to have core trading partners in the private equity business.

3.2.1. Overall investment activity

Overall country pair affinity for PE investment is analyzed by deal flow, participation, and activity as a percentage, following the sequence of the previous chapter. In the first analysis, the domestic deals with identical source and host country are included for comparison of specific country-pair activity to domestic activity. Country-pair activity is presented graphically by source and host country, and further represented by tabular analysis ranking the country pairs for each dependent variable to determine country affinity accumulated over time.

Deal flow: The graph below shows deal flow from 1980 through 2005 for host countries, with source countries on the right; domestic deal flow of the UK and the US is capped by US$7 billion. Source countries are displayed in alphabetical order. A is in front, placing the UK (green) and the US (red) in the back of the chart. Host countries are displayed from left to right, with domestic deals running diagonally from left to right. The top 20 source / host deal-flow combinations are numbered and highlighted, and listed in detail in Table 10 below.

In general, the graph presents an irregular pattern of country-pair activity, although three main arrays stand out.[170] The first array is domestic activity on the diagonal, the second is US (red) and UK (green) source activity in the back, and third, US host activity on the right. Besides the main arrays, many country pairs with little or no activity appear, but in between single spots with significant country activity arise, indicating a large propensity of interest toward a particular country.

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[170] Compare matrix in Chapter B.3.1.3.

Figure 21: Deal flow overview — source country to host country with domestic deals
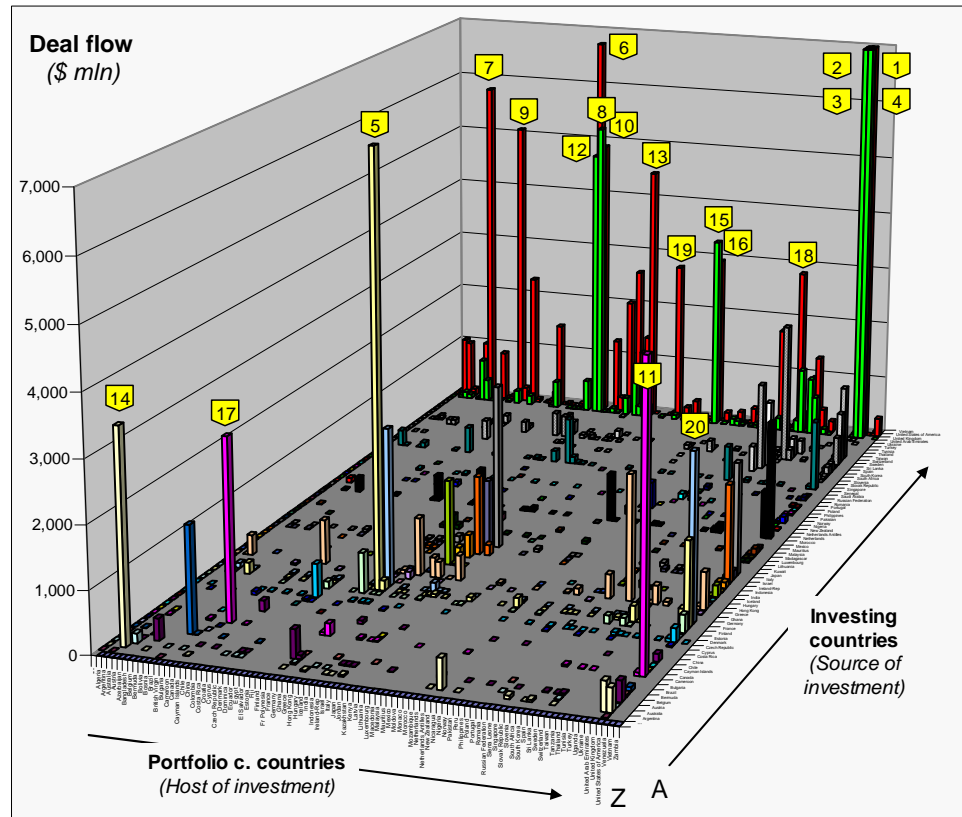
Even within the main arrays, activity is irregularly distributed. Domestic deals vary largely, with the greatest domestic activity in the US (1), the UK (2), France (5), Australia (14), and Canada (17). With regard to source activity of the US (red) and the UK (green), the US invests heavily in a variety of host countries and accounts for nine of the top 20 country-pair activities, but the irregular pattern indicates a propensity toward particular countries. The UK has a strong affinity toward four main host countries, with a relatively high amplitude compared to its other host countries — the US (3), Germany (8), France (12), and the Netherlands (15). The pattern of host country activity of the US indicates that it is a major host for many countries, and especially for some, like the UK (3), Canada (11), and Germany (20).

The following table presents an excerpt of the top 20 country pairs ranked by deal-flow activity, detailing the rules behind country affinity.

Table 10: Top 20 country pairs — source country to host country deal flow

Rank	D	CB	Source	Host	Part.	DP	DF	% Part.	% DP	% DF	Activity
	1		United States of America	United States of America	144,102	63,577	489,490	75.72%	68.96%	67.99%	70.89%
	2		United Kingdom	United Kingdom	5,168	3,847	34,869	2.72%	4.17%	4.84%	3.91%
	3	x	United Kingdom	United States of America	2,939	1,205	16,424	1.54%	1.31%	2.28%	1.71%
	4	x	United States of America	United Kingdom	1,677	1,026	14,857	0.88%	1.11%	2.06%	1.35%
	5		France	France	3,466	2,105	8,263	1.82%	2.28%	1.15%	1.75%
	6	x	United States of America	France	687	355	6,758	0.36%	0.39%	0.94%	0.56%
	7	x	United States of America	Bermuda	105	44	5,798	0.06%	0.05%	0.81%	0.30%
	8	x	United Kingdom	Germany	552	413	5,256	0.29%	0.45%	0.73%	0.49%
	9	x	United States of America	Canada	949	489	5,102	0.50%	0.53%	0.71%	0.58%
	10	x	United States of America	Germany	587	330	4,901	0.31%	0.36%	0.68%	0.45%
	11	x	Canada	United States of America	1,122	355	4,792	0.59%	0.39%	0.67%	0.55%
	12	x	United Kingdom	France	580	407	4,756	0.30%	0.44%	0.66%	0.47%
	13	x	United States of America	Japan	289	227	4,468	0.15%	0.25%	0.62%	0.34%
	14		Australia	Australia	1,546	1,295	3,409	0.81%	1.40%	0.47%	0.90%
	15	x	United Kingdom	Netherlands	132	92	3,361	0.07%	0.10%	0.47%	0.21%
	16	x	United States of America	Netherlands	323	164	2,962	0.17%	0.18%	0.41%	0.25%
	17		Canada	Canada	1,433	720	2,924	0.75%	0.78%	0.41%	0.65%
	18	x	United States of America	South Korea	152	105	2,858	0.08%	0.11%	0.40%	0.20%
	19	x	United States of America	Luxembourg	28	18	2,782	0.01%	0.02%	0.39%	0.14%
	20	x	Germany	United States of America	910	341	2,712	0.48%	0.37%	0.38%	0.41%
Total					166,747	77,115	626,742	87.61%	83.64%	87.05%	86.10%

Legend: D= Rank dealflow; CB= Cross-border; Part.= Participation; DP= Deal-participation; DF= Dealflow

The top 20 country pairs listed represent $626.7 billion, or 87%, of global deal flow ($720 billion). Listed are five domestic deals of the US, UK, France, Australia, and Canada, and 15 cross-border deals, with diverse source and host countries.

The US and the UK dominate cross-border deal-flow activity as source countries, with the US listed nine times and the UK listed four times. Canada comes in 11th and Germany 20th. The top host country cross-border listing is less concentrated, with certain countries appearing several times: the US is listed three times, France, Canada, Germany, and the Netherlands two times, and the UK, Bermuda, Japan, Luxembourg, and South Korea each listed once. Comparing the country pairs, including domestic and cross-border deals, by amount of deal flow, domestic US deals account for $490 billion or 68% of global PE investment deal flow, followed by the domestic deals of the UK, with 5% of global deal flow, worth $35 billion. The next two significant pairs are the cross-border deals between the US and the UK. The UK / US is the largest cross-border country-pair combination, with a deal flow of $16.4 billion. This is 10.4% larger than the transfer from the US to the UK ($14.9 billion). French domestic deals are listed next, with 1.2% of global deal flow. France to France is the fifth largest country pair and is the third largest domestic market, just ahead of Australia (14) and Canada (17). The following country pairs account for less than 1% of the global deal flow, with the US investing in France, Bermuda, Canada, Germany, Japan, Netherlands, South Korea, and Luxembourg, as well as other countries scattered

over the globe, while the UK focuses on its neighboring European countries — Germany, France, and the Netherlands, and, of course, the US.

The country pair listing shows the dominance of the US in general, and with the UK for cross-border deal flow in particular. Both countries are involved in all of the top twenty country-pair activities, except the domestic deals of France, Australia, and Canada. The source countries' sequence of investing in host countries indicates the source countries' preference for particular target countries.

The sequence of preference of host countries for the US (UK, France, Bermuda, Canada, and Germany) differs significantly from that of the UK (US, Germany, France, and the Netherlands). Differences occur in the dual role of a country as source or host. France, for example, with its large domestic market, is not listed under the top countries as a cross-border source country, whereas it is an attractive host country. Australia, the fourth largest domestic market, is listed neither as source nor host, indicating an isolated position in PE investment. Canada, the fifth largest domestic market, has more cross-border deals with the US than deals within its own domestic market.

Participation: The next step in the analysis ranks country pairs by participation to reveal country activity without considering deal size. The following table presents the results in the same layout as the previous table (Table 10), highlighting that prior table's deal-flow pairs for comparison.

Table 11: Top 20 country pairs — source country to host country participation

P	D	CB	Source	Host	Part.	DP	DF	% Part.	% DP	% DF	Activity
1	1		United States of America	United States of America	144,102	63,577	489,490	75.72%	68.96%	67.99%	70.89%
2	2		United Kingdom	United Kingdom	5,168	3,847	34,869	2.72%	4.17%	4.84%	3.91%
3	5		France	France	3,466	2,105	8,263	1.82%	2.28%	1.15%	1.75%
4	3	x	United Kingdom	United States of America	2,939	1,205	16,424	1.54%	1.31%	2.28%	1.71%
5	4	x	United States of America	United Kingdom	1,677	1,026	14,857	0.88%	1.11%	2.06%	1.35%
6	14		Australia	Australia	1,546	1,295	3,409	0.81%	1.40%	0.47%	0.90%
7	23		Germany	Germany	1,470	980	2,548	0.77%	1.06%	0.35%	0.73%
8	17		Canada	Canada	1,433	720	2,924	0.75%	0.78%	0.41%	0.65%
9	33		South Korea	South Korea	1,353	1,071	1,488	0.71%	1.16%	0.21%	0.69%
10	11	x	Canada	United States of America	1,122	355	4,792	0.59%	0.39%	0.67%	0.55%
11	9	x	United States of America	Canada	949	489	5,102	0.50%	0.53%	0.71%	0.58%
12	20	x	Germany	United States of America	910	341	2,712	0.48%	0.37%	0.38%	0.41%
13	37		India	India	854	791	1,383	0.45%	0.86%	0.19%	0.50%
14	24		Sweden	Sweden	842	606	2,379	0.44%	0.66%	0.33%	0.48%
15	32	x	Israel	United States of America	709	280	1,612	0.37%	0.30%	0.22%	0.30%
16	6	x	United States of America	France	687	355	6,758	0.36%	0.39%	0.94%	0.56%
17	63		Finland	Finland	639	544	656	0.34%	0.59%	0.09%	0.34%
18	10	x	United States of America	Germany	587	330	4,901	0.31%	0.36%	0.68%	0.45%
18	29	x	Japan	United States of America	587	179	1,845	0.31%	0.19%	0.26%	0.25%
20	40		Israel	Israel	586	282	1,287	0.31%	0.31%	0.18%	0.26%
Total					171,626	80,379	607,700	90.18%	87.18%	84.41%	87.26%

Legend: P= Rank Participation; D= Rank Dealflow; CB= Cross-border; Part.= Participation; DP= Deal-participation; DF= Dealflow

Table 11, which lists the top 20 country pairs by participation (including domestic deals) encompasses **90%** of global deal participation, **171,626** observations, and **84%** of global deal flow. Compared to the previous deal flow table, Table 11 contains more domestic deals with a ratio of domestic to cross-border of 11 to 9. The 11 countries (domestic deal) in order of rank are the US, UK, France, Australia, Germany, Canada, South Korea, India, Sweden, Finland, and Israel. In this view, eight country pairs are newly listed: Germany, South Korea, India, Sweden, Finland, and Israel as domestic country pairs, and Israel / United States and Japan / United States as cross-border country pairs. Comparing the ranks of country pairs for deal flow and participation, large differences occur from rank 6 (Australia domestic) on. For example, Finland, with its domestic deals, ranks 17 in participation and 63 in deal flow, whereas the cross-border country pairs with the US as source country rank lower compared to deal-flow rank. Overall, the US is the dominant source and host country by participation, but with a shift in the ratio of source to host (4 to 5) compared to the deal-flow analysis (9 to 3), excluding domestic deals. The UK is listed only twice, as country with domestic deal activity and with the US in cross-border participation, indicating that the UK's participation is very confined to its domestic market and to the US.

The comparison of results between deal flow and participation indicate country pair-specific deal structures, and confirm the findings of the cross-section analysis (Chapter C.2.2.) in the net ratio of import and export for the dependent variables and a particular country. Comparison of the results between deal flow and the participation analysis reveals the different deal characteristics within country pairs — either few investors and / or high dollar volume, or many investors and / or small deal size.

Activity: The analysis of activity, expressed as percentages, consolidates the results of dependent variable participation, deal participation, and deal flow for country pairs.

Table 12: Top 20 country pairs — source country to host country activity in percentage

A	P	D	CB	Source	Host	Part.	DP	DF	% Part.	% DP	% DF	Activity
1	1	1		United States of America	United States of America	144,102	63,577	489,490	75.72%	68.96%	67.99%	70.8877%
2	2	2		United Kingdom	United Kingdom	5,168	3,847	34,869	2.72%	4.17%	4.84%	3.9103%
3	5	3		France	France	3,466	2,105	8,263	1.82%	2.28%	1.15%	1.7507%
4	3	4	x	United Kingdom	United States of America	2,939	1,205	16,424	1.54%	1.31%	2.28%	1.7110%
5	4	5	x	United States of America	United Kingdom	1,677	1,026	14,857	0.88%	1.11%	2.06%	1.3525%
6	14	6		Australia	Australia	1,546	1,295	3,409	0.81%	1.40%	0.47%	0.8967%
7	23	7		Germany	Germany	1,470	980	2,548	0.77%	1.06%	0.35%	0.7296%
8	33	9		South Korea	South Korea	1,353	1,071	1,488	0.71%	1.16%	0.21%	0.6932%
9	17	8		Canada	Canada	1,433	720	2,924	0.75%	0.78%	0.41%	0.6466%
10	9	11	x	United States of America	Canada	949	489	5,102	0.50%	0.53%	0.71%	0.5792%
11	6	16	x	United States of America	France	687	355	6,758	0.36%	0.39%	0.94%	0.5616%
12	11	10	x	Canada	United States of America	1,122	355	4,792	0.59%	0.39%	0.67%	0.5469%
13	37	13		India	India	854	791	1,383	0.45%	0.86%	0.19%	0.4995%
14	8	23	x	United Kingdom	Germany	552	413	5,256	0.29%	0.45%	0.73%	0.4895%
15	24	14		Sweden	Sweden	842	606	2,379	0.44%	0.66%	0.33%	0.4768%
16	12	21	x	United Kingdom	France	580	407	4,756	0.30%	0.44%	0.66%	0.4689%
17	10	18	x	United States of America	Germany	587	330	4,901	0.31%	0.36%	0.68%	0.4491%
18	20	12	x	Germany	United States of America	910	341	2,712	0.48%	0.37%	0.38%	0.4083%
19	13	35	x	United States of America	Japan	289	227	4,468	0.15%	0.25%	0.62%	0.3394%
20	63	17		Finland	Finland	639	544	656	0.34%	0.59%	0.09%	0.3390%
Total						171,165	80,684	617,436	89.94%	87.51%	85.76%	87.74%

Legend: A= Rank Activity; P= Rank Participation; D= Rank Dealflow; CB= Cross-border; Part.= Participation; DP= Deal-participation; DF= Dealflow

The table lists the top 20 country pairs by activity, covering 87% of global activity. In total, 10 domestic country pairs exist — US, UK, France, Australia, Germany, South Korea, Canada, India, Sweden, and Finland. Among the 10 cross-border pairs are four different source countries: the US appears five times, the UK three times, and Canada and Germany once each. The six different host countries are: US (three times), France and Germany (twice each), and Canada, Japan, and UK (once each). The overall comparison of absolute and relative numbers of the activity variables by country pair verifies a change of affinity between countries, depending on which variable is used. The three analyses of deal flow, participation, and activity as a percentage for country pairs, with primary focus on the top 20 country pairs (including domestic deals), lead to several conclusions. Overall PE activity is highly concentrated, with US domestic deal activity accounting for more than 71% of global PE activity. Further, the activity is concentrated in three main arrays, with differing density: first, the domestic deal activity of countries; second, US and UK source country activity; and third, the host country activity of the US. Although the US is the largest cross-border investor, the UK has the greatest investment activity in the US. The irregular host country sequences by particular source country verify that countries have a propensity toward particular trading partners. If they did not have such preferences, the host country sequence, including domestic deals, would be identical for all source countries, which is not the case. The irregular patterns support the hypothesis that country affinity or even aversion is triggered by country pair-specific determinants.

3.2.2. Cross-border investment activity

To investigate country affinity in depth by identifying underlying rules and norms of country relations, the analysis focuses on cross-border deals only. Paying attention to country pairs with less activity — while accounting for country size and the accumulation of deals over time, indicating maturity of the PE market — helps to refine the analytic process. The matrix comprises **59** source and **93** host countries, covering deals from 1980 through 2005. Country pair activity is presented graphically for deal flow and activity as a percentage, similar to the previous graph, but with a reversed source country axis and excluding the diagonal domestic array. The top 10 cross-border deals, and additionally the top 20 cross-border deals without the US and the UK, are listed by rank of activity as a percentage. The top 10 cross-border deal country pairs are taken from the previous listed results from the top 20 country pairs by activity as a percentage (Table 12).

Deal flow: The graph shows the investment flow for host and source country pairs from 1980 through 2005, with deal flow capped at US $5 billion to emphasize patterns in the matrix and to identify underlying rules of affinity.

Figure 22: Cross-border deals from 1980 through 2005 by deal flow

Top 10 Cross-border deals		
Nr.	Source	Host
1	United Kingdom	United States of America
2	United States of America	United Kingdom
3	United States of America	France
4	United States of America	Bermuda
5	United Kingdom	Germany
6	United States of America	Canada
7	United States of America	Germany
8	Canada	United States of America
9	United Kingdom	France
10	United States of America	Japan

Top 20 Cross-border deals without US and UK					
Nr.	Source	Host	Nr.	Source	Host
1	Hong Kong	South Korea	11	Hong Kong	Singapore
2	Singapore	India	12	Sweden	France
3	Hong Kong	China	13	South Korea	China
4	Netherlands	France	14	Hong Kong	Australia
5	Australia	New Zealand	15	Switzerland	France
6	Belgium	France	16	Hong Kong	India
7	Singapore	China	17	Hong Kong	Taiwan
8	Netherlands	Denmark	18	Germany	France
9	Sweden	Finland	19	Singapore	Australia
10	Hong Kong	Japan	20	Hong Kong	Indonesia

The analysis accounts for the cross-border activity of the two main arrays: US / UK source activity and US host activity, but it emphasizes the large array of single spot country pair combinations with significant country activity apart from a US presence. The top 10 cross-border deals by deal flow of country pairs are dominated by three source countries (US (six times), the UK (three times), and Canada (once)), and seven host countries (US, France, Germany, each listed twice, and UK, Canada, Bermuda, and Japan, each listed once), verifying the

irregular pattern of deal activity of the top country pairs. The top 20 country pair listing, excluding the US and UK, confirms the concentration of deals in nine source countries, with Hong Kong, Singapore, the Netherlands, and Sweden having multiple host countries, and Australia, Belgium, Germany, South Korea, and Switzerland having one host country each in the top 20 list. The host deal flow is less concentrated, having a total of 12 countries, with France, China, Australia, and India being multiple hosts, and Denmark, Finland, Indonesia, Japan, New Zealand, Singapore, South Korea, and Taiwan listed once each as host.

Focusing on the pattern of country pair activity without the US and the UK, three main categories are prominent in the array: first, empty spots that indicate no country pair activity; second, single columns within a source and host country series, like the country pairs Australia / New Zealand (5) and Belgium / France (6), that indicate a strong affinity of one particular country pair; and third, a series of columns, like the source series of Hong Kong with its eight host countries (1, 3, 10, 11, 14, 16, 17, 20), or Singapore with three host countries (2, 7, 19), indicating countries with affinity toward several particular host countries. To explore patterns of affinity further, the countries are arranged by trading partner. Hong Kong as source country, for example, is listed with its nearby and bordering countries — South Korea, China, Japan, Singapore, Australia, India, Taiwan, and Indonesia. Singapore is listed with India, China, and Australia. The Netherlands is listed with the hosts France and Sweden, and source country Sweden with hosts Finland and France. Country pairs seem to be related by geographical and economic distance, verified further through the single host pairs: Australia / New Zealand, Belgium / France, Germany / France, South Korea / China, and Switzerland / France. The findings support the assumptions of the gravity model — that the closer the proximity and the larger the economy, the greater the chances for cross-border activity.

Activity: This analysis evaluates country pairs by comprehensive variable activity as a percentage. This is used as the core ranking parameter to further explore country affinity patterns, with special attention to participation and deal participation. The graphic analysis is refined by tabular analysis of absolute numbers. The following graph shows the investment flow for host and source country pairs of the previous graph (Figure 22) with variable activity capped at

0.005% of global deal activity, including both the top 10 and top 20 cross-border pairs, but excluding the US and the UK.

Figure 23: Cross-border deals from 1980 through 2005 by activity

Top 10 Cross-border deals		
Nr.	Source	Host
1	United Kingdom	United States of America
2	United States of America	United Kingdom
3	United States of America	Canada
4	United States of America	France
5	Canada	United States of America
6	United Kingdom	Germany
7	United Kingdom	France
8	United States of America	Germany
9	Germany	United States of America
10	United States of America	Japan

Top 20 Cross-border deals without US and UK					
Nr.	Source	Host	Nr.	Source	Host
1	Hong Kong	South Korea	11	France	Germany
2	Hong Kong	China	12	Switzerland	France
3	Netherlands	France	13	Hong Kong	Singapore
4	Singapore	India	14	France	Switzerland
5	Australia	New Zealand	15	Netherlands	Germany
6	Sweden	Finland	16	Sweden	Denmark
7	Belgium	France	17	Hong Kong	Australia
8	Switzerland	Germany	18	Netherlands	Belgium
9	Finland	Sweden	19	Hong Kong	Taiwan
10	Singapore	China	20	Hong Kong	India

The graph illustrates an overall pattern similar to the previous deal flow analysis, but with minor shifts in the major arrays as shown in the two country pair tables.

The top 10 cross-border deals by activity of country pairs are dominated by 4 source countries (the US (five times), the UK (three times) and Canada and

Germany (once each)) and six host countries (the US (three times), France, Germany (twice each) and the UK, Canada and Japan (once each)), verifying a higher concentration of host countries compared to deal flow. The top 20 country pair listing, excluding the US and the UK, shows nine source countries, with Hong Kong, the Netherlands, France, Singapore, Sweden, and Switzerland having multiple host countries, and Australia, Belgium, and Finland each having one host country. The deal flow cross-border analysis (Figure 22) included source countries Germany and South Korea. Here they are displaced by France and Finland. The activity table of top 20 cross-border deals (Figure 23) lists a total of 14 host countries. France, Germany, China, and India have multiple hosts, and Australia, Belgium, Denmark, Finland, New Zealand, Singapore, South Korea, Sweden, Switzerland, and Taiwan have a single host each. Indonesia and Japan are no longer listed as top hosts compared to the previous deal flow analysis table (Figure 22), while Germany, Belgium, Sweden, and Switzerland are included, highlighting more participation-oriented countries. The following tables refine the analysis of country affinity by including quantitative data. To capture the differences in variables, this table shows the top 30 country pairs.

Table 13: Top 30 country pairs — cross-border activity

CB	Nr.	Source	Host	Part.	DP	DF	% Part.	% DP	%DF	Activity
1	4	United Kingdom	United States of America	2,939	1,205	16,424	1.544%	1.307%	2.281%	1.711%
2	5	United States of America	United Kingdom	1,677	1,026	14,857	0.881%	1.113%	2.064%	1.352%
3	10	United States of America	Canada	949	489	5,102	0.499%	0.530%	0.709%	0.579%
4	11	United States of America	France	687	355	6,758	0.361%	0.385%	0.939%	0.562%
5	12	Canada	United States of America	1,122	355	4,792	0.590%	0.385%	0.666%	0.547%
6	14	United Kingdom	Germany	552	413	5,256	0.290%	0.448%	0.730%	0.489%
7	16	United Kingdom	France	580	407	4,756	0.305%	0.441%	0.661%	0.469%
8	17	United States of America	Germany	587	330	4,901	0.308%	0.358%	0.681%	0.449%
9	18	Germany	United States of America	910	341	2,712	0.478%	0.370%	0.377%	0.408%
10	19	United States of America	Japan	289	227	4,468	0.152%	0.246%	0.621%	0.339%
11	21	United States of America	Bermuda	105	44	5,798	0.055%	0.047%	0.805%	0.303%
12	22	Israel	United States of America	709	280	1,612	0.373%	0.304%	0.224%	0.300%
13	24	United States of America	Netherlands	323	164	2,962	0.170%	0.178%	0.411%	0.253%
14	25	Japan	United States of America	587	179	1,845	0.308%	0.194%	0.256%	0.253%
15	27	France	United States of America	576	191	1,388	0.303%	0.207%	0.193%	0.234%
16	29	United States of America	China	306	169	2,317	0.161%	0.183%	0.322%	0.222%
17	30	United Kingdom	Netherlands	132	92	3,361	0.069%	0.100%	0.467%	0.212%
18	31	United States of America	Israel	422	225	1,132	0.222%	0.245%	0.157%	0.208%
19	33	Taiwan	United States of America	444	186	1,261	0.233%	0.202%	0.175%	0.203%
20	34	United States of America	South Korea	152	105	2,858	0.080%	0.114%	0.397%	0.197%
21	36	United States of America	India	202	164	2,035	0.106%	0.178%	0.283%	0.189%
22	37	United States of America	Ireland-Rep	152	85	2,621	0.080%	0.093%	0.364%	0.179%
23	38	Netherlands	United States of America	250	100	1,950	0.131%	0.108%	0.271%	0.170%
24	39	Singapore	United States of America	371	118	1,184	0.195%	0.128%	0.164%	0.162%
25	42	United States of America	Australia	241	177	996	0.127%	0.192%	0.138%	0.152%
26	44	Switzerland	United States of America	355	137	859	0.187%	0.148%	0.119%	0.151%
27	45	United States of America	Singapore	133	104	1,773	0.070%	0.113%	0.246%	0.143%
28	46	United States of America	Luxembourg	28	18	2,782	0.015%	0.019%	0.386%	0.140%
29	47	United States of America	Hong Kong	185	121	1,296	0.097%	0.132%	0.180%	0.136%
30	49	Australia	United States of America	297	183	379	0.156%	0.198%	0.053%	0.136%

Legend: CB= Rank Cross-border; O= Rank Overall (domestic+cross-border); Part.= Participation; DP= Deal-participation; DF= Dealflow

The US and the UK are part of each top 30-country pair, with the US 16 times as source and 11 times as host. The UK is involved four times as source and only once as host, but here it is the largest host country for the US. United Kingdom activity is focused on neighboring countries Germany, France, and the Netherlands, while US activity is more diverse geographically. The table lists nine country pairs with investments in both directions, the US partnering with the following countries: Australia, Canada, France, Germany, Israel, Japan, the Netherlands, Singapore, and the UK. To sideline the impact of the US, the focus here is on cross-border deals without the US as source country. The table covers country pairs down to the rank of 65 and lists a total of 40 country pairs of cross-border deals, showing the US as source country 25 times within the top 65 rankings.[171]

Table 14: Top 40 cross-border country pairs excluding the United States as source

CB	Nr.	Source	Host	Part.	DP	DF	% Part.	% DP	%DF	Activity
1	4	United Kingdom	United States of America	2,939	1,205	16,424	1.544%	1.307%	2.281%	1.711%
5	12	Canada	United States of America	1,122	355	4,792	0.590%	0.385%	0.666%	0.547%
6	14	United Kingdom	Germany	552	413	5,256	0.290%	0.448%	0.730%	0.489%
7	16	United Kingdom	France	580	407	4,756	0.305%	0.441%	0.661%	0.469%
9	18	Germany	United States of America	910	341	2,712	0.478%	0.370%	0.377%	0.408%
12	22	Israel	United States of America	709	280	1,612	0.373%	0.304%	0.224%	0.300%
14	25	Japan	United States of America	587	179	1,845	0.308%	0.194%	0.256%	0.253%
15	27	France	United States of America	576	191	1,388	0.303%	0.207%	0.193%	0.234%
17	30	United Kingdom	Netherlands	132	92	3,361	0.069%	0.100%	0.467%	0.212%
19	33	Taiwan	United States of America	444	186	1,261	0.233%	0.202%	0.175%	0.203%
23	38	Netherlands	United States of America	250	100	1,950	0.131%	0.108%	0.271%	0.170%
24	39	Singapore	United States of America	371	118	1,184	0.195%	0.128%	0.164%	0.162%
26	44	Switzerland	United States of America	355	137	859	0.187%	0.148%	0.119%	0.151%
30	49	Australia	United States of America	297	183	379	0.156%	0.198%	0.053%	0.136%
32	51	United Kingdom	Sweden	186	137	991	0.098%	0.148%	0.138%	0.128%
34	54	Hong Kong	South Korea	44	30	2,034	0.023%	0.032%	0.283%	0.113%
36	58	Netherlands	United Kingdom	157	106	787	0.082%	0.115%	0.109%	0.102%
38	60	United Kingdom	Spain	96	69	1,138	0.050%	0.075%	0.158%	0.094%
41	65	United Kingdom	Ireland-Rep	102	64	904	0.054%	0.069%	0.126%	0.083%
42	66	United Kingdom	Italy	79	62	980	0.042%	0.068%	0.136%	0.082%
44	69	Belgium	United States of America	173	72	335	0.091%	0.078%	0.046%	0.072%
45	70	United Kingdom	Finland	101	78	551	0.053%	0.085%	0.076%	0.071%
46	71	United Kingdom	Switzerland	93	65	665	0.049%	0.070%	0.092%	0.071%
47	72	Hong Kong	United States of America	123	52	611	0.065%	0.056%	0.085%	0.069%
48	73	Sweden	United States of America	134	51	484	0.070%	0.055%	0.067%	0.064%
50	76	Hong Kong	China	62	36	722	0.033%	0.039%	0.100%	0.057%
51	77	United Kingdom	Belgium	51	34	748	0.027%	0.037%	0.104%	0.056%
52	78	Netherlands	France	64	32	621	0.034%	0.035%	0.086%	0.052%
53	79	Singapore	India	32	26	785	0.017%	0.028%	0.109%	0.051%
54	81	United Kingdom	Denmark	55	43	477	0.029%	0.046%	0.066%	0.047%
55	82	Australia	New Zealand	48	43	488	0.025%	0.046%	0.068%	0.046%
56	83	Sweden	Finland	60	45	409	0.032%	0.049%	0.057%	0.046%
57	84	Belgium	France	70	32	460	0.037%	0.034%	0.064%	0.045%
58	85	Switzerland	Germany	95	50	213	0.050%	0.055%	0.030%	0.045%
59	87	Finland	Sweden	86	65	124	0.045%	0.071%	0.017%	0.044%
60	88	Singapore	China	63	32	452	0.033%	0.035%	0.063%	0.044%
61	89	Malaysia	United States of America	95	59	107	0.050%	0.064%	0.015%	0.043%
62	90	France	Germany	98	49	168	0.051%	0.053%	0.023%	0.043%
64	93	Finland	United States of America	92	35	288	0.048%	0.038%	0.040%	0.042%
65	94	France	United Kingdom	75	40	305	0.039%	0.043%	0.042%	0.042%

Legend: CB= Rank Cross-border; O= Rank Overall (domestic+cross-border); Part.= Participation; DP= Deal-participation; DF= Dealflow

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[171]   For an overview of the top 300 country-pair combinations, see Appendix.

The table demonstrates that the first 33 country pair activities are dominated by the UK (five as source, one as host) and especially by the US (17 as source, 11 as host). The first country pair without participation of the US or UK is Hong Kong to South Korea, ranked 34th, followed by 11 other country pairs, in a confined range between rank 50 for Hong Kong / China to rank 62 for France / Germany. The US is listed as host country 15 times, with a high ranking different to the UK, with two listings of relatively low ranking (36, 65).

The results are combined to derive the sequences of host countries for each source country to support the assumption of the underlying distance and mass theory. The following table presents all 59 source countries ranked by most to least country-pair activity, with the top 10 most important host countries listed in descending order from left to right. Table 12 shows the largest concentration both by country pair and host sequence.

Table 15: Overview of importance of host country for source country

Rank	Source	Largest activity	Host country by activity 1	2	3	4	5	6	7	8	9	10
1	United Kingdom	1.711%	USA	Germany	France	Netherlands	Sweden	Spain	Ireland-Rep	Italy	Finland	Switzerland
2	USA	1.352%	United Kingdom	Canada	Japan	Bermuda	China	Israel	South Korea	India	Ireland-Rep	Australia
3	Canada	0.547%	USA	Germany	United Kingdom	France	China	India	Israel	South Korea	Brazil	Sweden
4	Germany	0.408%	USA	United Kingdom	Israel	France	Switzerland	Austria	Sweden	Netherlands	Canada	Italy
5	Israel	0.300%	USA	France	Japan	United Kingdom	Germany	Singapore	Netherlands	Denmark	Canada	
6	Japan	0.253%	USA	United Kingdom	South Korea	Hong Kong	China	Israel	Singapore	Malaysia	France	Sweden
7	France	0.234%	USA	Germany	United Kingdom	Switzerland	Belgium	Sweden	Netherlands	Spain	Italy	Canada
8	Taiwan	0.203%	USA	China	South Korea	Israel	France	Hong Kong	Japan	Canada	Australia	Singapore
9	Netherlands	0.170%	USA	United Kingdom	France	Germany	Belgium	Denmark	Switzerland	Sweden	Italy	Israel
10	Singapore	0.162%	USA	India	China	Australia	Hong Kong	United Kingdom	Indonesia	South Korea	France	Taiwan
11	Switzerland	0.151%	USA	Germany	France	Italy	United Kingdom	Sweden	Denmark	Canada	Israel	Austria
12	Australia	0.136%	USA	New Zealand	United Kingdom	Singapore	Hong Kong	Italy	South Korea	Canada	Indonesia	Netherlands
13	Hong Kong	0.113%	South Korea	USA	China	Singapore	Australia	Taiwan	India	Japan	Indonesia	Thailand
14	Belgium	0.072%	USA	France	United Kingdom	Netherlands	Germany	Switzerland	Spain	Israel	Ireland-Rep	Canada
15	Sweden	0.064%	USA	Finland	Denmark	France	Norway	Germany	Switzerland	United Kingdom	Netherlands	Belgium
16	Finland	0.044%	Sweden	USA	Denmark	South Korea	Norway	Switzerland	Netherlands	Estonia	Canada	Lithuania
17	Malaysia	0.043%	USA	Thailand	Singapore	India	Australia	United Kingdom	Hong Kong	South Korea	Germany	
18	India	0.041%	USA	South Korea	Singapore	United Kingdom	Indonesia	Canada	Sri Lanka	Denmark	Hong Kong	Germany
19	Denmark	0.037%	USA	United Kingdom	Sweden	Germany	Finland	France	Switzerland	Thailand	China	Croatia
20	Ireland-Rep	0.035%	United Kingdom	USA	Germany							
21	Italy	0.033%	USA	United Kingdom	Israel	France	Spain	Belgium	Germany	Netherlands	Ireland-Rep	China
22	South Korea	0.032%	USA	China	Hong Kong	Israel	Japan	United Kingdom	Austria	Argentina		
23	Norway	0.029%	USA	Sweden	Denmark	United Kingdom	Switzerland	Finland	Kenya	Germany	Canada	Sri Lanka
24	China	0.025%	USA	Hong Kong	Japan	New Zealand	Philippines	Taiwan				
25	Luxembourg	0.023%	France	USA	Germany	Sweden	Finland	United Kingdom	Netherlands	Italy	Kenya	Belgium
26	Mauritius	0.018%	India	USA								
27	Russian Federation	0.018%	USA	United Kingdom	Ukraine	Switzerland	France					
28	New Zealand	0.015%	USA	Australia	United Kingdom							
29	Czech Republic	0.014%	Poland	Hungary	Slovak Republic	USA	Bulgaria	Sweden	Estonia	Bermuda	Austria	Denmark
30	Austria	0.012%	Germany	Hungary	Switzerland	Czech Republic	India	Denmark	Bosnia	Russian Federati	Croatia	United Kingdom
31	Brazil	0.012%	USA	Argentina	Chile	Denmark	British Virgin					
32	South Africa	0.008%	USA	Netherlands								
33	Poland	0.008%	Czech Republic	Russian Federati	Romania	USA	Croatia	Slovak Republic	Bulgaria	Hungary	Ireland-Rep	Estonia
34	Spain	0.008%	USA	United Kingdom	Germany	Portugal	France	Netherlands				
35	Indonesia	0.007%	USA	Singapore								
36	Philippines	0.005%	USA	Singapore	China	United Kingdom	Malaysia	Canada				
37	Bermuda	0.004%	USA	India	Azerbaijan	United Kingdom	Kazakhstan	Russian Federati	Germany			
38	Greece	0.004%	Romania	Cyprus	Bulgaria	USA	France	Ireland-Rep	Macedonia	Moldova	Switzerland	
39	Romania	0.004%	Spain	Canada								
40	Netherlands Antilles	0.004%	France	Finland								
41	Madagascar	0.003%	USA	United Kingdom								
42	Hungary	0.003%	USA	Netherlands	Romania	Russian Federati	Belgium	Germany				
43	Portugal	0.003%	United Kingdom	Spain	USA	Poland	Germany					
44	Cayman Islands	0.003%	USA	Israel	Australia	United Kingdom						
45	Ukraine	0.002%	Moldova	USA								
46	Argentina	0.002%	USA	Brazil								
47	United Arab Emirates	0.001%	India	United Kingdom								
48	Iceland	0.001%	United Kingdom	USA	Norway							
49	Slovenia	0.001%	USA									
50	Saudi Arabia	0.001%	USA									
51	Chile	0.001%	Brazil	USA								
52	Estonia	0.001%	Russian Federati	USA								
53	Nigeria	0.001%	United Kingdom	South Africa	Israel							
54	Senegal	0.001%	Kenya	Uganda								
55	Thailand	0.001%	Singapore									
56	Costa Rica	0.001%	El Salvador									
57	Kuwait	0.001%	United Kingdom									
58	Sri Lanka	0.001%	USA									
59	Mexico	0.000%	Singapore									

The table ranks the percentage of global PE deal activity for each source country with primary host deal activity. The ranking indicates the degree of global deal concentration between a source country and its primary host. The UK is the largest source with the US as host, accounting for global activity of 1.7%. The US with host UK follows with 1.35%. The remaining source countries with their primary sources account for global activity under 1%.

The irregular sequences of host countries indicate that no valid global sequence of host countries exists for all source countries. Otherwise, each column by rank would have to contain the identical host country. Although previous analysis verified that the US is the primary host country with the expected large impact, 20 countries — one third — have different key trade partners. To identify patterns of country pair affinity, source countries are analyzed individually for a country-specific sequence. The UK focuses on the US and on European countries, especially neighboring countries: Germany, France, the Netherlands, Sweden, Spain, Ireland, Italy, Finland, Switzerland, Belgium, and Denmark. The US invests globally, although a sequence of United Kingdom, Canada, Japan, Bermuda, China, Israel, South Korea, India, Ireland, and Australia supports the assumption of country affinity through geographic and economic distance.

Similar pattern arise by investigating other source countries with their hosts, especially by source countries whose primary host is not the US, like Hong Kong / South Korea, Finland / Sweden, Ireland / United Kingdom, Luxembourg / France, Mauritius / India, Czech Republic / Poland, Austria / Germany, etc. The sequences emphasize which country is best adapted to niches in the global PE market when competing against large players like the US and the UK. The patterns indicate that the host selections are a mix of first-choice and next-best opportunities to compete against other players.

The analysis of cross-border investments identifies rules and patterns inherent in the country-pair combinations that are influenced by the role of large PE countries, such as the US and the UK. The patterns further support the assumption of the gravity model.

3.3.   Dynamics of cross-border activity — the gravity model over time

The analysis of dynamics combines the gravity model and the time series to investigate the evolution of cross-border activity and the shifts of propensity of

source countries toward other host countries. The analysis breaks down the observations into selected segments of country-pair combinations over time, focusing on the dynamics of boom, peak, and downturn. The analytic steps are a series of gravity model graphs by year, a tabular analysis of growth rate development, and further, a time series analysis of the US, UK, and Hong Kong, with their selection of first- and second-tier host countries compared to world activity.

The following graph shows the activity for host and source country pair for the years 1999 and 2000, and explores the dynamics for the year with the largest growth rate to the year with the highest volume (Chapter C.3.1.). The graph further lists the top 20 country pairs for each year and assigns growth rates for the year 2000.

Figure 24: Investment activity dynamics of source and host country for 1999 and 2000
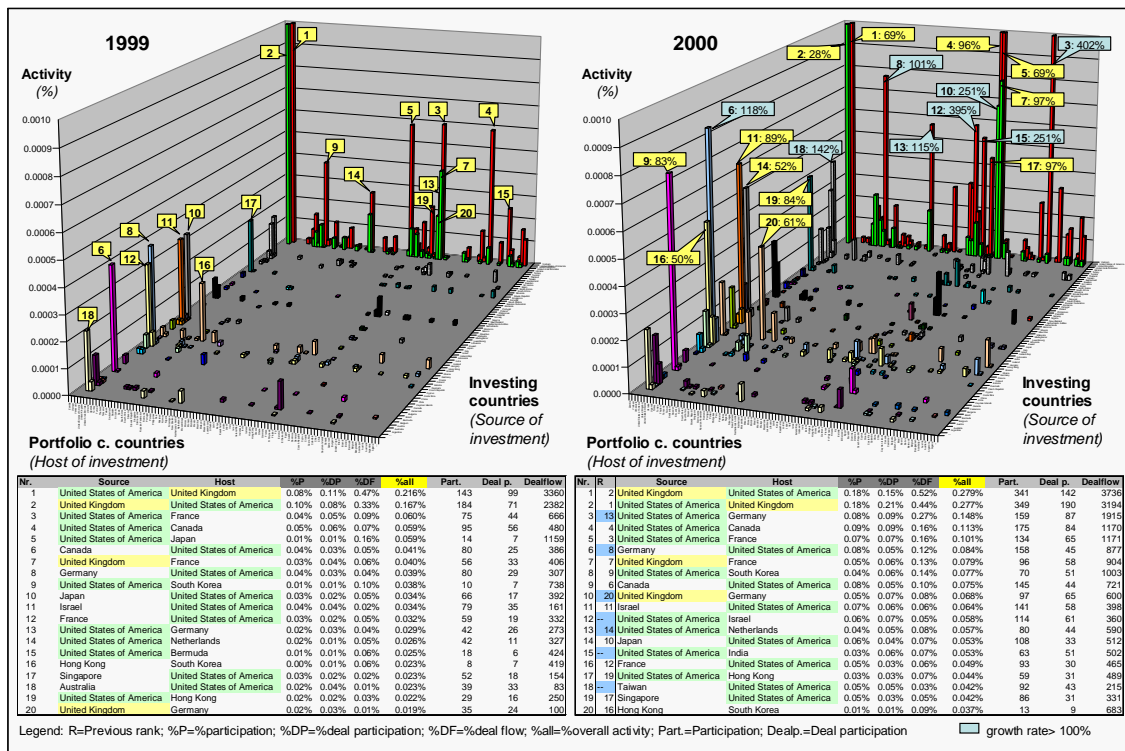
The graph shows the main patterns of activity for the US and the UK as source countries, and the US as host country with irregular distribution. The comparison of graphs validates not only large growth, but also relative shifts of activity, especially in the main arrays of the US. That PE activity is globally more

diversified in the year 2000 is indicated by emerging spots of country pair activity. Focusing on the top 20 country pairs for those two years (1999 and 2000), the pairs have growth rates between a minimum of 28% for the US to UK, and a maximum of 402% for the US to Germany. A growth rate larger than 100% covers the following eight country combinations: the US as source country investing in Germany, South Korea, Israel, India, and the Netherlands; Germany and Taiwan as source countries investing in the US; and the UK investing in Germany. The different growth rates indicate relative changes of supply and demand between the countries, causing shifts within each country constellation. Column R shows the change in rank for each country pair between 1999 and 2000. The major upward shifts are the new country pairs (US / Israel, US / India, and Taiwan / US displacing the country pairs US / Bermuda, US / Japan, and Australia / US) from the top 20 list. The top country pair in 2000 is UK / US, changing rank with the country pair US / UK in 1999. Further significant upward shifts are US / Germany and UK / Germany, improving by 10 ranks each. Major downshifts are Japan / US, France / US, and Hong Kong / South Korea. The relative transactions in the global system with the intersection of country pairs are analyzed further in the next step. The list of the top 20 country pairs for the year 2000 is here expanded to 30 countries and focuses on the boom, peak, and downturn for these countries as seen by the changes in their growth rates for the years 1998 through 2001. The table lists the four dependent variables for four years, illustrating positive growth rates in a green background, negative growth rates in a yellow background; positive changes in growth rate are highlighted in black letters while negative changes in growth rate are highlighted in red letters. The minimum, maximum, and average growth rates of the 30 country pairs are listed for comparison at the bottom. The country pairs account for 57.53% of activity in 1998, 68.70% in 1999, 67.53% in 2000, and 55.11% in 2001.

Table 16: Growth rates of the top 30 country pairs in 2000 for the years 1999 to 2001

Growth rates of top 30 country pairs in the year 2000 from 1999 to 2001

Nr.	Source	Host	Participation				Deal participation				Deal flow				Activity			
			1998	1999	2000	2001	1998	1999	2000	2001	1998	1999	2000	2001	1998	1999	2000	2001
1	United Kingdom	United States of America	38%	50%	85%	-29%	58%	-2%	101%	-23%	245%	122%	57%	-64%	109%	73%	69%	-49%
2	United States of America	United Kingdom	112%	64%	144%	-37%	78%	74%	92%	-27%	198%	344%	-5%	-52%	133%	205%	28%	-43%
3	United States of America	Germany	5%	83%	279%	-55%	55%	61%	234%	-52%	95%	149%	601%	-75%	46%	97%	402%	-66%
4	United States of America	Canada	100%	138%	84%	-11%	76%	99%	51%	-6%	146%	84%	144%	-49%	106%	102%	96%	-27%
5	United States of America	France	25%	200%	79%	-43%	48%	169%	48%	-40%	-48%	867%	76%	-59%	-1%	344%	69%	-51%
6	Germany	United States of America	16%	116%	98%	-31%	25%	122%	53%	-2%	14%	366%	185%	-63%	18%	171%	118%	-41%
7	United Kingdom	France	19%	124%	71%	-43%	8%	100%	77%	-47%	88%	384%	123%	-61%	26%	185%	97%	-53%
8	United States of America	South Korea		43%	600%	-61%		37%	652%	-64%		293%	36%	-42%			227%	101%	-51%
9	Canada	United States of America	47%	82%	81%	-11%	68%	43%	76%	-4%	51%	160%	87%	-19%	54%	96%	83%	-13%
10	United Kingdom	Germany	33%	75%	177%	-23%	66%	51%	172%	-26%	22%	-15%	498%	29%	39%	32%	251%	-3%
11	Israel	United States of America	164%	172%	78%	-23%	244%	102%	65%	-24%	42%	345%	147%	-17%	164%	161%	89%	-22%
12	United States of America	Israel	-50%	167%	375%	-45%	-39%	74%	420%	-55%	-28%	274%	389%	-48%	-41%	141%	395%	-50%
13	United States of America	Netherlands	146%	31%	90%	-61%	141%	-22%	296%	-56%	844%	269%	80%	-75%	207%	79%	115%	-67%
14	Japan	United States of America	-17%	175%	64%	-39%	-3%	96%	94%	-46%	10%	790%	31%	-63%	-8%	282%	52%	-51%
15	United States of America	India	43%	110%	200%	-51%	18%	152%	166%	-50%	-45%	515%	427%	-20%	7%	188%	251%	-37%
16	France	United States of America	20%	146%	58%	-42%	-18%	175%	62%	-34%	27%	707%	40%	-78%	7%	279%	50%	-56%
17	United States of America	Hong Kong	40%	314%	103%	-51%	40%	129%	93%	-31%	1060%	641%	96%	-74%	89%	322%	97%	-57%
18	United States of America	Taiwan	57%	14%	124%	-25%	63%	-23%	168%	-32%	2%	29%	136%	9%	44%	0%	142%	-20%
19	Singapore	United States of America	-29%	247%	65%	-40%	56%	112%	75%	-54%	-22%	386%	115%	-42%	-5%	218%	84%	-44%
20	Hong Kong	South Korea	0%	700%	63%	-38%	0%	583%	38%	-57%		8643%	63%	-80%	41%	2966%	61%	-76%
21	United States of America	Brazil	20%	83%	318%	-46%	33%	-3%	294%	-46%	61%	36%	217%	-51%	45%	31%	255%	-48%
22	United States of America	Japan	-83%	600%	329%	-67%	-83%	244%	384%	-58%	-100%	--	-82%	278%	-84%	--	-45%	38%
23	United States of America	Italy	33%	183%	97%	-36%	24%	111%	71%	-27%	-49%	243%	146%	-43%	0%	162%	99%	-35%
24	Switzerland	United States of America			320%	-52%	-100%		335%	-45%	-100%		--	-91%	-100%		--	-78%
25	United States of America	Luxembourg			50%	-100%			-43%	-100%			514%	-100%			308%	-100%
26	United States of America	China	-36%	189%	69%	-52%	-33%	58%	106%	-46%	-89%	2172%	95%	143%	-47%	204%	90%	21%
27	United Kingdom	Sweden	-41%	-13%	105%	-63%	-35%	-30%	61%	-24%	-21%	39%	429%	23%	-36%	-10%	188%	-10%
28	Netherlands	United States of America		300%	200%	-28%		255%	227%	-38%		175%	321%	-13%		241%	243%	-27%
29	Australia	United States of America	225%	200%	23%	-15%	158%	217%	-8%	-5%	1165%	252%	-17%	-44%	218%	217%	0%	-14%
30	Hong Kong	United States of America	100%	350%	300%	-47%	-33%	279%	513%	-45%		608%	760%	-57%	39%	381%	495%	-51%
		maximum	225%	700%	600%	-11%	244%	583%	652%	-2%	1165%	8643%	760%	278%	218%	2966%	495%	38%
		minimum	-83%	-13%	23%	-100%	-100%	-30%	-43%	-100%	-100%	-15%	-82%	-100%	-100%	-10%	-45%	-100%
		Average of 30 pairs	38%	197%	171%	-44%	34%	134%	180%	-41%	168%	1002%	218%	-20%	35%	373%	160%	-38%
		positive growth rate	20	27	30	0	19	23	28	0	16	26	26	5	18	26	28	2
		negative growth rate	6	1	0	30	8	5	2	30	9	1	3	25	9	1	1	28
		increasing growth rate		24	13	0		20	16	1		20	10	2		19	11	1
		decreasing growth rate		4	17	30		8	14	29		7	19	28		8	18	29

The overall comparison of the time series indicates a positive average growth rate for the years 1998, 1999, and 2000, and a negative rate for the year 2001, which is confirmed by the overall time series analysis of Chapter C.2.1. A different pattern of growth rate occurs between the country pairs by year and dependent variable. The year 1998 has an irregular pattern, with six to nine negative growth rates for the dependent variables. The years 1999 through 2001 have a regular pattern, with one to two negative rates per year for participation and activity, but excluding deal participation, with four negative rates in 1999, and deal flow, with five positive rates in 2001. Even the growth rates that indicate the same general orientation per year exhibit extreme volatility, especially for deal flow, with -100% to 1,165% for 1998, -15% to 8,643% for 1999, -82% to 760% for 2000, and -100% to 278% for 2001. The growth rate analysis identifies the intersection of a global trend and a country pair-specific trend. To focus precisely on the relative shift in country affinity, the sensitive changes of growth rates[172] are compared, with increasing or decreasing growth rates across country pairs. In Table 16, black letters mark the speed-up in growth, red letters the slow-down

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[172] Second derivative of the function of private equity time series.

in growth. The year 1999 is characterized by increased growth for 1/5 to 1/3 of the country pairs, while growth slows down in the year 2000 for 1/2 to 1/3 of the country pairs. In the downturn of 2001, almost all country pairs have a negative growth rate, with the exception of US / Japan for deal flow activity and US / China in deal flow.

Comparing growth rates and illustrating nuances by the change in growth rate more easily identifies successful country-pair constellations by year. When looking at source countries and their hosts, a shift in affinity can be observed. The US is listed with its four main hosts for 2000 on ranks 2 through 5: the UK, Germany, Canada, and France. Each of these four country pairs has a different investment pattern. While the investments in Canada have a constant growth rate of ~100% per year until 2000, growth rates in the UK and France reach their peak of 204% and 344% in 1999, with less slowdown for France in 2000. Germany has a different pattern. Compared to the other hosts, it reaches its peak of 402% in 2000 from a moderate growth rate of 97% in 1999.

These patterns verify a shift in host country focus and changes in competition through balancing of supply and demand within the whole system. The countries compete for each others' target companies, simultaneously competing against the foreign investors in their own domestic market.

To investigate the dynamics of competition in domestic and cross-border investments, the US, UK, and Hong Kong are selected as main cross-border source countries of North America, Europe, and Asia. They are analyzed by total investment, and by growth rate of their first-tier and second-tier hosts over time. Their host country investments are analyzed to identify a cyclical or anticyclical trend within the countries compared to the global PE trend: the US with hosts UK (2)[173] and Canada (4), the UK with hosts US (1) and Germany (10), and finally Hong Kong with hosts South Korea (20) and the US (30). The following graph presents these three countries and global development in a time series from 1980 through 2005. Each graph is split further into three sections: *first*, from 1991 through 1995 (1) with the beginning of cross-border activity; *second*, the boom phase from 1996 through 2000 (2) with largest growth rate and global maximum;

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[173] The numbers present the rank of the country pairs of the previous table.

and *third*, the downturn from 2001 through 2005 (3). In each graph, the activity is presented in a bar chart with H_0 as domestic deals, H_1 as tier-one host, H_2 as tier-two host, and H_R as remaining host countries. The hosts H_1, H_2, and H_R add up to total cross-border activity, incorporating H_0 results in the overall activity of the source country. The growth rates are presented in a line chart with the same colors as the bar chart.[174]

Figure 25: Activity development over time for world and selected source countries
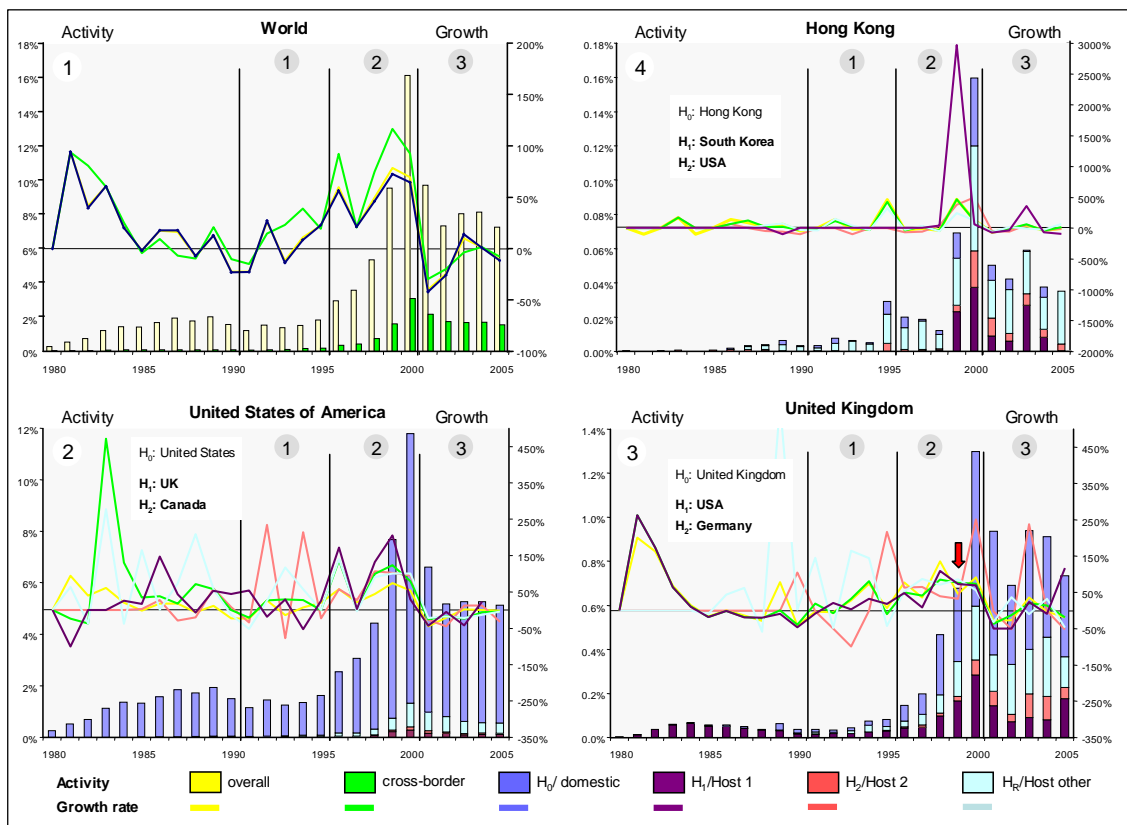
The first graph (1) presents **global activity** with the pattern from the previous time series (Chapter C.2.1.). The growth rates for overall and domestic deals have a cyclical pattern, with little disturbance in the first section. The cross-border deals have more volatility, with positive growth especially in 1994, with +39% growth, while domestic deals decline in the 1993, with -14%. In section two,

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[174] To verify the cyclicality of growth rates within each section; the three correlations of growth rates between domestic (H_R) to cross-border ($H_1 + H_2 + H_R$); H_1 to H_2 and H_1 to H_R; are calculated (see Appendix).

cross-border growth rates have a first relative maximum in 1996, with 93%, and an absolute maximum in 1999, with 116%. Domestic deals follow the same pattern but with a slower growth rate of 56% and 72% for 1996 and 1999 respectively. The largest decline is for all investments in the year 2001. Cross-border deals decline by 30% and domestic deals by 42%. Domestic deals experience positive growth of 14% again in 2003, but the cross-border growth rate is still negative at -4%, reaching positive growth of 1% in 2004.

The US has the largest domestic market relative to its cross-border market. The correlation of growth rates for domestic to cross-border, and for domestic to host UK, has a small positive medium correlation,[175] whereas the pattern between the hosts UK and Canada, and between the UK and the rest of the world, are indifferent.

Focusing on section one first, the coefficient for domestic to cross-border is positive medium, indicating an overall positive investment climate. The result for investment in the UK and Canada is largely negative, with anticyclical investment between the main host countries. The coefficient for the UK and the rest of the world is medium negative, illustrated by anticyclical patterns in the graph.

Section two — focusing on the boom of PE activity — has overall positive, highly correlated growth rates, indicating a cyclical trend with no limitation in host selection in times of high supply and demand.

Section three describes the downturn in activity. The coefficients are positive for domestic to cross-border deals. The pattern for section three is cyclical with little disturbance. Domestic investment recovers early, while cross-border deals follow after some time. The result for the UK to Canada is indifferent, while the highly positive correlation coefficient for the UK and the rest of the world verifies a similar reduction of investment in the downturn.

Overall, the analysis confirms an anticyclical selection — with substitution of host countries — from 1991 through 1995; a cyclical selection during the boom, balancing supply and demand on a high level; and a cyclical pattern during downturn, when supply and demand vanishes.

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[175] The correlation of growth rates is calculated for the different hosts; cross-border; and domestic deals (see Appendix).

The UK has a large proportion of cross-border deals. Cross-border investments are diversified into the US, Germany, and the rest of the world. Investment growth rates have volatile amplitudes without a distinctive pattern. The overall correlation for domestic to cross-border, and the selection among the US, Germany, and the rest of the world, are small to indifferent. In section one (1) the domestic to cross-border curves illustrate a medium correlation. The investments in the US and Germany are correlated, although with volatile growth in Germany. Investment in the US and the rest of the world shows a negative relation. Section two has constant positive and almost highly correlated growth development for domestic cross-border and host development, with cyclical growth rates — though with an increasing growth rate in Germany, while the remaining hosts decline in growth. In section three the decline is highly correlated for domestic to cross-border, whereas the pattern for the US and Germany illustrates indifferent behavior, while the graph of investment in the rest of the world identifies a negative correlation to the main host, the US.

The last country profile is Hong Kong, with dominant cross-border activity compared to domestic deals, and with high amplitude of growth rates in the years 1999 and 2000. The correlation between domestic to cross-border, and between host South Korea and the US, is very high, whereas investment relations between those entities investing in the US and the rest of the world are indifferent.

The graphs for section one (1) indicate a high correlation between domestic and cross-border deals. Section two has constant large growth development with a high correlation of domestic to cross-border, and medium correlation in investment focus between the US and South Korea. In section three the decline is negative-correlated for domestic to cross-border, with a large decrease in domestic deals, and positive-correlated for the two main hosts.

The patterns are different from the profiles of the US and the UK. Hong Kong is highly concentrated on cross-border deals, as shown by the high correlation of host countries and the negative correlation between domestic and cross-border activity. Even after the downturn, cross-border activity remains on a high level compared to domestic deals.

The development of the top country pairs over time (Table 16) and the investment series of the countries US, UK and Hong Kong (Figure 25) identify a

shift in propensity toward foreign target companies and simultaneously toward their own domestic market over time.

The shifts further verify the application of the three-dimensional gravity model, which breaks down the propensity in time constant into time-variant determinants, which changes the country pair affinity relative to the global system.

3.4. Dynamics of partnering and investment

The analysis explores the dynamics of partnering and investment in a PF company by comparing domestic and cross-border investment. Changes are investigated by the defined deal types (Chapter B.2.3.1.) in the four distinct categories: first deal, deal mix, new deal, and refinance, with the subcategories of single and multiple investors. The following graph illustrates the development over time of deal flow for domestic deals and cross-border investment for the period 1980 through 2005, with a focus on the boom phase and the downturn phase of PE.

Figure 26: Deal type development over time
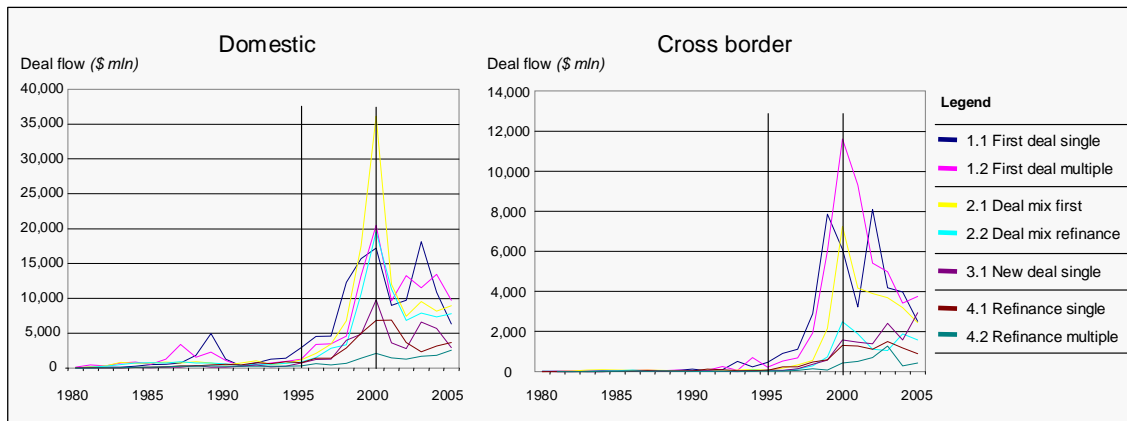
These two series show different patterns of domestic and cross-border PE activity. In the domestic deal view, all categories increase until the year 2000 — the boom phase. The largest group until the year 1998 is first-deal-single, relating to single investor deals. In 1999, shifts take place within the groups, with a large increase in deal-mix-first, referring to deals where a new co-investor joins previous investors financing a company. This category has its maximum in 2000,

with twice the amplitude as the categories first-deal-single, first-deal-multiple and deal-mix-refinance.

In the cross-border deal, the categories increase until 2000 except for first-deal-single, which has a significant decline in 1999 after its relative maximum. The largest group until 1999 — similar to domestic deals — is first-deal-single, which was replaced by the large increase of first-deal-multiple. This had its maximum in 2000 at twice the size of first-deal-single and deal-mix-first. The downturn in domestic investment shows a decrease in all deal types, with volatile shifts from 2001 on. First-deal-multiple investments have an early increase, outrun by first-deal-single investments in 2003 reaching its maximum. The deal-mix-first group has the largest decline, although it balances below first-deal and above new-deal-single investments. New-deal investments have a relative increase in 2003, verifying a selling-on from former PE investors.

During the downturn of cross-border deals, the first-deal-multiple investments decline, but remain on a high level in 2001. While first-deal-multiple investments rapidly decline in 2002, first-deal-single investments rise to their maximum. Deal-mix-first slowly decreases after 2001, while new-deal rises steadily, with volatility from 2000 on.

The time series indicate that investors are looking for single deals, except that in boom times they tend to partner in domestic as well in cross-border deals. The partnering differs: In domestic deals, investors' participation increased as new co-investors enter a deal arrangement with an established investor, while in the cross-border segment, partnering in the first deal is the preferred arrangement.

3.5. Investment activity scaled by gross domestic product

To compare country activity in proportion to country size, the activity has to be scaled by country mass. The recommended variables for country size are population, land area, GDP, etc., as listed in the overview of independent variables for the explicative analysis (Chapter B.3.2.3.2.). With reference to economic mass, the time-variable GDP of the source country is used to scale PE activity.[176] This analysis uses the design of the panel data and gravity model

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[176] **Jeng and Wells,** The Determinants of Venture Capital Funding: Evidence Across Countries.

graphs, similar to the previous sections, with tables of ranked countries and country pairs. The analysis is confined to deal flow / GDP. The first table is a cross-section analysis of the top 20 source countries by GDP, over the years 1980 through 2005 for overall and cross-border investment.

Table 17: Top countries for deal flow / GDP

Overall (domestic+cross-border)			Cross-border			
Rank	Source	Dealflow/ GDP	CB	Rank	Source	Dealflow/ GDP
1	United States of America	0.06202	1	3	Singapore	0.03753
2	United Kingdom	0.04812	2	4	Hong Kong	0.03531
3	Singapore	0.04420	3	5	Mauritius	0.02922
4	Hong Kong	0.04107	4	7	Luxembourg	0.02587
5	Mauritius	0.02922	5	2	United Kingdom	0.02551
6	Israel	0.02692	6	6	Israel	0.01612
7	Luxembourg	0.02588	7	9	Netherlands	0.00991
8	Sweden	0.01904	8	8	Sweden	0.00953
9	Netherlands	0.01162	9	1	United States of America	0.00753
10	Finland	0.01040	10	13	Switzerland	0.00663
11	Australia	0.01039	11	12	Canada	0.00657
12	Canada	0.01035	12	10	Finland	0.00556
13	Switzerland	0.00776	13	15	Taiwan	0.00489
14	France	0.00700	14	16	Belgium	0.00429
15	Taiwan	0.00598	15	23	Malaysia	0.00312
16	Belgium	0.00565	16	11	Australia	0.00289
17	Denmark	0.00509	17	17	Denmark	0.00236
18	Ireland-Rep	0.00502	18	29	Madagascar	0.00196
19	South Korea	0.00372	19	14	France	0.00191
20	Norway	0.00372	20	25	Germany	0.00187

Legend: CB= Rank Cross-border

For overall PE investment, the important countries scaled by GDP are the US and UK, followed by relatively small countries — Singapore, Hong Kong, Mauritius, Israel, and Luxembourg. Mauritius is an outsider in this list because of its high ratio of low PE activity to low economic mass, and has overall no significant impact. The cross-border table lists Singapore, Hong Kong, Mauritius, and Luxembourg, followed by the UK, Israel, the Netherlands, Sweden, and the US, as important PE countries, with clear emphasis on the US and the UK, putting the small but highly active countries Singapore, Hong Kong, and Luxembourg on top. The countries can be seen as financial hubs for cross-border investment, with a high density of PE investment compared to their economic mass measured in GDP.

3.5.1. Investment by source country over time

The panel data analysis investigates each of the 70 source countries for the period 1980 through 2005. The graphs show deal flow / GDP by source country over time for overall deals (domestic + cross-border) and cross-border deals. The top 20 countries of deal flow / GDP are numbered. As described in the previous panel series, a similar slope at a particular point identifies similarity in country

activity, while the intercept displays amplitude as a scale factor. With GDP as a time variable, scaling affects the amplitude and shape of any particular country curve. Comparing the scaled graph to the unscaled panel data set (Chapter C.3.1.), the differences in shape are marginal compared to the shifts in amplitude, which is where the focus is.

Figure 27: Panel data — deal flow to GDP
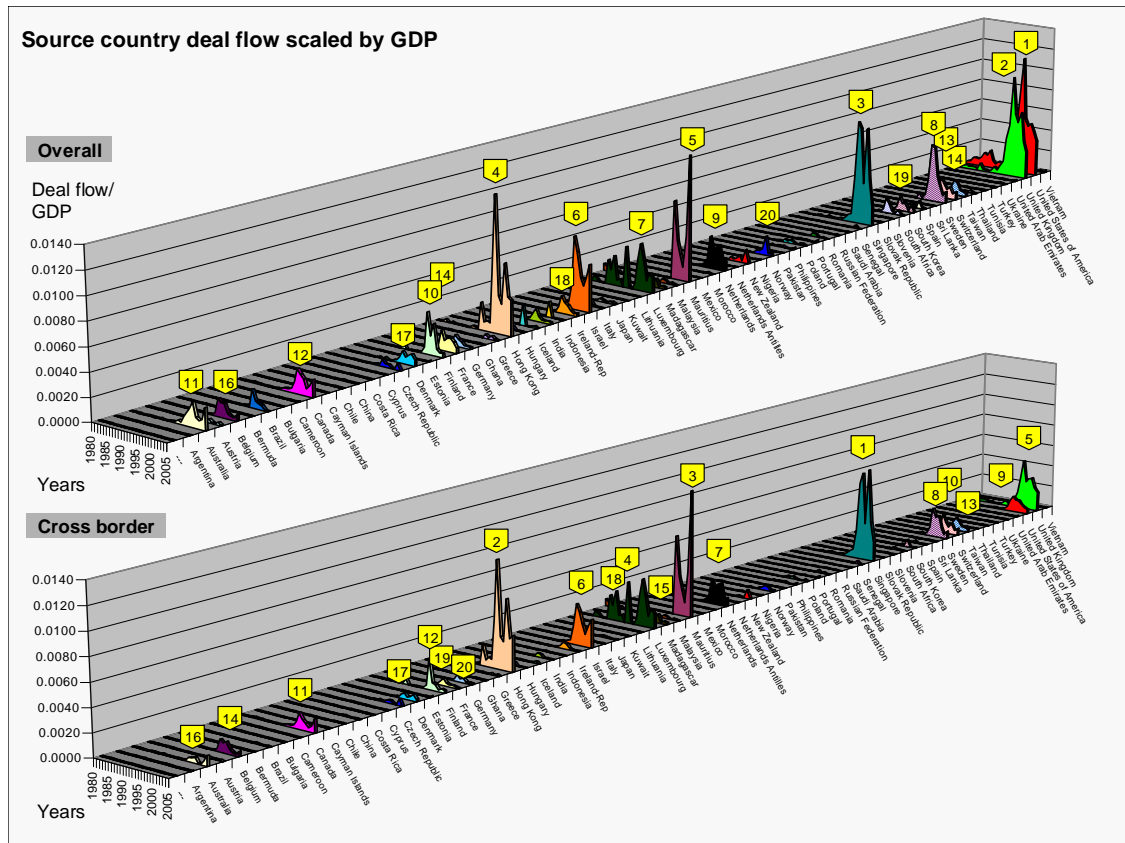
The time series patterns show high volatility of activity within and between the country time series. The different patterns of the countries — especially top countries like the US, UK, Hong Kong, and Singapore — were analyzed in the previous unscaled panel data set. When comparing lesser PE density countries with high PE density countries — Singapore, Hong Kong, Mauritius, and Luxembourg — the time series patterns differ across countries. While Singapore, Hong Kong, and Mauritius have large amplitudes in 2000 and 2003, Luxembourg has more steady deal flow from the early '90s, with peaks in 1996 and 2001. Comparing overall and cross-border deal flow, the absolute changes in amplitude for Singapore, Hong Kong, Mauritius, and Luxembourg are minimal. This

indicates that the focus of these countries is on cross-border investment, compared to the changing amplitudes between overall and cross-border activity of the UK and the US.

The panel data analysis refers to different types of PE centers. The US and the UK have large domestic and cross-border markets, whereas the smaller countries are financial hubs with a high density of PE, especially for cross-border investment.

3.5.2. Investment from source country to host country

The following analysis investigates country pair affinity scaled by the GDP of the source country.[177] The top 20 cross-border investments are highlighted.

Figure 28: Country pair activity by deal flow to GDP

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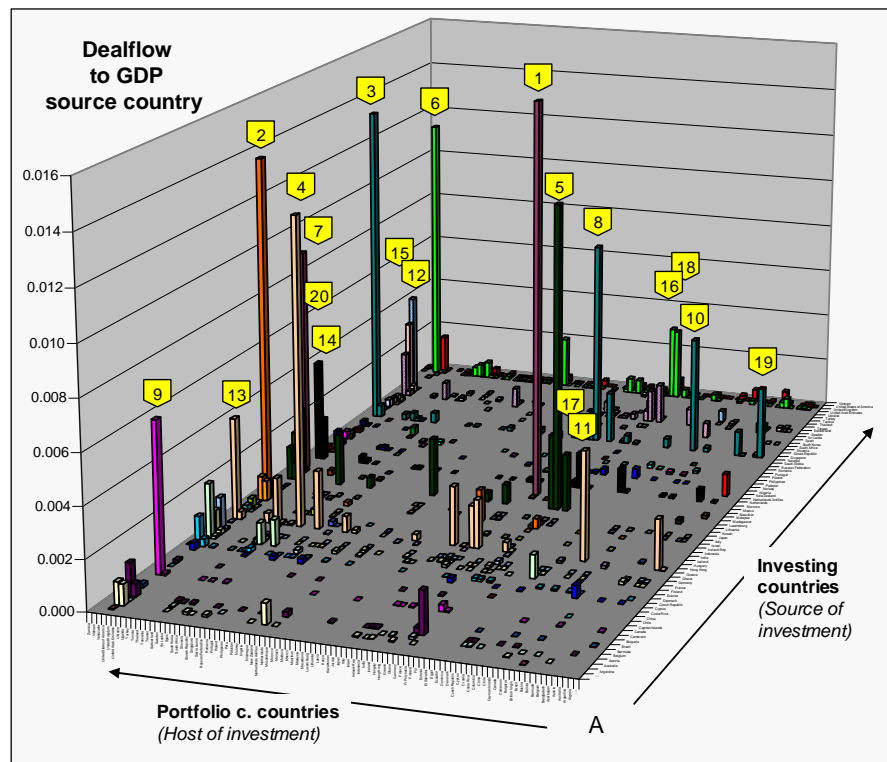
[177] See **Cumming, D. J. and Macintosh, J. G.,** Boom, Bust and Litigation in Venture Capital Finance, *Willamette Law Review*, *49*(4), pp. 867-906.

This graph shows highly volatile amplitudes without the distinctive patterns evident in previous graphs. Cross-border deals with the US and the UK as source countries are reduced significantly, except for the UK into the US (6), while cross-border deals into the US increased for several countries. Further, several columns stand out, like the one for the greatest cross-border country pair activity from Mauritius into India (1) and, as expected, the country series for Hong Kong, Singapore, and Luxembourg are amplified. The 20 largest country pairs in detail are:

Table 18: Top 20 cross-border deal country pairs

Country pair: Cross-border			
Rank	Source	Host	Dealflow_GDP
1	Mauritius	India	0.02013
2	Israel	United States of America	0.01378
3	Singapore	United States of America	0.01334
4	Hong Kong	South Korea	0.01239
5	Luxembourg	France	0.01234
6	United Kingdom	United States of America	0.01137
7	Mauritius	United States of America	0.00909
8	Singapore	India	0.00838
9	Canada	United States of America	0.00601
10	Singapore	China	0.00478
11	Hong Kong	China	0.00435
12	Taiwan	United States of America	0.00416
13	Hong Kong	United States of America	0.00408
14	Netherlands	United States of America	0.00407
15	Switzerland	United States of America	0.00311
16	United Kingdom	Germany	0.00308
17	Luxembourg	Germany	0.00303
18	United Kingdom	France	0.00298
19	Singapore	Australia	0.00297
20	Malaysia	United States of America	0.00261

Figure 28 combined with Table 18 identify the largest cross-border country pairs and the density of activity toward particular countries.

The top 20 country pair listing, in combination with the graph, verifies a concentration into 11 source countries, with Singapore listed four times, Hong Kong and the UK three times each, and Luxembourg and Mauritius listed twice each as source countries. The host deal flow is highly concentrated into seven countries, with the US listed 10 times. Other host countries are China, France, Germany, and India (listed twice each), and Australia and South Korea (once each).

The largest country pair is Mauritius / India. In absolute numbers, both are small PE countries. Mauritius's activity is highly concentrated into India and the US only; no other trade partners are listed. The second largest country pair is Israel investing into the US. Excluding the US, the sequence of smaller countries with

multiple host countries lists Singapore, with investments into India, China, and Australia; Hong Kong, with investments into South Korea and China; and Luxembourg, with investments into France and Germany. To investigate their global diversification or even concentration, each source country is analyzed by its number of host countries. Singapore with 28 hosts and Hong Kong with 22 are highly diversified; Luxembourg with 11 hosts and Israel with 9 are more confined in their selection of partnering countries; and Mauritius is highly concentrated on India and the US exclusively. The countries' high PE density and global reach underscore these countries' relevance as financial centers. The top five cross-border financial centers are Singapore, Hong Kong, Luxembourg, the UK, and Israel.

3.6.   Descriptive analysis results

Prior chapters analyzed investment activity across countries and time, based on the research models of time series, cross-section analysis, panel-data analysis, and the gravity model approach. The measured variables are participation, deal participation, deal flow, and activity expressed as a percentage.

The **time-series** approach was used to examine a boom and downturn of PE investment within the short time period of 1995 through 2005, with the peak in 2000, the highest growth rate in 1999, and the decline in 2001. Different patterns arise in the comparison of company stage investments (VC and PE) as well as in the comparison of overall to cross-border deals. PE had a large second peak in 2003; VC saw a slow decline from 2001 on. Compared to overall deals, cross-border deals experienced second peaks for VC in 2001 and a smaller peak for PE in 2003. When comparing measurable variables, a shift toward higher participation compared to deal participation is seen.

The **cross-section** analysis investigates the **99** countries studied here as source and host country, and by country overall activity. Each of those was divided into domestic and cross-border deals for the period 1980 through 2005. This analysis further ranks each country by the measurable variables and identifies the countries for explicative analysis. The overall analysis identifies **99** countries—**70** with source activity and **95** with host activity. The cross-border analysis identifies **97** countries — **59** with source activity and **93** with host activity.

Significantly, the cross-section verifies a wide pattern of country activity, especially for countries playing the dual roles of source and host, and in both domestic and cross-border investment. This analysis is enhanced by extending it to panel data and the gravity model to investigate underlying patterns.

The **panel-data** analysis compares the time series across countries to identify similarity in PE behavior over time. The curves show high volatility across countries, although a cyclical pattern between countries with similar growth rates is seen, especially in the years 1999, 2000, and 2001, indicating the intersection of a global trend with country-specific trends. The comparison of overall and cross-border activity identifies countries with similar cross-border and overall curves, like Hong Kong and Singapore. The analysis shows that countries differ in their focus toward domestic or cross-border activity over time.

Diversification into the measurable variables shows countries with varying amplitudes for each variable, indicating different country characteristics by number of deals relative to deal size.

The **gravity model** shows first the country pair deal concentration as quantified by different measurable variables. It identifies three main streams of activity: first, the domestic deal concentration; second, the US and the UK as dominant source countries; and third, the US as large host country. The gravity model further reveals country propensity toward particular trading partners and different levels of diversification, indicating patterns inherent in country-pair combinations that are influenced by large PE countries, notably the US and the UK. The patterns support the assumption of the gravity model, which states that the proximity between countries and larger country mass increase cross-border activity.

The **gravity model over time** investigates the evolution of cross-border activity and the shifts of propensity between the countries. The country pair snapshots of the year with the largest growth rate (1999), and the year with the absolute global maximum (2000) clearly illustrates shifts in country focus activity. Different growth rates within country pairs demonstrate the intersection of a global trend for growth rates in the years 1998 through 2000, a decline in 2001, and a country pair-specific trend. The interaction of countries with their shift toward interest in different host countries is presented for the US, UK, and Hong Kong, showing cyclical and anticyclical behavior in the selection of host countries by a single country as well as by different countries in different time periods. This indicates

that country pair-specific correlations exist at any given time that balance the whole system. A disturbance in one country affects all dynamics in the system due to relative shifts in other countries, and thus rearranges the constellation for all countries.

The dynamics of the **partnering and investment sequence** captures shifts in investment behavior over time by multi-investor deals or by refinancing a company in several investment rounds. The time series indicate that investors primarily invest in single deals. Changes occur in the boom and downturn, beginning in 1997, with different behavior for domestic and cross-border deals. Partnering in a cross-border deal as first investors is the preferred arrangement when investing abroad, while in domestic deals investors participate increasingly as new co-investors in a deal arrangement with an established investor.

Investment activity scaled by GDP accounts for country size by economic mass and identifies high-density PE countries as financial centers for domestic and cross-border activity across time and by country pairs. The top five cross-border countries with extensive global diversification are Singapore, Hong Kong, Luxembourg, the UK, and Israel.

The main results of the **descriptive analysis** are mapped to analyze the global distribution of cumulative cross-border activity. Countries are classified by geographical distance and by the amount of their cross-border PE activity as source and host country from 1980 through 2005. The graph further summarizes deal activity by continent with transcontinental activity. Two subgraphs highlight Europe in detail and country activity by GDP, with source and host activity as percentages, to evaluate their relative global importance as financial centers. Country activity is expressed by concentric circles, and financial centers are highlighted in red.

The circles (in the graph below) visualize cross-border activity of countries as source, host, and overall, with the net balance being the difference between the source and host circle area. Net importer countries — with less source activity than host activity — have the smaller green source activity circle centered (like Germany), while net exporter countries, with more source than host activity, have the smaller yellow host activity circle centered, like the US or the UK. This view shows countries in a relational global system — visualizing the gravity model according to economic mass and distance.

The grouping of countries by region as source and host delineates the competitive environment as density of cross-border activity measured in the level of PE activity and geographic distance of countries to each other.

Figure 29: Geographic overview of private equity country activity
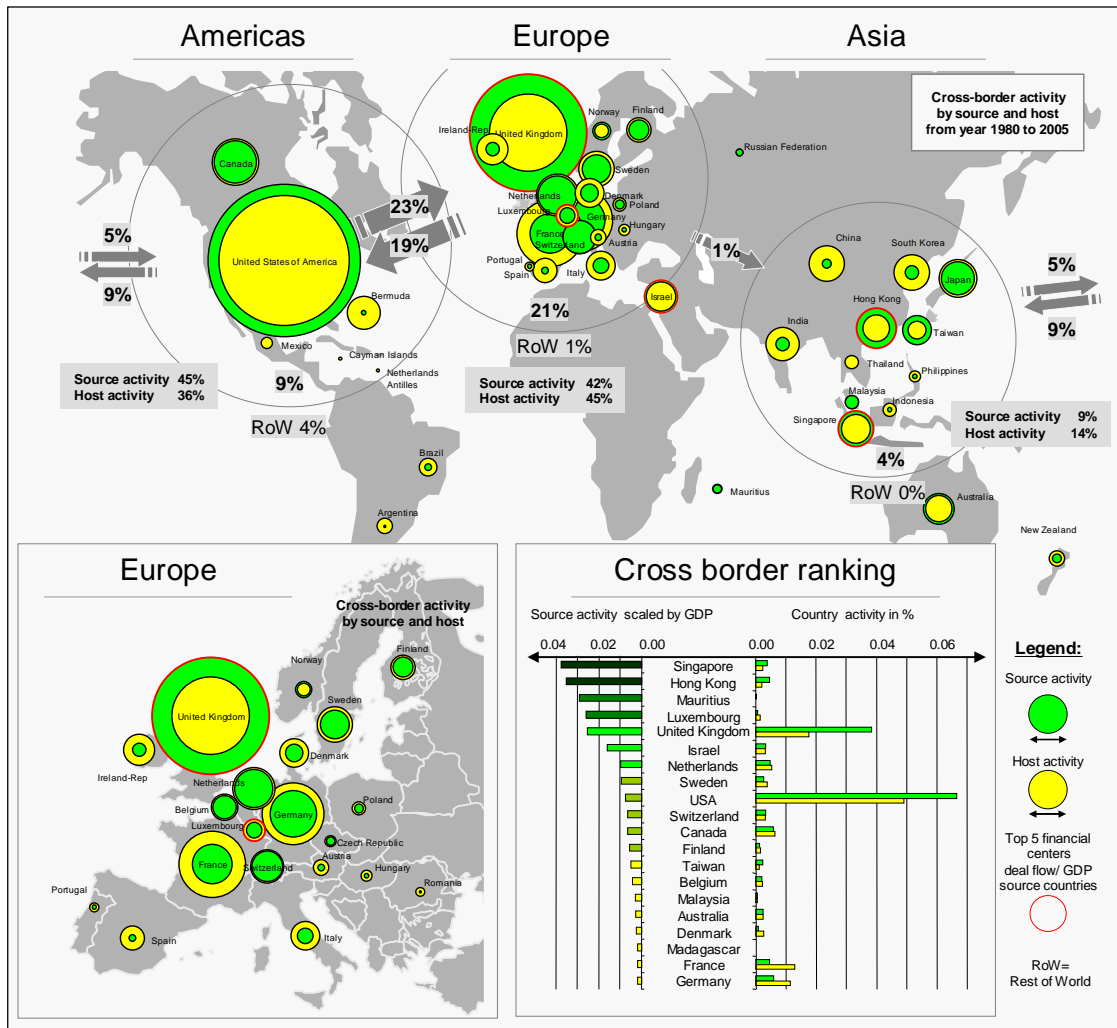
The maps above cover three main regions — North America, Europe, and Asia — with their cumulative country deal activity: North America (10[178] countries), Europe (36[179] countries), Asia (16[180]countries), and the rest of the world (36[181]

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[178] Bermuda, Canada, Cayman Islands, Costa Rica, Dominica, El Salvador, Mexico, Netherlands Antilles, Nicaragua, United States of America.

[179] Austria, Belgium, Bosnia, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania,

(cont)

countries). North America, principally the US and Canada, accounts for 45% of global source activity and 36% of host activity. Europe, with three large countries (the UK, Germany, and France) and two large PE financial centers (the UK and Luxembourg) accounts for 42% of global source activity and 46% of global host activity. Asia (principally Japan, China, India, and Taiwan, with the financial centers Singapore and Hong Kong) accounts for 9% of source activity and 14% of host activity. Analysis of the interaction of countries in a region demonstrates a difference in global distribution of trade between and within regions. Europe has the largest intracontinental investment with 21% of global source activity. North America is responsible for 9% and Asia for 4%. The largest interaction among continents occurs between North America and Europe in both directions, with deal flow from North America to Europe at 23% activity and Europe to North America at 19%. Europe's focus is on North America and on intracontinental deals; investments into Asia and the rest of the world account for only 1% each. North America and Asia are more connected, with relatively large trades from North America to Asia at 9% and Asia to North America at 5%. North America invests 4% into the rest of the world and Asia invests 0%. Investment viewed on a continental scale is highly concentrated in Europe, especially for global host activity.

Luxembourg, Macedonia, Moldova, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom.

[180] Bangladesh, China, Hong Kong, India, Indonesia, Japan, Kazakhstan, Malaysia, Philippines, Russian Federation, Singapore, South Korea, Sri Lanka, Taiwan, Thailand, Vietnam.

[181] Algeria, Argentina, Australia, Azerbaijan, Bolivia, Brazil, British Virgin Islands, Cameroon, Chile, Colombia, Ecuador, Egypt, Fiji, French Polynesia, Ghana, Israel, Jordan, Kenya, Kuwait, Madagascar, Mauritius, Morocco, Mozambique, New Zealand, Nigeria, Pakistan, Peru, Senegal, Sierra Leone, South Africa, Tanzania, Tunisia, Uganda, United Arab Emirates, Venezuela, Zambia.

4. Explicative analysis — the gravity model analysis over time

The gravity-model analysis identifies determinants that drive cross-border PE activity, and further explains the nature of the affinity of countries participating in cross-border deals. The first analyses verify the main and interaction effects of source, host, and year of the three-dimensional gravity model with an analysis of variance (ANOVA). The final gravity model analysis uses explanatory variables of gravity indicators, banking system and endowment variables, and institutional, legal, and political variables to illuminate activity (including VC and PE).

4.1. Configuration of statistical analysis

This chapter examines the empirical data to meet the requirements of the specific empirical regression analysis of this paper. The theory of the gravity-model analysis (Chapter B.2.2.2.) results in two essential regression equations for the analysis of cross-border PE activity.

1. The gravity-model equation for the analyses of variance (ANOVA) is the ordinary least squares (OLS) regression with dummy variables for the main effects of source, host, and year, and the interaction effects of source / host, source / year, and host / year.

Equation 16: The OLS regression with dummy variables for main and interaction effects

$$y_{ijt} = d_{i-1} + d_{j-1} + d_{t-1} + d_{ij-1} + d_{it-1} + d_{jt-1} + \varepsilon_{ijt} \qquad i, j = 1,...,N, \quad i \neq j, \qquad t = 1,...,T$$

2. The equation for the gravity model with explanatory variables is the OLS regression with multidimensional determinants and time dummy variables.

Equation 17: The OLS regression as gravity model with time dummies

$$y_{ijt} = \beta_0 + \beta_1 x_{ijt} + \beta_2 x_{it} + \beta_3 x_{jt} + \beta_4 x_{ij} + \beta_5 x_i + \beta_6 x_i...d_{t-1} + \varepsilon_{ijt} \qquad i, j = 1,...,N, \quad i \neq j, \qquad t = 1,...,T$$

The basic data sets for empirical analysis are described in detail for overall, VC, and PE investment followed by the explanatory dataset with indicator orientation and data transformation. The diagnostics focus on the screening of influential data, normality assumption of residuals for hypothesis testing, normality testing of dependent and independent variables, a heteroscedasticity test of residuals, and the correlation of dependent variables. Required data transformation is performed in each diagnostic step.

4.1.1. Dataset for statistical analysis

The empirical analysis uses the optimized dataset with the selection of most important countries (Chapter C.2.2.2.) aligned and adjusted to the independent variables (Chapter B.3.2.3.1.), further broken down into VC and PE investment.

The optimized dataset covers the years 1990 through 2005 for 38[182] countries out of the top 43 (excluding Taiwan, Bermuda, Luxembourg, Indonesia, and the Philippines).

The cross-border dataset contains information from **22,591** deals between funds and PF companies, and **21,260** deals between PE investors and PF companies. The dataset lists **2,363** different PE firms, **4,188** different funds, and **9,109** different PF companies. The set includes **38** source countries, **38** host countries, considered in a time series of **16** years. The panel dataset (country / year combination) has **399** different observations for source country and **475** observations for host country. The gravity-model dataset has **453** different cross-border pairs and the final analysis spans a matrix of **2,266** source, host, and year combinations. The dataset is unbalanced and includes four dependent variables: participation, deal participation, deal flow, and the normative summarizing variable activity expressed as a percentage. The absolute numbers for the variables of activity are: participation, **21,260**; deal participation: **11,584**; deal flow: **$141.43 billion**; and activity **14.5%**.

Distribution into VC and PE requires sub-datasets. These are:

Venture capital: The cross-border dataset gathers information from **16,782** deals between funds and PF companies, and **15,906** deals between PE firms and PF companies. It contains **1,908** different PE firms, **3,130** different funds, and **7,252** different PF companies. The set includes as cross-sections **38** source countries and **38** host countries, and covers 16 years. The panel dataset for source countries includes **381** observations, and for host countries **455** observations. The gravity-model dataset has **420** different cross-border pairs and

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[182] Argentina, Australia, Austria, Belgium, Brazil, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Ireland, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Thailand, United Kingdom, United States of America.

spans a matrix of **2,012** examples: participation, **15,748;** deal participation, **8,481**; deal flow, **$99.37 billion** and portion of total activity, **10.4%.**

Private equity: The cross-border dataset contains **5,809** deals between funds and PF companies, and **5,678** deals between PE firms and PF companies; listed are **762** different PE firms, **1,058** different funds, and **3,505** different PF companies. The set includes as cross-sections **34**[183] source countries and **38** host countries over 16 years. The panel dataset has **266** observations for source countries and **397** observations for host countries. The gravity model dataset has **278** different cross-border pairs and spans a matrix of **1,167,** with participation, **5,512**; deal participation, **3,103**; deal flow, **$42.06 billion**; and activity, **4.1%.**

The different datasets of overall deals, and VC and PE in combination with the four different measurable variables, require 16 different analytical set-ups for dependent variables as illustrated below:

Table 19: Matrix overview of dependent variables

	1. Participation	2.Deal participation	3. Deal flow	4. Activity
1. Deals total	1.1	2.1	3.1	4.1
2. Venture Capital	1.2	2.2	3.2	4.2
3. Private Equity	1.3	2.3	3.3	4.3

Each analysis is further broken down into four successive areas: gravity indicators, banking system, country endowment, and institutional / legal / political indicators, which are listed in detail in the following table, with variable transformation, source and host country, dimension, and time period.

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[183]   Mexico, Romania, South Africa, and Thailand are not source countries for PE investment.

Table 20: Overview of explanatory variables with transformation and indication

Model	Transf.	Indication		Measurement		Period
A) Gravity model indicators		**Source**	**Host**	**Level**	**Dimension**	
1) Economic mass related data:		(+)	(+)			
GDP	log	(+)	(+)	ratio	continuous	1990-2005
Population	log	(+)	(+)	ratio	continuous	1990-2005
2) Economic distance related variables:			(-)			
Distance	log		(-)	ratio	continuous	Static
Factors affecting the economic distance:						
Common language			(+)	nominal	binary	Static
Common border			(+)	nominal	binary	Static
Common history			(+)	nominal	binary	Static
Common currency			(+)	nominal	binary	Static
Common legal system			(+)	nominal	binary	Static
3) Country specific development related data						
Exchanger rates		(+)	(-)	ratio	index	1990-2005
Openness of im- and exports to GDP		(+)	(+)	ratio	ratio	1990-2005
Development		(+)	(+)	ordinal	rank	1990-2005
B) Private Equity related indicators		**Source**	**Host**	**Level**	**Dimension**	
1) Banking system						
1.1 Size		(+)	(+)			
M2 to GDP		(+)	(+)	ratio	ratio	1990-2005
Private credit to GDP		(+)	(+)	ratio	ratio	1990-2005
1.2 Efficiency		(+)	(+)			
Return on assets		(+)	(+)	ratio	ratio	1990-2005
Operating costs to total assets		(-)	(-)	ratio	ratio	1990-2005
Net interest margin		(+)	(+)	ratio	ratio	1990-2005
1.3 Competitiveness		(+)	(+)			
Lending minus deposit interest rate spread		(+)	(+)	ratio	ratio	1990-2005
Number of banks per GDP		(+)	(+)	ratio	ratio	1990-2005
2) Endowment-related variables						
2.1 Scientific competitiveness		(+)	(+)			
Engineers and scientists per thousand		(+)	(+)	ratio	ratio	1990-2005
Patents residential	log	(+)	(+)	ratio	continuous	1990-2005
Patents non residential	log	(-)	(-)	ratio	continuous	1990-2005
2.2 Corporate economic conditions		(+)	(+)			
GDP per capita	log	(+)	(+)	ratio	ratio	1990-2005
Wages in countries	log	(+)	(+)	ratio	continuous	1990-2005
Corporate tax rates		(-)	(-)	ratio	ratio	1990-2005
2.3 Exit possibilities		(+)	(+)			
Stock market capitalization	log	(+)	(+)	ratio	continuous	1990-2005
3) Institutional/ legal/ political						
3.1 Institutional stability and quality		(+)	(+)			
Rule of law		(+)	(+)	interval	score	1990-2005
Political stability		(+)	(+)	interval	score	1990-2005
Regulatory quality		(+)	(+)	interval	score	1990-2005
Control of corruption		(+)	(+)	interval	score	1990-2005
3.2 Legal regimes and origin						
Common law				nominal	binary	Static
Civil law				nominal	binary	Static
Other				nominal	binary	Static
3.3 Freedom		(+)	(+)			
Political rights		(+)	(+)	ordinal	rank	1990-2005
Civil rights		(+)	(+)	ordinal	rank	1990-2005
Economic freedom		(+)	(+)	interval	score	1990-2005

The table above displays the explanatory variables with the indication of impact on PE cross-border activity as formulated in the hypotheses of Chapter B.2.3.2. The results are described in detail in the following section.

4.1.2. Data diagnostics for statistical analysis

The data analysis, especially to perform the gravity model analysis, requires some fundamental assumptions of linear regression. To use the model, regression diagnostics focus on screening influential data, normality testing of the residuals, and the test of heteroscedasticity (Chapter B.2.2.).[184] Diagnostics are required for each of the 16 regressions listed in the matrix and further for the VC and PE datasets.

Screening of influential data

The screening of influential data identifies single observations that are substantially different from all other observations and that manipulate the regression analysis. The focus is the test for outliers and leverage of the variables. Outliers are observations with large residuals. Leverage is an extreme value of the explanatory variable.[185] Outliers are examined with studentized residuals with a value larger than ± 3.5.[186] A critical value of the leverage is larger than $(2k + 2) / n$.[187] The data in the sample correspond to the data derivation, and all observations are included.

The normality assumption of residuals for hypothesis testing

The OLS regression requires that residuals are identically and independently distributed. Normality of residuals is required for constructing statistics for valid hypothesis testing.[188] The normality assumption assures that the p-values for the t-tests and F-tests are valid. Numerical tests[189] determine if the residuals are normally distributed and plots help visualize the distribution of the residuals. The distribution of residuals is tested with D'Agostino's K-squared test based on the

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[184] **Greene,** Econometric Analysis; **Cook, R. D. and Weisberg, S.,** Residuals and Influence in Regression, *Monographs on statistics and applied probability*, 1982, pp. 230-235; **UCLA,** Regression Diagnostics, 2008, www.ats.ucla.edu/stat/stata/webbooks/reg/chapter2/statareg2.htm.

[185] **UCLA,** Regression Diagnostics.

[186] Different critical values are mentioned in literature, compare: **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects; **UCLA,** Regression Diagnostics.

[187] **k** is the number of predictors and **n** is the number of observations: **UCLA,** Regression Diagnostics.

[188] **Greene,** Econometric Analysis, pp. 17, 50 and 90.

[189] Common tests for normality are: Shapiro-Wilk and Shapiro-Francia tests for normality, but the tests have limitations in the number of observations.

combination of the tests for skewness and kurtosis.[190] The following graphs plot the residual distribution of the dependent variable deal flow against a normal probability curve in a histogram and a kernel density plot.

Figure 30: Normality distribution of residuals (deal flow)
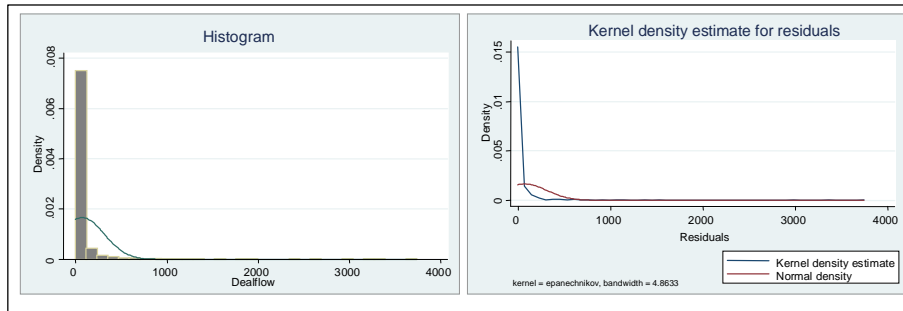
The plots clearly indicate that the residuals are not normally distributed and the normality test verifies the result with a skewness of 0.000, a kurtosis of 0.000, and a chi square of (.), rejecting the null hypothesis of normality.[191]

Normality of dependent and independent variables

A common cause of non-normally distributed residuals are non-normally distributed dependent or explanatory variables. A transformation of the variables helps to distribute the residuals more normally. The original econometric representation of the gravity model takes the form of a triple-indexed model with log-log transformation to fulfill the requirements of normality with the following equation:[192]

Equation 18: Econometric representation of the gravity-model equation

$$\ln y_{ijt} = \beta_0 + \beta_1 \ln x_{ijt} + \beta_2 \ln x_{it} + \beta_3 \ln x_{jt} + \beta_4 \ln x_{ij} + \beta_5 \ln x_i + \beta_6 \ln x_i + \varepsilon_{ijt}$$

with: $\qquad i, j = 1,...,N, \quad i \neq j, \qquad t = 1,...,T$

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[190] **D'Agostino, R. B.; Balanger, A. and R. B. D'Agostino, J.,** A Suggestion for Using Powerful and Informative Tests of Normality, *American Statistician*, 1990, *44*, pp. 316-321.

[191] **UCLA,** Simple and Multiple Regression, 2008, www.ats.ucla.edu/stat/Stata/webbooks/reg/chapter1/statareg1.htm.

[192] **Matyas,** Proper Econometric Specification of the Gravity Model; **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects.

Log-log refers to the transformation of the dependent and the explanatory variables by natural logarithm. The equation as it stands does not consider specific variable types to be transformed. Different adjustments to the equations are considered in literature without a definite method of variable transformation.[193]

To obtain normality for empirical analysis, dependent and independent variables are converted, with potential transformations of log, square root, or raising the variable to a power, etc.,[194] and the residuals are tested for normal distribution with the skewness / kurtosis test.[195] The result is shown for the dependent variable deal flow.

Figure 31: Checking for normality of residuals for deal flow model after transformation
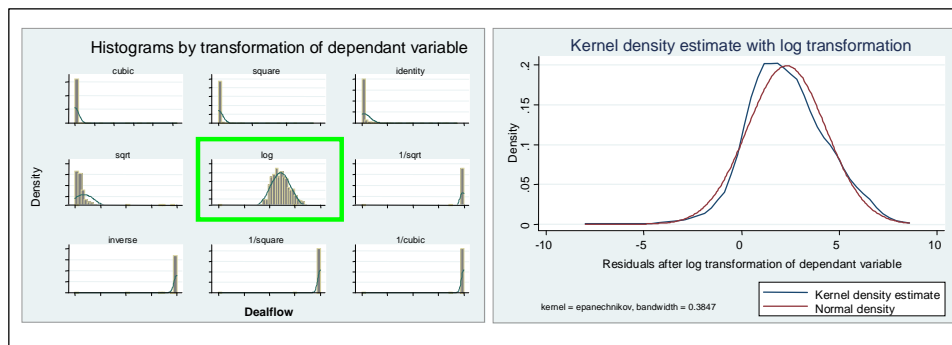
The histogram and kernel density graph verify the log transformation of the dependent variable as a best fit for normality of residual distribution. The test supports selection of the log transformation with a chi-square = 17.42 and a P (chi-squared) for log (deal flow) = 0.000 having the smallest chi-square of all the transformation possibilities.

Transformation of data in detail: Analyzing the variables for normality and aligning the transformations with the gravity model set up in literature,[196] the

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[193] **Borrmann; Jungnickel and Keller,** What Gravity Models Can Tell Us About the Position of German FDI in Central and Eastern Europe; **Rose and Spiegel,** Offshore Financial Centers: Parasites or Symbionts?

[194] Cubic, square, identity, square root, log, 1 / (square root), inverse, 1 / square, 1 / cubic. **UCLA,** Simple and Multiple Regression.

[195] Using D'Agostino's K-squared test.

[196] **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects; **Borrmann; Jungnickel and**

(cont)

transformations are essentially applied to variables with a ratio scale of measurement and not to quotients of numerical data. The transformed variables are the dependent variables: participation, deal participation, deal flow, and the activity percentage. The transformed independent variables of the gravity model indicators of economic mass are GDP, population, and the geographic distance in nautical miles. The transformed independent variables of PE are the endowment indicators: patents residential and nonresidential, GDP per capita,[197] wages in a country, and stock market capitalization.

Including the variables of population, GDP, and GDP per capita in the equation with log transformation results in perfect colinearity of the three variables. To avoid the problem of perfect colinearity, the variable GDP is excluded and GDP per capita is understood as a measurement of economic mass and an endowment indicator, and will be included in the analysis as representative of both categories.[198]

The variables with nominal, ordinal, and interval scale — like the economic distance indicators of common language, common border, etc., and the institutional, legal, and political indicators — are not transformed due to their level of measurement. The remaining ratio variables, like the banking sector indicators, are unchanged because they are either scaled by a variable accounting for country size, like GDP, or they are country size indifferent, like lending minus deposit interest rate spread. The final variable set with transformations is listed in Table 20 above.

Keller, What Gravity Models Can Tell Us About the Position of German FDI in Central and Eastern Europe, p. 7; **Greene; Harris and Matyas,** Gravity Models, Zero Trade Flows and Fixed Effects, p. 4; **Matyas,** Proper Econometric Specification of the Gravity Model.

[197] Including GDP per capita requires some adjustments due to colinearity if the indicators GDP and population are included in the regression analysis. GDP per capita is used as an economic mass indicator in several studies with transformation: **Rose and Spiegel,** Offshore Financial Centers: Parasites or Symbionts?

[198] Different variable combinations are used with the gravity model to avoid the problem of colinearity.

Heteroscedasticity test of residuals

The inconsistency in the regression disturbance of the variances across the observations is tested with the Breusch-Pagan[199] test for heteroscedasticity. Testing the null hypothesis — that the variance of the residuals is homogeneous — provides evidence that heteroscedasticity is an obvious problem and a robust correction is in place. The regressions are corrected using White's correction for robust standard errors.[200] For this analysis, all equations are estimated with ordinary least squares, using the robust estimator to handle heteroscedasticity.

Correlation of dependent variables

The four dependent variables account for diverse facets of cross-border deal structure. The correlation tests the coherence of each variable, especially the calculated abstract variable of activity as a percentage correlated to the observable and quantifiable variables participation, deal participation, and deal flow. The correlation is calculated for the basic variable and the transformed variable, illustrated in the following table for overall activity, including VC and PE.

Table 21: Correlation of dependent variables for overall deals

Correlation of dependant variables for overall deals			Number of observations: 1968	
No tranformation	Particiaption	Deal participation	Dealflow	Activity %
Particiaption	1			
Deal participation	**0.96**	1		
Dealflow	0.76	0.77	1	
Activity %	0.91	0.92	**0.96**	1
Log transformation	Particiaption	Deal participation	Dealflow	Activity %
Particiaption	1			
Deal participation	**0.92**	1		
Dealflow	0.72	0.66	1	
Activity %	**0.92**	0.91	0.86	1

The largest correlation of untransformed variables is between participation and deal participation, and the second largest is between deal flow and activity as a percentage due to the variable generation. Deal flow and participation are less correlated due to the growing average of deal flow and the shift of country activity from VC to PE over the years. The largest correlation of the transformed variables is between participation and deal participation, participation and activity

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[199] Breusch-Pagan / Cook-Weisberg test; see stata hettest default; **Stata Corporation.,** Longitudinal/Panel data; **Greene,** Econometric Analysis.

[200] **Greene,** Econometric Analysis, p. 199; **UCLA,** Regression Diagnostics.

as a percentage. Varying results can be expected due to the different correlations of the variables.

The diagnostics with data transformation ensure reliable datasets of dependent and independent variables for empirical analysis.

4.2.   Analysis of main and interaction effects for countries over time

The analysis of main and interaction effects verifies the effect captured in the three main dimensions — source, host, and year — and the effects inherent in the particular constellation of source / host, source / year, and host / year.[201] The gravity-model equation for both main and interaction effects, as derived in Chapter B.2.2.2. with dummy variables, is stated as follows:

Equation 19: Gravity equation with dummy variables

$$\ln y_{ijt} = d_{i-1} + d_{j-1} + d_{t-1} + d_{ij-1} + d_{it-1} + d_{jt-1} + \varepsilon_{ijt} \qquad i, j = 1,...,N, \quad i \neq j, \qquad t = 1,...,T$$

The verification of the main and interaction effects of source, host, and year is accomplished by the analysis of variance (ANOVA)[202] for each category. ANOVA allows a breakdown of the variance into components of the main and interaction effect. Analysis is performed for all dependent variables and for all company investment stages; each effect is analyzed separately, resulting in 72 calculations.[203] The following chapters detail the calculation steps for overall investment. The results for VC and PE are listed in a summary table.

4.2.1. ANOVA for overall cross-border deals

The first analysis of variance investigates the main effects of source, host, and year for the variable deal flow with the following results:

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[201] **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects.

[202] **Greene,** Econometric Analysis, p. 33; ANOVA can be used to produce regression estimates and the ANOVA output; **Egger and Pfaffermayr,** The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects, p. 575.

[203] 4 dependent variable x 3 investment stages x 6 ANOVA (3 for main effects, 3 interaction effects). The effects are estimated separately due to matrix size of interaction variables: source / host exceeds the maximum possible matrix size of the analysis program.

Table 22: Analysis of variance of deal flow with main effects

Analysis of Variance of deal flow with main effects						
ANOVA Dealflow	Number of obs: Root MSE:	1968 1.55298		R-squared: Adj R-squared:		0.4287 0.4019
Source	**Partial SS**	**% of total**	**df**	**MS**	**F**	**Prob > F**
Model	3400.3842	42.9%	88	38.6407	16.02	0.0000
Year	1237.0990	15.6%	15	82.4733	34.20	0.0000
Source	2464.2002	**31.1%**	36	68.4500	28.38	0.0000
Host	1357.0484	17.1%	37	36.6770	15.21	0.0000
Residual	4531.6453	57.1%	1879	2.4117		
Total	7932.0295	100.0%	1967	4.0326		

The R-squared of 42% shows that the model explains approximately 42% of the data variation. The main effects — source, host, and year — are all significant with F<0.05. The source country effect is by far the largest main effect, with 31.1%, followed by host country, with 17.1%, and year, with 15.6% of variance. The results indicate that the determinants inherent in the source country affect cross-border investment activity most, followed by host country and year-inherent determinants.

The next table presents the consolidated results of ANOVA with the three separately analyzed main effects and the three separately analyzed interaction effects:

Table 23: Consolidated results of ANOVA with main and interaction effects for deal flow

Consolidated ANOVA tables of models with one effect						
ANOVA	Deal flow			Number of obs:		1968
Source	**Partial SS**	**% of total**	**df**	**MS**	**F**	**Prob > F**
Total	7932.02953	100.0%	1967	4.0326		
Year	419.8506	5.3%	15	27.9900	7.27	0.0000
Source	1274.3920	16.1%	36	35.3998	10.27	0.0000
Host	438.4014	5.5%	37	11.8487	3.05	0.0000
Year*Source	2741.1682	34.6%	370	7.4086	2.28	0.0000
Year*Host	2127.3350	26.8%	440	4.8349	1.27	0.0006
Source*Host	3505.0077	44.2%	414	8.4662	2.97	0.0000

The analysis verifies that the largest part of cross-border investment is explained by the interaction effects and not the main effects. The largest effect is inherent in the country pair combination, expressed in the source / host interaction effect with 44.2%, followed by the source / year effect with 34.6%, and the host / year effect of 26.8%. The main effects verify the same relative importance as in the

model, with all main effects included. The results prove the strong explanatory power inherent in the country pair. To compare the main and interaction effects for the dependent variable, the consolidated results of ANOVA performed for all four dependent variables are summarized in Table 24 below. The number of observations for participation, deal participation, and the activity percentage is **2,266**, and for deal flow, **1,968**. The R-squared of each model is the individual effect for each category, since this is the only effect controlled for by the dummy variable. Each table displays the partial sum of squares (Partial SS), the partial sum of squares as a percentage, the F-statistic and the probability (Prob > F). The first subtable contains the results of the previous consolidated deal flow analysis. The largest effects overall are bolded.

Table 24: Consolidated results of ANOVA with main and interaction effects

Consolidated ANOVA tables with models with one source								**Overall investements**
ANOVA	**Deal flow**		Obs:	1968	**ANOVA**	**Participation**	Obs:	2266
Source	**Partial SS**	**% of total**	**F**	**Prob > F**	**Source**	**Partial SS**	**% of total F**	**Prob > F**
Total	7932.0295	100.00%			Total	3530.5387	100.00%	
Year	419.8506	5.29%	7.27	0.0000	Year	83.2365	2.36%	3.62	0.0000
Source	1274.3920	**16.07%**	10.27	0.0000	Source	470.0724	13.31%	9.25	0.0000
Host	438.4014	5.53%	3.05	0.0000	Host	523.3176	**14.82%**	10.48	0.0000
Year*Source	2741.1682	34.56%	2.28	0.0000	Year*Source	912.6388	25.85%	1.64	0.0000
Year*Host	2127.3350	26.82%	1.27	0.0006	Year*Host	914.8792	25.91%	1.32	0.0000
Source*Host	3505.0077	**44.19%**	2.97	0.0000	Source*Host	2134.8717	**60.47%**	6.14	0.0000
ANOVA	**Deal participation**		Obs:	2266	**ANOVA**	**Activity**	Obs:	2266
Source	**Partial SS**	**% of total**	**F**	**Prob > F**	**Source**	**Partial SS**	**% of total F**	**Prob > F**
Total	4040.8082	100.00%			Total	4324.7794	107.03%	
Year	42.4441	1.05%	1.59	**0.0681**	Year	104.6269	2.59%	3.72	0.0000
Source	720.1479	**17.82%**	13.06	0.0000	Source	756.2379	**18.72%**	12.76	0.0000
Host	260.7237	6.45%	4.15	0.0000	Host	362.0694	8.96%	5.5	0.0000
Year*Source	1225.5476	30.33%	2.04	0.0000	Year*Source	1320.8141	32.69%	2.06	0.0000
Year*Host	746.7416	18.48%	0.86	**0.9809**	Year*Host	908.1724	22.48%	1	**0.4706**
Source*Host	2413.3941	**59.73%**	5.95	0.0000	Source*Host	2448.3407	**60.59%**	5.23	0.0000

The results are interpreted separately for each dependent variable and in comparison to the four dependent variables.

Participation: The largest main effect for participation is the host country effect, with 14.82%, which is different from the deal-flow analysis. The largest interaction effect is the source / host effect, with 60.47%, validating the relevance of the country pair combination. The second-largest effect is the year / host effect, with 25.91%, almost identical with the year / source effect, with 25.85%, which is also different compared to the deal-flow analysis. The effect of year accounts only for 2.36%.

Deal-participation: The largest main effect in this analysis is by far the source country effect, with 17.82%; the host country effect has only 6.45%, and the year effect is not significant (p-value = 0.0681). The source / host interaction is the dominant effect, with 59.73%, followed by the year / source effect, with 30.33%, whereas the year / host effect is not significant.

Activity percent: The largest main effect is the source country effect, with 18.72%, followed by the host effect, with 8.96%, and the year effect, with 2.59%. The largest interaction effect is source / host, with 60.59%, followed by year / source, with 32.69%. The variable year / host is not significant. Comparison of the ANOVA results reveals a variation in the main and interaction effects for each of the four dependent variables, with different absolute explanatory values. Further, the ratio of effects varies for each of the dependent variables. The source / host combination explains the largest portion of cross-border activity. The results for year / source and year / host vary in the analyses of the dependent variables, caused by the result of participation with host country effects larger than source country effects.

Comparing the ratio of main effects between the deal flow and participation analysis, in the deal-flow analysis, source is the largest main effect, and the effects of year and host are almost similar in proportion. In contrast, in the participation analysis, the largest main effects are source and host with similar values.

Comparing the interaction effects for deal flow and participation, the year / source effect is significantly larger in the deal-flow analysis, whereas the year / source and year / host effects are nearly similar in the participation analysis.

The comparison of the deal-participation analyses to the activity-percentage analyses yields similar effect ratios, although on a higher level for the activity percentage.

The results prove that it is not sufficient to investigate isolated countries to explain PE activity. It is indispensable to explain cross-border activity with country pairs in a system of entities with reactive relationships over time.

Further, analysis of the four dependent variables supports the fact that it can be misleading to observe general activity by measuring deal flow only.

4.2.2. ANOVA applied to venture capital and private equity

ANOVA is applied to the finance stages of VC and PE investments to investigate if country affinity varies between overall, VC, and PE investments. The results for the four dependent variables are presented in the consolidated tables.

4.2.2.1.   Venture capital

The ANOVA of VC cross-border investment focuses on the early stages of a company, investigating the impact of the main and interaction effects. The number of observations for deal flow is **1,744**, and for participation, deal participation, and activity percentage, **2,012**.

Table 25: Consolidated results of ANOVA with main and interaction effects (VC)

Consolidated ANOVA tables with models with one source									**Venture Capital**
ANOVA	**Deal flow**		Obs:	1744	**ANOVA**	**Participation**		Obs:	2012
Source	**Partial SS**	**% of total**	**F**	**Prob > F**	**Source**	**Partial SS**	**% of total**	**F**	**Prob > F**
Total	6606.0481	100.00%			Total	2864.3509	100.00%		
Year	326.5909	4.94%	5.99	0.0000	**Year**	50.9168	1.78%	2.41	0.0018
Source	962.0351	**14.56%**	8.08	0.0000	**Source**	309.7270	10.81%	6.47	0.0000
Host	425.0866	6.43%	3.26	0.0000	**Host**	449.3157	**15.69%**	9.93	0.0000
Year* Source	2206.2515	33.40%	1.93	0.0000	**Year* Source**	660.9710	23.08%	1.29	0.0006
Year*Host	1902.9870	28.81%	1.26	0.0013	**Year*Host**	767.2393	26.79%	1.25	0.0010
Source*Host	2944.8870	**44.58%**	2.86	0.0000	**Source*Host**	1701.8446	**59.41%**	5.56	0.0000
ANOVA	**Deal participation**		Obs:	2012	**ANOVA**	**Activity**		Obs:	2012
Source	**Partial SS**	**% of total**	**F**	**Prob > F**	**Source**	**Partial SS**	**% of total**	**F**	**Prob > F**
Total	3374.7679	100.00%			Total	3549.1210	105.17%		
Year	29.5814	0.88%	1.18	**0.2826**	**Year**	69.8299	2.07%	2.67	0.0005
Source	541.6450	**16.05%**	10.2	0.0000	**Source**	526.6906	**15.61%**	9.3	0.0000
Host	204.9636	6.07%	3.45	0.0000	**Host**	312.1674	9.25%	5.15	0.0000
Year* Source	992.0067	29.39%	1.79	0.0000	**Year* Source**	995.4816	29.50%	1.67	0.0000
Year*Host	618.7516	18.33%	0.77	**0.9996**	**Year*Host**	766.8292	22.72%	0.95	**0.7670**
Source*Host	1941.1011	**57.52%**	5.14	0.0000	**Source*Host**	1956.5167	**57.97%**	4.67	0.0000

The results show the same pattern of main and interaction effects as in overall investment, although on a lower level of variance. The largest effect of the four analyses is the source / host effect, with 59.41% for participation. The ratios vary compared to overall investment, especially for participation. The host effect is significantly larger than the source effect and the interaction effect of year / host larger than year / source. The ANOVA for VC investment verifies the large impact of the source / host effect and identifies a shift in ratio toward host country effects, indicating that the destination country for early stage cross-border investment is more important.

4.2.2.2.   Private equity

The ANOVA for PE investment investigates the difference in buyouts and later-stage investment compared to overall investment. The number of observations for deal flow is **944** and for participation, deal participation, and activity percentage, **1,167**.

Table 26: Consolidated results of ANOVA with main and interaction effects (PE)

Consolidated ANOVA tables with models with one source										**Private Equity**
ANOVA	**Deal flow**		Obs:	992		**ANOVA**	**Participation**		Obs:	1167
Source	**Partial SS**	**% of total**	**F**	**Prob > F**		**Source**	**Partial SS**	**% of total**	**F**	**Prob > F**
Total	3767.8930	100.00%				Total	1213.4517	100.00%		
Year	234.7976	6.23%	4.32	0.0000		Year	26.6531	2.20%	1.72	0.0412
Source	547.5399	**14.53%**	5.1	0.0000		Source	137.1030	11.30%	4.37	0.0000
Host	197.1088	5.23%	1.42	**0.0500**		Host	211.4063	**17.42%**	6.44	0.0000
Year* Source	1299.4979	34.49%	1.66	0.0000		Year* Source	300.7619	24.79%	1.12	**0.1191**
Year*Host	1316.1563	34.93%	1	**0.5119**		Year*Host	401.2810	33.07%	0.96	**0.6728**
Source*Host	1527.4550	**40.54%**	2.08	0.0000		Source*Host	715.5841	**58.97%**	4.61	0.0000
ANOVA	**Deal participation**		Obs:	1167		**ANOVA**	**Activity**		Obs:	1167
Source	**Partial SS**	**% of total**	**F**	**Prob > F**		**Source**	**Partial SS**	**% of total**	**F**	**Prob > F**
Total	1472.9833	100.00%				Total	1652.234	112.17%		
Year	16.2998	1.11%	0.86	**0.6116**		Year	33.013	2.24%	1.56	**0.0768**
Source	205.8984	**13.98%**	5.58	0.0000		Source	250.099	**16.98%**	6.12	0.0000
Host	120.5076	8.18%	2.72	0.0000		Host	157.610	10.70%	3.22	0.0000
Year* Source	423.8019	28.77%	1.37	0.0005		Year* Source	449.571	30.52%	1.27	0.0063
Year*Host	374.0300	25.39%	0.66	**1.0000**		Year*Host	482.352	**32.75%**	0.8	**0.9935**
Source*Host	825.9162	**56.07%**	4.1	0.0000		Source*Host	871.228	**59.15%**	3.58	0.0000

The analyses yield similar distributed results of the main and interaction effects, although with a significant shift toward host effect, especially for participation and deal participation. The largest effect is the source / host effect, with 59.15% for the activity percentage. Compared to the previous ANOVAs, the main effect of years in the deal-flow analysis is larger than the host effect. Although the host country effect is very important, neither of the year / host interaction effects is significant in the PE activity analyses.

4.2.3. Intermediate results of empirical analysis

Essential is the verification of the strong impact of country affinity expressed through the large interaction effect of the source / host pair. It underscores the importance of positive country relations for cross-border investment. Further, ANOVA identifies the large impact of the source country effect for deal flow, deal participation, and activity percentage. It verifies the focus on the source country

perspective, as done in the descriptive analysis, with the source perspective of the graphic panel analysis and the scaling of countries by GDP of the source country. Only for participation is the host country effect larger. The year effect is less important for cross-border activity.

The breakdown into VC and PE financing confirms a shift toward the impact of the host country compared to overall investment. The results of ANOVA support the necessity of the gravity model analysis with differentiation into the four dependent variables to capture cross-border PE activity in detail.

4.3.   The gravity model analysis with explanatory indicators

The gravity model analysis with explanatory variables identifies determinants that explain PE cross-border activity. The analysis investigates especially the impact of country affinity with the gravity indicators — mass and economic distance, and the PE indicators — banking system, country endowment, and institutional, legal, and political environments. The models diversify into the four dependent variables. The analysis is further broken down into VC and PE activity. The analytic steps are detailed for overall investment, with gravity indicators discussed first, followed by the other sets of explanatory variables. Results of the VC and PE analyses are disclosed for the gravity indicators and the full set of determinants without presenting the intermediate steps of category analysis. The final analyses compare the results for overall, VC, and PE investment.

4.3.1. Analysis of overall private equity investment

The analysis of overall PE investment explains cross-border activity with detailed explanatory variables.

The equation for the gravity model with the full set of variables with log transformation and year dummy variables is:

Equation 20: Gravity model with dummy variables and log for variables

$$\ln y_{ijt} = \beta_0 + (\beta_1 \ln popul._{it} + \beta_2 \ln popul._{jt} + \beta_3 \ln dist._{ij} + \beta_4 com.language_{ij} + \beta_5 com.border_{ij} + \beta_6 com.history_{ij}$$

$$+ \beta_7 com.currency_{ij} + \beta_8 com.legal_{ij} + \beta_9 exchangerate_{it} + \beta_{10} exchangerate_{jt} + \beta_{11} openness_{it}$$

$$+ \beta_{12} openness_{jt} + \beta_{13} developm._{it} + \beta_{14} developm._{jt}) + (\beta_{15} m2_{it} + \beta_{16} m2_{jt} + \beta_{17} priv.credit_{it} + \beta_{18} priv.credit_{jt}$$

$$+ \beta_{19} return.asset_{it} + \beta_{20} return.asset_{jt} + \beta_{21} operat./asset_{it} + \beta_{22} operat./asset_{jt} + \beta_{23} net.i.mar._{it} + \beta_{24} net.i.mar_{jt}$$

$$+ \beta_{25} i.ratespread_{it} + \beta_{26} i.ratespread_{jt} + \beta_{27} nr.banks_{it} + \beta_{28} nr.banks_{jt}) + (\beta_{29} eng.scient_{it} + \beta_{30} eng.scient_{jt}$$

$$+ \beta_{31} \ln patent.res_{it} + \beta_{32} \ln patent.res_{jt} + \beta_{33} \ln patent.n.res_{it} + \beta_{34} \ln patent.n.res_{jt} + \beta_{35} \ln GDPcapita_{it}$$

$$+ \beta_{36} \ln GDPcapita_{jt} + \beta_{37} \ln wages_{it} + \beta_{38} \ln wages_{jt} + \beta_{39} taxrate_{it} + \beta_{40} taxrate_{jt} + \beta_{41} \ln stock.m.capital_{it}$$

$$+ \beta_{42} \ln stock.m.capital._{jt}) + (\beta_{43} rul.law_{it} + \beta_{44} rul.law_{jt} + \beta_{45} pol.stab_{it} + \beta_{46} pol.stab_{jt} + \beta_{47} reg.qual_{it}$$

$$+ \beta_{48} reg.qual._{jt} + \beta_{49} corrupt._{it} + \beta_{50} corrupt._{jt} + \beta_{51} com.law_i + \beta_{52} com.law_j + \beta_{53} civil.law_i + \beta_{54} civil.law_j$$

$$+ \beta_{55} pol.rights_{it} + \beta_{56} pol.rights_{jt} + \beta_{57} civ.rights_{it} + \beta_{58} civ.rights_{jt} + \beta_{59} econ.free_{ijt} + \beta_{60} econ.free_{ijt})$$

$$+ d_{1991} + ... + d_{2005} + \varepsilon_{ijt}$$

$$\text{with} \quad i, j = 1,...,N, \quad i \neq j, \quad\quad t = 1,...,T$$

The model is employed using the variables of the gravity model indicators — economic mass, economic distance, country pair-specific data, and the overall PE investment indicators — banking system, country endowment indicators and the institutional / legal / political indicators. The variables of each step are listed in the equation in parentheses. The focus of the analysis is on the indicators, whether they are statistically significant and, if so, their direction and value. The results are presented for all dependent variables in one table, including for each model the number of observations in the regression analysis, the F and Prob > F (F-value[204] and p-value[205]), the R-squared,[206] and the RootMSE[207] in the top columns. For each independent variable the coefficient, the p-value, and beta coefficient[208] are listed, whereas standard error, t- value, and the confidence interval are hidden.

The tables list the variables with their transformation into logarithms, their source (S) and host (H) abbreviation, and the expected positive (+) or negative (-) indication. The statistically significant p-values are highlighted in green for easier

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[204] F-value is the Mean Square Model divided by the Mean Square Residual, yielding in F.

[205] p-value associated with the F-value.

[206] R-squared: Proportion of variance in the dependent variable that can be predicted from the independent variable(s).

[207] RootMSE: Standard deviation of the error term and square root of the Mean Square Residual (Error).

[208] The beta coefficient is the standardized regression coefficient that compares the strength of the coefficients in standard deviations instead of the units of the variables.

identification; the coefficients of the statistically significant variables are highlighted in green if positive-related and in yellow if negative-related. The year dummy variables are not listed as results in the table.

4.3.1.1.   Estimates from the gravity-model indicators

The first analysis focuses on the gravity model-derived indicators to investigate the impact of country mass and country affinity. Indicators analyzed are economic mass, economic distance, and country pair-specific data. Variable GDP per capita is included in the gravity model indicator analysis because of its dual role as mass indicator and country endowment indicator, after excluding GDP from the analysis due to colinearity after log transformation.[209] The equation for gravity model indicators is:

Equation 21: Gravity-model equation with traditional gravity model indicators

$$
\ln y_{ijt} = \beta_0 + (\beta_1 \ln popul._{it} + \beta_2 \ln popul._{jt} + \beta_3 \ln dist._{ij} + \beta_4 com.language_{ij} + \beta_5 com.border_{ij} + \beta_6 com.history_{ij}
$$
$$
+ \beta_7 com.currency_{ij} + \beta_8 com.legal_{ij} + \beta_9 exchangerate_{it} + \beta_{10} exchangerate_{jt} + \beta_{11} openness_{it}
$$
$$
+ \beta_{12} openness_{jt} + \beta_{13} developm._{it} + \beta_{14} developm._{jt}) + (\beta_{35} \ln GDPcapita_{it} + \beta_{36} \ln GDPcapita_{jt})
$$
$$
+ d_{1991} + ... + d_{2005} + \varepsilon_{ijt}
$$

with $i, j = 1,...,N, \quad i \neq j,$ $t = 1,...,T$

The country mass and the country pair-specific variables are time-variant, whereas the economic distance variables are time-invariant. The results for the gravity model indicators are presented in the following table.

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[209] See "**Rose and Spiegel,** Offshore Financial Centers: Parasites or Symbionts?" to include GDP per capita as an economic mass indicator.

Table 27: Gravity model estimates for the gravity indicators

Gravity model analysis	log	Source Host		Participation Numberofobs=2266 F(31,2234)=42.24 Prob>F=0 R-squared=0.4106 RootMSE=0.96513			Deal participation Numberofobs=2266 F(31,2234)=29.26 Prob>F=0 R-squared=0.2924 RootMSE=1.1313			Dealflow Numberofobs=1968 F(31,1936)=24.23 Prob>F=0 R-squared=0.3164 RootMSE=1.6736			Activity % Numberofobs=2266 F(31,2234)=35.98 Prob>F=0 R-squared=0.3661 RootMSE=1.1077		
Indicators				Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
A) Gravity model indicators															
1) Economic mass			(+)												
Population	log	S	(+)	0.3763	0.000	0.455	0.3696	0.000	0.418	0.6520	0.000	0.496	0.4422	0.000	0.483
		H	(+)	0.3896	0.000	0.493	0.3350	0.000	0.396	0.5041	0.000	0.402	0.3945	0.000	0.451
2) Economic distance			(-)												
Distance	log		(-)	-0.1971	0.000	-0.187	-0.2102	0.000	-0.186	-0.3235	0.000	-0.191	-0.2543	0.000	-0.218
Factors eco. distance:			(+)												
Common language			(+)	0.6280	0.000	0.203	0.6771	0.000	0.205	0.7760	0.000	0.161	0.7254	0.000	0.212
Common border			(+)	-0.0231	0.776	-0.007	-0.0541	0.565	-0.015	-0.4187	0.011	-0.075	-0.1817	0.053	-0.048
Common history			(+)	0.2316	0.055	0.036	0.2329	0.073	0.034	0.4585	0.019	0.046	0.2959	0.026	0.042
Common currency			(+)	-0.6978	0.000	-0.120	-0.6837	0.000	-0.110	-1.0267	0.000	-0.100	-0.8067	0.000	-0.125
Common legal system			(+)	-0.1694	0.002	-0.066	-0.0908	0.164	-0.033	-0.0806	0.456	-0.019	-0.1315	0.038	-0.046
3) Country pair specific															
Exchange rates		S	(+)	-0.0018	0.425	-0.016	-0.0015	0.570	-0.013	-0.0103	0.009	-0.057	-0.0044	0.082	-0.036
		H	(-)	-0.0008	0.662	-0.008	0.0028	0.150	0.026	-0.0036	0.343	-0.021	-0.0022	0.282	-0.020
Openness of im- and exports to GDP		S	(+)	0.1491	0.000	0.090	0.0713	0.123	0.040	0.4498	0.000	0.171	0.1976	0.000	0.108
		H	(+)	0.0191	0.614	0.009	0.0987	0.024	0.044	0.1268	0.100	0.038	0.0984	0.022	0.042
Development		S	(+)	-0.0419	0.805	-0.009	-0.0246	0.909	-0.005	0.6109	0.054	0.077	-0.0020	0.992	0.000
		H	(+)	-0.0010	0.993	0.000	-0.1270	0.333	-0.036	-0.4202	0.067	-0.077	-0.1678	0.211	-0.046
2) Endowment-related variables															
GDP per capita	log	S	(+)	1.1340	0.000	0.376	1.0920	0.000	0.338	1.3713	0.000	0.277	1.2492	0.000	0.374
		H	(+)	0.9020	0.000	0.430	0.6654	0.000	0.297	1.0440	0.000	0.310	0.8535	0.000	0.368

Table 27 presents the four regression analysis results for the dependent variables, with 11 different determinants specified in source (S) and host (H). In total, 16 individual variables are analyzed, with **2,266** observations for model participation, deal participation, and activity, and **1,968** observations for the deal flow model.

The F-test (Prob > F = 0) for all four variables is statistically significant, indicating that the models themselves are statistically significant. The R-squared of 0.4106 in the model participation shows that the model explains approximately 42% of the data variation. For deal participation, R-squared is 0.2924 (29%), for deal flow, 0.3164 (32%), and for activity percentage, 0.3661 (37%). The indicators explain a considerable portion of the variation.

1) Economic mass indicator: Focusing on the economic mass indicator first, the p-value (P > |t|) for population is statistically significant for source and host country in all four models (p = 0.000),[210] indicating that the coefficients for population are significantly different from zero. The coefficients express the relationship between dependent and independent variables and the increase in PE investment by an increase of one of the independent variables. For the

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[210] The p-value is used to test the null hypothesis that the coefficient for log population is zero.

variable population of source[211] in the participation model, the coefficient is 0.3763, or approximately 0.4, expressing that, for a one-unit increase in *log population s*, an increase of 0.4 units in *log participation* is expected.[212] In detail, the coefficients for source population are between 0.3696 and 0.6520, and for host population between 0.3350 and 0.5041 for all four models. The positive sign indicates that larger population is related to higher country performance, which is expected from the gravity model theory. Differences arise in the importance of the variable by source and host within the models. The coefficient is larger for host in the participation model, but larger for source in the deal participation, deal flow, and activity percentage models. The coefficients indicate the clear impact of economic mass in general and especially of the source country for deal flow and activity percentage.

The effect of **GDP per capita** for source (between 1.0920 and 1.3713), p = 0.000) and GDP per capita for host (between 0.6654 and 1.0440, p = 0.000) are significant, and the coefficients indicate a positive relationship between PE activity and GDP per capita.[213] The coefficients support the theory that economically massive and productive countries tend to have more PE cross-border investments.

The beta coefficient indicates that the economic mass indicators — population and GDP per capita — have the largest standardized coefficient in the analysis and the largest impact in country PE activity. Overall, the mass indicators signify that the larger the size of the economy, the greater the propensity for cross-border PE activity.

2) Economic distance indicator: The elasticity of investment activity to **geographic distance** is between -0.1971 and -0.3235, increasing the likelihood of cross-border investment with lower distance. The economic distance indicator **common language** is significant for all models, and indicates a rise in cross-border investment by 0.6 to 0.8 units. A **common border** seems to be unrelated

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[211] Log transformed variable population of source country.
[212] The numeric example is: a source country with 100 million (= 10^2) of population is expected to have a log participation 0.4 units higher than a source country with 10 (= 10^1) million of population, with a correlation between the countries of 250 (= $10^{2.4}$) to 100 (10^2) participants. **UCLA,** Simple and Multiple Regression.
[213] Note, that it is not meant that GDP per capita causes higher country performance.

to country-pair performance, except for deal flow, where the impact is negative with a coefficient of -0.42, which supports the fact of large money transfers between the US and the UK. **Common history** is significant for deal flow and activity percentage, with a positive impact of 0.45 for dollar amount and 0.30 for activity — noticeable that for the deal flow-denominated investment the affinity between countries has to be higher than for participation. The indicators **common currency** and **common legal system** are significant with a negative coefficient, with the exception, for the latter, of deal participation and deal flow. The negative coefficients indicate that a common currency and legal system does not increase the country-pair probability for cross-border investment.

Traditional gravity model indicators validate that the gravity model works well to explain cross-border PE activity. The beta coefficients indicate that economic mass, common language, and reduced distance are the best indicators for increased cross-border activity. Common history supports this theory, especially for the deal flow between countries, whereas common currency, common legal system, and common border have a contrary effect on PE investment.

3) Country pair specific indicators: Investigating the country pair indicators, the **exchange rates** of the source country in the deal flow model has negative impact on cross-border activity, which is not expected. **Openness of import-export** of the source country is, as expected, positive for participation, deal-flow, and activity percentage, with the largest effect for deal flow of 0.4498. For the host country, openness of import-export is significant for deal participation and activity percentage. Indicator country **development** is not significant.

Of the sixteen specific cross-border activity indicators derived from the gravity model, seven are significant for all models and five are significant for particular cases.

4.3.1.2.   Estimates from private equity indicators

The analysis then expands to look at indicators derived specifically from PE economics. The three categories examined are banking indicators, country endowment indicators, and institutional / legal / political indicators. The number of observations is constant, assuring a consistent statistical population. The regressions for the models are presented in the gravity model equation with the full set of variables (Equation 20), with specific variables in parentheses.

4.3.1.2.1. Banking and financial system variables

The banking indicators clarify the effect of the financial environment of source and host on cross-border activity. Analysis focuses on the impact of banking system size, banking efficiency, and banking competitiveness of the countries.

Table 28: Gravity model estimates for the banking sector

Gravity model analysis	log	Source Host		Participation Numberofobs=2266 F(45,2220)=40.99 Prob>F=0 R-squared=0.4912 RootMSE=0.89952			Deal participation Numberofobs=2266 F(45,2220)=31.56 Prob>F=0 R-squared=0.3884 RootMSE=1.0551			Dealflow Numberofobs=1968 F(45,1922)=22.72 Prob>F=0 R-squared=0.3713 RootMSE=1.6107			Activity % Numberofobs=2266 F(45,2220)=36.42 Prob>F=0 R-squared=0.4486 RootMSE=1.0364		
Indicators				Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
A) Gravity model indicators															
1) Economic mass			(+)												
Population	log	S	(+)	**0.2648**	0.000	0.320	**0.1876**	0.000	0.212	**0.5062**	0.000	0.385	**0.2820**	0.000	0.308
		H	(+)	**0.2613**	0.000	0.330	**0.2630**	0.000	0.311	**0.3894**	0.000	0.311	**0.3023**	0.000	0.345
2) Economic distance			(-)												
Distance	log	(-)		**-0.3562**	0.000	-0.338	**-0.3822**	0.000	-0.339	**-0.5017**	0.000	-0.295	**-0.4209**	0.000	-0.361
Factors eco. distance:			(+)												
Common language			(+)	**0.6004**	0.000	0.194	**0.6406**	0.000	0.194	**0.7398**	0.000	0.154	**0.6832**	0.000	0.200
Common border			(+)	-0.0536	0.491	-0.016	-0.0939	0.299	-0.026	**-0.4054**	0.014	-0.072	**-0.1934**	0.033	-0.051
Common history			(+)	0.1491	0.142	0.023	0.1743	0.125	0.025	0.2252	0.244	0.023	0.1903	0.111	0.027
Common currency			(+)	**-0.5162**	0.000	-0.088	**-0.4484**	0.000	-0.072	**-0.7041**	0.000	-0.069	**-0.5954**	0.000	-0.092
Common legal system			(+)	**-0.1315**	0.009	-0.051	-0.0476	0.430	-0.017	0.0006	0.996	0.000	-0.0765	0.191	-0.027
3) Country pair specific															
Exchange rates		S	(+)	**-0.0067**	0.002	-0.061	**-0.0065**	0.013	-0.055	**-0.0162**	0.000	-0.089	**-0.0090**	0.000	-0.073
		H	(-)	**-0.0048**	0.011	-0.048	-0.0025	0.211	-0.023	-0.0053	0.231	-0.031	**-0.0050**	0.024	-0.045
Openness of im- and exports to GDP		S	(+)	**0.1397**	0.000	0.084	0.0160	0.738	0.009	**0.3895**	0.000	0.148	**0.1499**	0.001	0.082
		H	(+)	0.0361	0.398	0.017	**0.1459**	0.003	0.065	0.1183	0.194	0.035	**0.1225**	0.011	0.053
Development		S	(+)	**0.9409**	0.000	0.192	**1.0045**	0.000	0.192	**2.0453**	0.000	0.258	**1.2039**	0.000	0.222
		H	(+)	**0.5143**	0.000	0.156	**0.3914**	0.013	0.111	**0.7526**	0.011	0.138	**0.5349**	0.001	0.147
B) Private Equity related indicators															
1) Banking system															
1.1 Size			(+)												
M2 to GDP		S	(+)	**-0.1140**	0.042	-0.042	**-0.1365**	0.048	-0.047	-0.0934	0.397	-0.021	-0.1070	0.112	-0.035
		H	(+)	**-0.2325**	0.000	-0.075	**-0.2645**	0.001	-0.079	-0.0721	0.617	-0.014	**-0.1688**	0.033	-0.049
Private credit to GDP		S	(+)	**0.5903**	0.000	0.248	**0.8080**	0.000	0.318	**1.1051**	0.000	0.292	**0.7965**	0.000	0.303
		H	(+)	**0.3613**	0.000	0.159	**0.3638**	0.000	0.150	**0.3961**	0.003	0.109	**0.3477**	0.000	0.138
1.2 Efficiency			(+)												
Return on assets		S	(+)	0.0005	0.478	0.010	-0.0002	0.832	-0.004	-0.0011	0.433	-0.016	-0.0001	0.909	-0.002
		H	(+)	0.0000	0.960	-0.001	-0.0003	0.594	-0.011	0.0007	0.414	0.018	0.0004	0.468	0.015
Operating costs to total assets		S	(-)	-0.0002	0.287	-0.023	**-0.0005**	0.049	-0.054	-0.0001	0.820	-0.007	-0.0002	0.461	-0.018
		H	(-)	-0.0001	0.476	-0.015	-0.0001	0.613	-0.012	0.0007	0.019	0.075	0.0003	0.185	0.037
Net interest margin		S	(+)	**0.1518**	0.000	0.121	**0.1583**	0.000	0.118	**0.2706**	0.001	0.130	**0.2082**	0.000	0.150
		H	(+)	**0.0558**	0.049	0.055	**0.0827**	0.004	0.077	**0.1187**	0.008	0.075	**0.0830**	0.006	0.075
1.3 Competitiveness			(+)												
Interest rate spread		S	(+)	-0.0048	0.107	-0.029	-0.0034	0.322	-0.019	-0.0084	0.344	-0.026	-0.0043	0.178	-0.024
		H	(+)	-0.0054	0.284	-0.018	-0.0100	0.126	-0.032	0.0005	0.959	0.001	-0.0058	0.367	-0.018
Number of banks per GDP		S	(+)	0.0000	0.120	0.064	**0.0000**	0.026	0.099	0.0000	0.307	-0.057	0.0000	0.246	0.048
		H	(+)	**0.0001**	0.000	0.196	**0.0000**	0.012	0.103	**0.0001**	0.017	0.116	**0.0001**	0.000	0.137
2) Endowment-related variables															
2.2 Corporate eco. conditions			(+)												
GDP per capita	log	S	(+)	0.2625	0.064	0.087	-0.0363	0.827	-0.011	0.1054	0.681	0.021	0.1247	0.420	0.037
		H	(+)	**0.2753**	0.005	0.131	0.1714	0.129	0.076	0.1524	0.459	0.045	0.2222	0.052	0.096

The models are statistically significant, with an increase of R-squared to 49% for participation, 39% for deal participation, 37% for deal flow, and 45% for activity percentage.

The newly introduced banking indicators affect the significance of the mass, distance, and country pair indicators. Focusing on the banking system variables first, the results in detail are:

Banking size: The two traditional indicators for banking system size **— M2 to GDP** and **private credit to GDP** — are statistically significant, except for M2 to

GDP in the deal-flow model and for source in the activity percentage model. M2 to GDP, contrary to the assumption of banking size, has a negative coefficient for the models (source between -0.1140 and -0.1365, and host between -0.1688 and -0.2645), indicating that countries with less liquidity compared to GDP seem to have more cross-border activity. The positive coefficients of private credit to GDP confirm the assumption of the importance of banking size in the private credit segment, especially for source (between 0.5903 and 1.1051) and host (between 0.3477 and 0.3961) for all variables. This indicates that countries with large relative private credit tend to have more cross-border PE investment. The beta coefficient is largest for source countries.

Banking efficiency: The indicator **return on assets** is not significant. **Operating costs to total assets** is significant and negative-related for the source country in deal participation, as expected. It is further significant but positive-related for host in the deal flow model, indicating an investment flow into countries with less efficiency. **Net interest margin** is significant and has positive coefficients for all models, indicating that countries with an efficient banking system tend to have more cross-border deals. The high-interest margins of source countries seem to have an especially large impact on cross-border activity, verified by comparing beta coefficients. The indicators, if significant, have the expected results, with greater strength in the source country for net-interest margin compared to host country, and a relatively low magnitude for operating costs.

Competitiveness: The indicators for competitiveness are **interest rate spread** and **number of banks per GDP**. The number of banks indicator is significant for source deal participation and for all host country models. The coefficients have the expected positive sign, with beta coefficients for the host country between 0.103 and 0.196, indicating the high impact of competitiveness for cross-border deals.

Incorporation of banking system variables into the model affects the previously analyzed gravity model indicators. The **economic mass** indicator **GDP per capita** is significant for the host in the participation model, with a decline in magnitude compared to the previous model. Within the **economic distance** indicators, **common border** becomes significant for the activity percentage with a negative coefficient. The indicator **common legal system** is significant for the participation model, and **common history** is not significant for any of the models.

Within the **country pair specific** indicators, **exchange rate** for source becomes significant for all models, although with a negative sign.

Openness to import / export is similarly significant, as in the previous analysis, for participation, deal flow, and activity percentage for source, and in deal participation and activity percentage for host, supporting the assumption that import / export-oriented countries have more cross-border PE investment. Most changes affect variable **development**. Development is significant for all models, with a coefficient for source between 0.94 and 2.05, and for host between 0.39 and 0.75, indicating that investors originate from highly developed countries and focus on an equal level of country development for their cross-border investments.

In this model, the most important variables by coefficient are **population, geographic distance**, **language,** and **private credit to GDP** for the source country, verifying the gravity model with mass and distance, and the large impact of banking size in the source country.

The banking indicators help to analyze the impact on PE cross-border activity as a proxy for a banking system's size, efficiency, and competitiveness. Indicators with large beta coefficients support the assumptions. The variable **M2 to GDP** and the indicator **operating costs to total assets** for the deal-flow model have an inverse direction. The negative M2 to GDP, although with a small beta coefficient, could be interpreted that countries with less liquidity tend to have a greater tendency to invest abroad. Operating cost may be interpreted as flow from efficient to less efficient banking systems, but with a small magnitude.

4.3.1.2.2. Endowment variables

Endowment-related variables dissect the impact of the stage-specific economic market environment by combining the company life-cycle with the PE investment process, resulting in the three categories of scientific competitiveness, corporate economic conditions, and exit possibilities.

Table 29: Gravity model estimates for endowment-related variables

Gravity model analysis	log	Source Host		Participation Numberofobs=2266 F(57,2208)=37.48 Prob>F=0 R-squared=0.5198 RootMSE=0.87627			Deal participation Numberofobs=2266 F(57,2208)=29.62 Prob>F=0 R-squared=0.4293 RootMSE=1.022			Dealflow Numberofobs=1968 F(57,1910)=23.1 Prob>F=0 R-squared=0.413 RootMSE=1.5613			Activity % Numberofobs=2266 F(57,2208)=34.8 Prob>F=0 R-squared=0.4883 RootMSE=1.0011		
Indicators				Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
A) Gravity model indicators															
1) Economic mass			(+)												
Population	log	S	(+)	0.1825	0.033	0.221	0.1872	0.055	0.212	0.3201	0.016	0.243	0.2599	0.017	0.284
		H	(+)	0.2033	0.000	0.257	0.2355	0.000	0.278	0.6202	0.000	0.495	0.3621	0.000	0.414
2) Economic distance			(-)												
Distance	log		(-)	-0.3922	0.000	-0.372	-0.4353	0.000	-0.386	-0.5636	0.000	-0.332	-0.4790	0.000	-0.411
Factors eco. distance:			(+)												
Common language			(+)	0.5909	0.000	0.191	0.6468	0.000	0.196	0.7506	0.000	0.156	0.6893	0.000	0.201
Common border			(+)	-0.0064	0.932	-0.002	-0.0448	0.608	-0.012	-0.3305	0.040	-0.059	-0.1515	0.080	-0.040
Common history			(+)	0.0797	0.422	0.012	0.0393	0.723	0.006	0.0565	0.760	0.006	0.0635	0.580	0.009
Common currency			(+)	-0.4702	0.000	-0.081	-0.3916	0.000	-0.063	-0.6569	0.000	-0.064	-0.5410	0.000	-0.084
Common legal system			(+)	-0.1179	0.017	-0.046	-0.0488	0.409	-0.018	0.0116	0.910	0.003	-0.0726	0.204	-0.026
3) Country pair specific															
Exchange rates		S	(+)	-0.0026	0.270	-0.024	-0.0013	0.645	-0.011	-0.0094	0.033	-0.052	-0.0031	0.253	-0.026
		H	(-)	-0.0045	0.019	-0.044	-0.0020	0.332	-0.018	-0.0089	0.042	-0.052	-0.0054	0.013	-0.049
Openness of im- and exports to GDP		S	(+)	0.1634	0.000	0.098	0.0152	0.788	0.009	0.3015	0.000	0.115	0.1395	0.008	0.076
		H	(+)	0.0579	0.207	0.027	0.1357	0.009	0.060	0.0969	0.317	0.029	0.1260	0.015	0.054
Development		S	(+)	1.2696	0.000	0.259	1.4427	0.000	0.275	2.4272	0.000	0.306	1.6174	0.000	0.298
		H	(+)	0.8571	0.000	0.260	0.7778	0.000	0.221	1.2805	0.000	0.235	0.9195	0.000	0.252
B) Private Equity related indicators															
1) Banking system															
1.1 Size			(+)												
M2 to GDP		S	(+)	-0.2130	0.000	-0.078	-0.2730	0.000	-0.093	-0.3508	0.002	-0.080	-0.2475	0.000	-0.081
		H	(+)	-0.2829	0.000	-0.091	-0.2734	0.000	-0.082	-0.1085	0.471	-0.022	-0.1753	0.026	-0.051
Private credit to GDP		S	(+)	0.3834	0.000	0.161	0.5316	0.000	0.209	0.6257	0.000	0.165	0.5089	0.000	0.194
		H	(+)	0.2114	0.001	0.093	0.1797	0.016	0.074	0.1519	0.247	0.042	0.1762	0.022	0.070
1.2 Efficiency			(+)												
Return on assets		S	(+)	0.0002	0.834	0.004	-0.0005	0.655	-0.010	-0.0017	0.327	-0.025	-0.0004	0.660	-0.009
		H	(+)	-0.0001	0.889	-0.002	-0.0003	0.565	-0.011	0.0007	0.386	0.019	0.0004	0.433	0.015
Operating costs to total assets		S	(-)	0.0000	0.981	0.001	-0.0002	0.363	-0.027	0.0003	0.439	0.024	0.0001	0.641	0.013
		H	(-)	-0.0001	0.567	-0.012	0.0000	0.985	0.000	0.0007	0.020	0.072	0.0003	0.131	0.040
Net interest margin		S	(+)	0.1878	0.000	0.149	0.1903	0.000	0.142	0.2337	0.009	0.112	0.2357	0.000	0.169
		H	(+)	0.0946	0.001	0.094	0.1133	0.000	0.105	0.1626	0.001	0.103	0.1182	0.000	0.106
1.3 Competitiveness			(+)												
Interest rate spread		S	(+)	-0.0040	0.177	-0.024	-0.0023	0.501	-0.018	-0.0059	0.464	-0.018	-0.0033	0.298	-0.018
		H	(+)	-0.0057	0.247	-0.020	-0.0093	0.144	-0.030	-0.0023	0.801	-0.005	-0.0058	0.351	-0.018
Number of banks per GDP		S	(+)	0.0000	0.042	0.099	0.0000	0.013	0.130	0.0000	0.830	-0.013	0.0000	0.155	0.070
		H	(+)	0.0001	0.000	0.266	0.0001	0.000	0.185	0.0001	0.000	0.195	0.0001	0.000	0.208
2) Endowment-related variables															
2.1 Scientific competitiveness			(+)												
Engineers & scientists/('000)		S	(+)	0.0000	0.104	0.044	0.0000	0.503	0.021	0.0001	0.099	0.047	0.0001	0.058	0.053
		H	(+)	0.0000	0.274	0.029	0.0001	0.006	0.077	0.0000	0.745	0.011	0.0001	0.014	0.067
Patents residential	log	S	(+)	0.0437	0.059	0.082	0.0336	0.239	0.059	0.0208	0.587	0.024	0.0264	0.310	0.045
		H	(+)	0.0508	0.004	0.092	0.0413	0.049	0.070	-0.0076	0.835	-0.009	0.0261	0.210	0.043
Patents non residential	log	S	(-)	-0.0739	0.001	-0.090	-0.0692	0.008	-0.078	-0.1303	0.017	-0.090	-0.0879	0.001	-0.096
		H	(-)	-0.0796	0.000	-0.095	-0.1252	0.000	-0.140	-0.1570	0.003	-0.109	-0.1215	0.000	-0.131
2.2 Corporate eco. conditions			(+)												
GDP per capita	log	S	(+)	-0.3007	0.164	-0.100	-0.4790	0.076	-0.148	-0.4620	0.279	-0.093	-0.3181	0.205	-0.095
		H	(+)	-0.4918	0.003	-0.235	-0.5187	0.005	-0.231	-0.5014	0.141	-0.149	-0.4307	0.021	-0.186
Wages in countries	log	S	(+)	0.0550	0.634	0.029	0.0474	0.735	0.023	-0.1835	0.314	-0.059	-0.0072	0.958	-0.003
		H	(+)	0.2751	0.001	0.209	0.2346	0.009	0.167	0.6042	0.000	0.282	0.3419	0.000	0.235
Corporate tax rates		S	(-)	-0.0198	0.000	-0.120	-0.0360	0.000	-0.204	-0.0407	0.000	-0.152	-0.0335	0.000	-0.183
		H	(-)	-0.0143	0.000	-0.087	-0.0148	0.001	-0.084	-0.0350	0.000	-0.130	-0.0176	0.000	-0.097
2.3 Exit possibilities			(+)												
Stock market capitalization	log	S	(+)	0.1531	0.005	0.224	0.1449	0.020	0.199	0.3787	0.000	0.350	0.1783	0.017	0.236
		H	(+)	0.0646	0.004	0.102	0.0548	0.036	0.081	-0.0985	0.030	-0.098	-0.0027	0.918	-0.004

For the models under consideration, the overall significance increased to 52% for participation, 43% for deal participation, 41% for deal flow, and 49% for activity percentage.

The endowment-related variables for scientific competitiveness are **engineers and scientists,** and **patents residential** and **nonresidential**. They function as a proxy for the skill and knowledge base in a country. Higher levels of engineers, scientists, and patents residential are associated with higher skill endowment and

knowledge. Patents nonresidential are associated with barriers to scientific competitiveness. The indicators for corporate economic conditions explain a level of attractiveness of a country for PE investment with the variables **GDP per capita**, **average wages** and **corporate tax rates**. The exit possibility is determined by the **stock market capitalization** of a country.

In the **scientific competitiveness** category, **engineers and scientists** is significant for deal participation and activity for host country, with a positive sign. **Patents residential** is significant for the host in participation and deal participation, with a positive sign, as expected. **Patents nonresidential** is significant, with a negative sign for all models. The coefficients of patent applications indicate that investors focus on the more scientifically competitive countries, with less impact from foreign patent applicants. Scientific competitiveness has a high positive impact on cross-border deals, especially for host countries.

For the corporate economic indicators, it is noticeable that including the endowment variables has the consequence that **GDP per capita** is negative for the host countries in the significant models, with a high beta coefficient.

Wages are significant and, as expected, positive-related in the host country for all models, indicating that host countries with higher average wages, and thus an attractive and skilled labor force, are likely to be target countries.

Corporate tax rates are all significant, with negative coefficients of larger magnitude for the source country. Lower corporate tax rates seem to support cross-border transactions for both source and host countries.

As a proxy for exit possibilities, **stock market capitalization** in a source country is significantly positive-related for all variables, with beta coefficients between 0.18 and 0.38. The large magnitude implies that countries with a large stock-market capitalization are more likely to participate and invest cross-border. From the host country perspective, the coefficients for participation and deal participation are positive, signifying that source countries want to invest in host countries with developed stock markets. The deal-flow model, with its negative coefficient for the host county, indicates a different behavior, with investment flows from well-developed stock markets to less-developed stock markets.

In the category of endowment-related variables, GDP per capita, wages for host country, and stock market capitalization have the largest leverage.

4.3.1.2.3.   Institutional / legal / political system variables

The institutional / legal / political category is the last segment in the gravity model regression. The variables illuminate the general country-specific conditions for PE cross-border investment. The three subcategories are institutional stability and quality, legal regime, and freedom. The indicators for political rights and civil rights are highlighted with negative indicators, because of the scaling of the original data from low to high, with a low number indicating more freedom.

Table 30: Gravity model analysis results

Gravity model analysis				Participation			Deal participation			Dealflow			Activity %		
				Numberofobs=2266			Numberofobs=2266			Numberofobs=1968			Numberofobs=2266		
				F(75,2190)=35.15			F(75,2190)=27.37			F(75,1892)=22.85			F(75,2190)=31.91		
Indicators	log	Source		Prob>F=0			Prob>F=0			Prob>F=0			Prob>F=0		
		Host		R-squared=0.5714			R-squared=0.4791			R-squared=0.4468			R-squared=0.5362		
				RootMSE=0.83123			RootMSE=0.98035			RootMSE=1.5229			RootMSE=0.95707		
A) Gravity model indicators				Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
1) Economic mass			(+)												
Population	log	S	(+)	**0.2376**	0.002	0.287	**0.1864**	0.031	0.211	**0.4340**	0.001	0.330	**0.2803**	0.001	0.306
		H	(+)	**0.2824**	0.000	0.357	**0.2999**	0.000	0.355	**0.6662**	0.000	0.532	**0.4271**	0.000	0.488
2) Economic distance			(-)												
Distance	log		(-)	**-0.4739**	0.000	-0.450	**-0.5258**	0.000	-0.467	**-0.5940**	0.000	-0.350	**-0.5445**	0.000	-0.467
Factors eco. distance:			(+)												
Common language			(+)	**0.3640**	0.000	0.118	**0.3838**	0.000	0.116	**0.5635**	0.000	0.117	**0.4625**	0.000	0.135
Common border			(+)	0.0060	0.936	0.002	-0.0272	0.757	-0.007	-0.2445	0.133	-0.044	-0.1158	0.180	-0.031
Common history			(+)	-0.0671	0.493	-0.010	-0.1131	0.298	-0.016	-0.1214	0.511	-0.012	-0.0855	0.449	-0.012
Common currency			(+)	**-0.3777**	0.000	-0.065	**-0.2743**	0.008	-0.044	**-0.7340**	0.000	-0.072	**-0.4745**	0.000	-0.073
Common legal system			(+)	0.0854	0.098	0.033	**0.1505**	0.014	0.055	0.1479	0.166	0.036	0.0972	0.109	0.034
3) Country pair specific															
Exchange rates		S	(+)	**0.0056**	0.034	0.050	0.0053	0.094	0.045	0.0031	0.529	0.017	0.0059	0.051	0.048
		H	(-)	-0.0001	0.941	-0.001	0.0025	0.248	0.023	-0.0054	0.262	-0.032	-0.0023	0.318	-0.021
Openness of im- and exports to GDP		S	(+)	**0.2616**	0.004	0.158	0.1263	0.257	0.071	**0.6456**	0.000	0.245	**0.3809**	0.000	0.207
		H	(+)	0.0384	0.574	0.018	**0.1542**	0.042	0.068	0.0768	0.631	0.023	0.1000	0.210	0.043
Development		S	(+)	0.3770	0.150	0.077	0.5456	0.073	0.104	0.8266	0.116	0.104	**0.6438**	0.021	0.119
		H	(+)	0.3013	0.053	0.091	0.3344	0.067	0.095	**0.7868**	0.034	0.144	**0.4480**	0.013	0.123
B) Private Equity related indicators															
1) Banking system															
1.1 Size			(+)												
M2 to GDP		S	(+)	0.0242	0.770	0.009	-0.1227	0.230	-0.042	0.2927	0.061	0.067	0.0649	0.492	0.021
		H	(+)	**-0.3356**	0.000	-0.108	**-0.3965**	0.000	-0.119	-0.1353	0.447	-0.027	**-0.2895**	0.001	-0.084
Private credit to GDP		S	(+)	**0.2922**	0.002	0.123	**0.4175**	0.000	0.164	**0.4559**	0.009	0.120	**0.4416**	0.000	0.168
		H	(+)	0.1101	0.137	0.049	0.0960	0.262	0.040	0.1408	0.364	0.039	0.0873	0.319	0.035
1.2 Efficiency			(+)												
Return on assets		S	(+)	0.0000	0.947	-0.001	-0.0008	0.434	-0.015	-0.0020	0.252	-0.030	-0.0007	0.419	-0.014
		H	(+)	-0.0003	0.496	-0.011	-0.0006	0.291	-0.021	0.0007	0.335	0.019	0.0002	0.629	0.009
Operating costs to total assets		S	(-)	0.0000	0.820	-0.005	-0.0005	0.094	-0.051	0.0003	0.425	0.027	0.0001	0.818	0.006
		H	(-)	-0.0003	0.056	-0.043	-0.0003	0.078	-0.045	0.0005	0.132	0.054	-0.0001	0.719	-0.010
Net interest margin		S	(+)	**0.1002**	0.016	0.080	0.0850	0.114	0.063	0.0583	0.553	0.028	**0.1376**	0.001	0.099
		H	(+)	0.0520	0.082	0.052	**0.0649**	0.033	0.060	**0.1447**	0.005	0.091	**0.0792**	0.015	0.071
1.3 Competitiveness			(+)												
Interest rate spread		S	(+)	-0.0026	0.332	-0.016	-0.0001	0.961	-0.001	-0.0027	0.555	-0.008	-0.0013	0.577	-0.007
		H	(+)	0.0010	0.846	0.003	-0.0028	0.665	-0.009	0.0030	0.764	0.006	0.0012	0.849	0.004
Number of banks per GDP		S	(+)	**0.0000**	0.029	0.114	**0.0000**	0.012	0.146	0.0000	0.891	0.010	0.0000	0.134	0.078
		H	(+)	**0.0001**	0.000	0.215	**0.0000**	0.007	0.129	**0.0001**	0.024	0.134	**0.0001**	0.002	0.140
2) Endowment-related variables															
2.1 Scientific competitiveness			(+)												
Engineers & scientists/('000)		S	(+)	**0.0002**	0.000	0.185	**0.0002**	0.000	0.155	**0.0003**	0.000	0.187	**0.0002**	0.000	0.200
		H	(+)	**0.0001**	0.001	0.117	**0.0002**	0.000	0.168	0.0001	0.289	0.048	**0.0001**	0.000	0.143
Patents residential	log	S	(+)	0.0491	0.068	0.093	0.0549	0.100	0.097	0.0424	0.322	0.049	0.0547	0.063	0.093
		H	(+)	0.0285	0.116	0.051	0.0285	0.186	0.048	-0.0120	0.756	-0.014	0.0153	0.482	0.025
Patents non residential	log	S	(-)	**-0.0517**	0.036	-0.063	-0.0396	0.163	-0.045	-0.0798	0.173	-0.055	-0.0519	0.076	-0.057
		H	(-)	-0.0106	0.639	-0.013	**-0.0496**	0.049	-0.055	-0.1101	0.062	-0.077	-0.0501	0.067	-0.054
2.2 Corporate eco. conditions			(+)												
GDP per capita	log	S	(+)	0.1598	0.513	0.053	-0.2981	0.331	-0.092	0.1984	0.703	0.040	-0.0205	0.941	-0.006
		H	(+)	-0.0052	0.978	-0.002	-0.1302	0.540	-0.058	-0.1136	0.783	-0.034	-0.0674	0.754	-0.029
Wages in countries	log	S	(+)	-0.1634	0.217	-0.086	-0.0577	0.715	-0.028	**-0.6184**	0.006	-0.198	-0.2415	0.105	-0.114
		H	(+)	**0.1954**	0.039	0.148	**0.2105**	0.049	0.149	**0.5237**	0.014	0.245	**0.3097**	0.005	0.213
Corporate tax rates		S	(-)	**-0.0191**	0.001	-0.116	**-0.0275**	0.000	-0.156	**-0.0378**	0.001	-0.141	**-0.0285**	0.000	-0.156
		H	(-)	**-0.0124**	0.005	-0.076	**-0.0129**	0.011	-0.074	**-0.0316**	0.006	-0.117	**-0.0137**	0.010	-0.076
2.3 Exit possibilities			(+)												
Stock market capitalization	log	S	(+)	**0.1161**	0.004	0.170	**0.1025**	0.011	0.140	**0.2896**	0.000	0.267	**0.1293**	0.007	0.171
		H	(+)	0.0247	0.297	0.039	0.0140	0.650	0.021	**-0.1009**	0.025	-0.100	-0.0348	0.211	-0.049
3) Institutional/ legal/ political															
3.1 Institut. stability & quality			(+)												
Rule of law		S	(+)	0.2225	0.378	0.086	0.4231	0.194	0.154	-0.3630	0.445	-0.086	0.2550	0.375	0.089
		H	(+)	**0.9410**	0.000	0.496	**0.9631**	0.000	0.475	0.7419	0.074	0.239	**1.0404**	0.000	0.496
Political stability		S	(+)	**-0.5215**	0.000	-0.216	**-0.4771**	0.000	-0.185	**-0.9500**	0.000	-0.243	**-0.5835**	0.000	-0.219
		H	(+)	**-0.6675**	0.000	-0.347	**-0.6479**	0.000	-0.315	**-0.4115**	0.003	-0.135	**-0.6111**	0.000	-0.287
Regulatory quality		S	(+)	**0.5146**	0.000	0.180	**0.5800**	0.002	0.189	**0.7582**	0.016	0.165	**0.5754**	0.001	0.182
		H	(+)	0.0748	0.533	0.033	-0.0895	0.522	-0.037	**0.5300**	0.048	0.145	0.1801	0.209	0.072
Control of corruption		S	(+)	-0.0622	0.743	-0.031	-0.3222	0.179	-0.151	0.6318	0.085	0.194	-0.0596	0.782	-0.027
		H	(+)	**-0.3688**	0.004	-0.246	**-0.4575**	0.001	-0.286	-0.5185	0.094	-0.212	**-0.5967**	0.000	-0.360
3.2 Legal regimes and origin															
Common law		S		0.2164	0.052	0.086	**0.4232**	0.002	0.156	**0.4252**	0.031	0.105	**0.4533**	0.000	0.162
		H		0.0881	0.311	0.033	0.1139	0.254	0.040	-0.0110	0.955	-0.003	0.0185	0.855	0.006
Civil law		S		**-0.1564**	0.037	-0.060	-0.0733	0.442	-0.026	-0.0242	0.848	-0.006	-0.0724	0.389	-0.025
		H		0.0112	0.863	0.004	0.0174	0.818	0.006	-0.1547	0.294	-0.037	0.0072	0.926	0.003
3.3 Freedom			(+)												
Political rights		S	(-)	**-0.1737**	0.005	-0.189	-0.1430	0.068	-0.145	**-0.2189**	0.040	-0.148	**-0.1828**	0.007	-0.180
		H	(-)	**0.1587**	0.000	0.180	**0.1537**	0.002	0.163	0.1696	0.085	0.118	**0.2011**	0.000	0.207
Civil rights		S	(-)	**0.1453**	0.005	0.130	**0.1471**	0.026	0.123	-0.0491	0.628	-0.027	0.0910	0.126	0.073
		H	(-)	-0.0301	0.518	-0.030	-0.0386	0.475	-0.036	-0.0926	0.377	-0.057	-0.0867	0.117	-0.079
Economic freedom		S	(+)	-0.0036	0.603	-0.025	0.0017	0.836	0.011	-0.0187	0.178	-0.079	-0.0110	0.162	-0.069
		H	(+)	0.0079	0.174	0.056	**0.0153**	0.019	0.101	-0.0114	0.368	-0.050	0.0114	0.094	0.073

The analysis, with all variables included in the gravity regression, explains a high proportion of variation in cross-border investment activity. The R-squared of the models is 57% for participation, 48% for deal participation, 45% for deal flow, and 54% for activity. The **institutional variables,** with their aggregated indicators of political stability, regulatory quality, rule of law, and control of corruption, characterize the general stability and quality of the economic system in a country.

The **rule of law** is significant, as expected, for host country in terms of participation, deal participation, and activity percentage, and implies that high standards for social and judicial rules, especially the quality of contract enforcement and the courts, is crucial for firms considering investment abroad. Contrary to the assumption of the regression model, the **political stability** coefficient is negative for all models. The reason for the negative indication is high volatility for countries like the US and the UK, with low political stability rankings due to threats of terrorism.

The indicator of **regulatory quality** is significant, with a positive coefficient for the source country in all models, and for host in the deal-flow model. This variable indicates that governmental permission and promotion of private sector development is fundamental to support cross-border investment, especially for high-dollar-amount investment.[214]

The coefficients for **control of corruption** are significant and negative-related for host country for the models participation, deal participation, and activity. The coefficient results are inverse to the assumption: investors tend to put money into countries with a lack of control of corruption.

The **indicators for legal regime** identify if the origin of the legal system has an influence on cross-border transactions. **Common law** in a source country is significant for deal participation, deal flow, and activity. **Civil law** is significant for source in the participation model, with a negative coefficient. Overall, the variables signify that the type of legal system is important for the source country, with the common law system supporting cross-border deals.

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[214] **Kaufmann; Kraay and Mastruzzi,** Governance Matters 2007 Worldwide Governance Indicators, 1996-2006, p. 4.

The **freedom variables** indicate the state of freedom and civil liberties within a country and describe the opportunity to act spontaneously outside the control of the government and other centers of potential domination.

Freedom of **political rights** is important in the source country, where the variable is positive-related for participation, deal participation, and activity percentage. For host, the variable is negative-related for participation, deal participation, and activity percentage. The variables verify that cross-border investment takes place from countries with a high standard of political freedom toward low-standard countries. The positive coefficient for the indicator of **civil rights** in the source country, for participation and deal participation, signify a high participation in cross-border deals by countries with a low standard of civil rights.

The last indicator, **economic freedom,** expresses the possibility of setting up new businesses and acting in an economically beneficial way. Economic freedom is significant for a host country in the deal participation model. The possibility to act in an economically beneficial manner is important for cross-border deal investment in the host country.

4.3.2. Analysis applied to venture capital and private equity

The following section separates the analytical steps into the financing stages of a company: VC and PE. Results are presented for a regression with gravity model indicators and for the full set of variables. The intermediate steps (seen above in Chapter 4.3.1.2.) are omitted here.

4.3.2.1. Venture capital investment

The analysis of VC cross-border deals investigates the determinants of early company stages — seed, startup, and expansion. The equations of the regressions are similar to the gravity model with overall investment; only the dependent variable is confined to VC investment. In the models, the numbers of observations for participation, deal participation, and activity are **2,012**, and **1,744** for deal flow — fewer compared to overall investment. The details of the first gravity model indicator analysis are:

Table 31: Results with gravity model indicators (VC)

Gravity model analysis				Participation			Deal participation			Dealflow			Activity %		
Venture Capital				_I__fi_par~c			_I__fi_cou~c			_I__fi_dea~c			_I__percen~c		
				Numberofobs=2012			Numberofobs=2012			Numberofobs=1744			Numberofobs=2012		
Indicators	log	Source		F(31,1980)=32.8			F(31,1980)=23.54			F(31,1712)=17.03			F(31,1980)=27.93		
		Host		Prob>F=0			Prob>F=0			Prob>F=0			Prob>F=0		
				R-squared=0.3848			R-squared=0.2723			R-squared=0.2749			R-squared=0.3369		
				RootMSE=0.94335			RootMSE=1.1137			RootMSE=1.6727			RootMSE=1.0902		
A) Gravity model indicators				Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
1) Economic mass			(+)												
Population	log	S	(+)	0.3443	0.000	0.438	0.3628	0.000	0.426	0.5610	0.000	0.442	0.4150	0.000	0.475
		H	(+)	0.3864	0.000	0.517	0.3314	0.000	0.409	0.4979	0.000	0.414	0.3876	0.000	0.466
2) Economic distance			(-)												
Distance	log		(-)	-0.1883	0.000	-0.187	-0.2050	0.000	-0.187	-0.3394	0.000	-0.204	-0.2479	0.000	-0.221
Factors eco. distance:			(+)												
Common language			(+)	0.5652	0.000	0.194	0.6175	0.000	0.195	0.5724	0.000	0.124	0.6479	0.000	0.199
Common border			(+)	-0.0779	0.346	-0.024	-0.1346	0.172	-0.038	-0.4557	0.011	-0.084	-0.2312	0.019	-0.064
Common history			(+)	0.2671	0.037	0.044	0.2619	0.062	0.040	0.4966	0.025	0.052	0.3379	0.018	0.050
Common currency			(+)	-0.6204	0.000	-0.111	-0.6379	0.000	-0.106	-0.8976	0.000	-0.088	-0.7588	0.000	-0.122
Common legal system			(+)	-0.1374	0.014	-0.056	-0.0534	0.434	-0.020	-0.0773	0.503	-0.019	-0.1058	0.111	-0.039
3) Country pair specific															
Exchange rates		S	(+)	0.0017	0.475	0.015	0.0030	0.287	0.025	-0.0135	0.002	-0.075	-0.0012	0.657	-0.010
		H	(-)	-0.0040	0.027	-0.041	-0.0004	0.826	-0.004	-0.0055	0.176	-0.033	-0.0061	0.004	-0.056
Openness of im- and exports to GDP		S	(+)	0.1341	0.001	0.085	0.0681	0.155	0.040	0.4084	0.000	0.162	0.1999	0.000	0.113
		H	(+)	0.0528	0.190	0.026	0.1289	0.006	0.058	0.1745	0.034	0.053	0.1175	0.009	0.052
Development		S	(+)	-0.0697	0.698	-0.015	0.0208	0.929	0.004	0.8977	0.010	0.119	0.0295	0.888	0.006
		H	(+)	0.0785	0.490	0.024	-0.0444	0.740	-0.013	-0.5054	0.041	-0.095	-0.1100	0.430	-0.031
2) Endowment-related variables															
GDP per capita	log	S	(+)	1.0562	0.000	0.370	0.9764	0.000	0.315	1.0550	0.000	0.222	1.1312	0.000	0.356
		H	(+)	0.8492	0.000	0.424	0.6163	0.000	0.283	0.9876	0.000	0.306	0.7972	0.000	0.357

The VC models for the gravity indicators are statistically significant, with R-squared at 39% for participation, 27% for deal participation, 28% for deal flow, and 34% for activity. Details explaining the variance of cross-border investment for the dependent variables are:

1) Economic mass: The economic mass indicators **population** and **GDP per capita** are significant for all models, verifying the gravity model theory, with economic mass increasing the propensity toward activity. Population has the largest beta coefficients, especially for the models of participation and activity percentage.

2) Economic distance: The models indicate a similar pattern in economic distance for VC as for the overall model. Increased **geographic distance** negatively affects cross-border activity between countries. **Common language** and **common history** increase the likelihood of cross-border investment, whereas, contrary to the assumptions, **common currency** decreases the likelihood of investment in all models. The **common border** indicator for the deal flow and activity percentage models, and **common legal system** for participation, have negative coefficients. The variables with the largest impact in this category are geographic distance (beta: 0.187 to 0.221) and common language (beta: 0.124 to 0.199).

3) Country pair: In the country pair indicator section, more variables are significant compared to the overall investment models. **Exchange rate** of source country in the deal flow model has negative impact, lowering the assumption of positive impact, whereas for participation and activity percentage it supports the assumption of investment toward low-exchange-rate countries. **Openness of import-export** of the source country is positive for participation, deal flow, and activity percentage, and positive for the host for deal participation, deal flow, and activity percentage, indicating that export and import-oriented countries tend to invest more abroad, as expected from the assumptions. Country **development** is significant for deal flow of the source country, with a positive sign, and negative for the host in the same model, which indicates a deal flow from highly developed countries to less developed countries. The indicator of openness of imports and exports for source in the deal flow model has the largest impact, with a beta coefficient of 0.162.

Analysis of cross-border activity with the gravity model-derived indicators verifies that, similar to the overall analysis, seven indicators are significant for all models, and seven are significant for particular dependent variables for both source and host countries. Overall, the regression analysis for VC deals confirms the gravity model theory.

The gravity model analysis with the full set of determinants for VC deals is presented in Table 32, having the constant number of observations listed in the previous analyses.

Table 32: Results with gravity model and private equity-related indicators (VC)

Gravity model analysis Venture Capital	log	Source Host		Participation Numberofobs=2012 F(75,1936)=26.91 Prob>F=0 R-squared=0.5396 RootMSE=0.82533			Deal participation Numberofobs=2012 F(75,1936)=22.91 Prob>F=0 R-squared=0.4518 RootMSE=0.97754			Dealflow Numberofobs=1744 F(75,1668)=18.28 Prob>F=0 R-squared=0.4027 RootMSE=1.538			Activity % Numberofobs=2012 F(75,1936)=25.75 Prob>F=0 R-squared=0.499 RootMSE=0.95838		
Indicators				Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
A) Gravity model indicators															
1) Economic mass		S	(+)												
Population	log	S	(+)	0.2177	0.003	0.277	0.2237	0.009	0.262	0.4158	0.001	0.327	0.3047	0.000	0.349
		H	(+)	0.2438	0.000	0.327	0.2698	0.000	0.333	0.6978	0.000	0.581	0.4037	0.000	0.486
2) Economic distance			(-)												
Distance	log		(-)	-0.4453	0.000	-0.442	-0.4982	0.000	-0.455	-0.5272	0.000	-0.317	-0.5091	0.000	-0.454
Factors eco. distance:			(+)												
Common language			(+)	0.3744	0.000	0.128	0.4160	0.000	0.131	0.4654	0.000	0.101	0.4809	0.000	0.148
Common border			(+)	-0.0689	0.376	-0.021	-0.1117	0.240	-0.032	-0.2376	0.171	-0.044	-0.1651	0.074	-0.046
Common history			(+)	-0.0897	0.397	-0.015	-0.1532	0.216	-0.023	-0.2158	0.313	-0.023	-0.1095	0.385	-0.016
Common currency			(+)	-0.3469	0.000	-0.062	-0.2695	0.016	-0.045	-0.6546	0.001	-0.064	-0.4772	0.000	-0.077
Common legal system			(+)	0.1129	0.041	0.046	0.1807	0.006	0.068	0.1909	0.094	0.047	0.1129	0.083	0.041
3) Country pair specific															
Exchange rates		S	(+)	0.0050	0.067	0.046	0.0050	0.119	0.043	-0.0021	0.707	-0.011	0.0049	0.119	0.040
		H	(-)	-0.0025	0.260	-0.025	-0.0003	0.911	-0.003	-0.0081	0.130	-0.048	-0.0059	0.025	-0.054
Openness of im- and exports to GDP		S	(+)	0.1734	0.078	0.109	0.0476	0.690	0.028	0.6207	0.001	0.246	0.3153	0.004	0.179
		H	(+)	0.1426	0.061	0.070	0.2406	0.005	0.109	0.1960	0.274	0.059	0.1463	0.110	0.064
Development		S	(+)	0.2423	0.370	0.052	0.4665	0.141	0.093	0.9544	0.090	0.126	0.5472	0.058	0.106
		H	(+)	0.3836	0.021	0.119	0.4361	0.023	0.125	0.5774	0.166	0.108	0.4586	0.021	0.128
B) Private Equity related indicators															
1) Banking system															
1.1 Size			(+)												
M2 to GDP		S	(+)	0.1215	0.160	0.046	-0.0100	0.924	-0.004	0.2596	0.132	0.061	0.1667	0.092	0.057
		H	(+)	-0.3225	0.000	-0.108	-0.3636	0.000	-0.112	-0.1106	0.548	-0.023	-0.2313	0.017	-0.069
Private credit to GDP		S	(+)	0.1565	0.102	0.069	0.3053	0.007	0.124	0.5342	0.003	0.146	0.3560	0.001	0.141
		H	(+)	0.1788	0.020	0.083	0.1857	0.034	0.080	0.1950	0.221	0.056	0.1464	0.109	0.061
1.2 Efficiency			(+)												
Return on assets		S	(+)	0.0004	0.520	0.010	-0.0002	0.860	-0.003	-0.0016	0.322	-0.025	-0.0003	0.713	-0.007
		H	(+)	-0.0001	0.773	-0.004	-0.0005	0.295	-0.018	0.0012	0.140	0.029	0.0004	0.452	0.014
Operating costs to total assets		S	(-)	-0.0002	0.341	-0.026	-0.0007	0.013	-0.081	0.0000	0.926	0.004	-0.0001	0.706	-0.012
		H	(-)	-0.0003	0.041	-0.048	-0.0004	0.058	-0.053	0.0003	0.471	0.028	-0.0002	0.411	-0.024
Net interest margin		S	(+)	0.1065	0.013	0.089	0.0994	0.079	0.077	0.0721	0.496	0.036	0.1370	0.003	0.103
		H	(+)	0.0518	0.080	0.055	0.0716	0.015	0.070	0.1516	0.007	0.101	0.0863	0.008	0.082
1.3 Competitiveness			(+)												
Interest rate spread		S	(+)	-0.0032	0.268	-0.021	-0.0018	0.583	-0.010	-0.0012	0.761	-0.004	-0.0024	0.340	-0.014
		H	(+)	0.0027	0.619	0.010	0.0000	0.995	0.000	0.0013	0.903	0.003	0.0032	0.637	0.010
Number of banks per GDP		S	(+)	0.0000	0.007	0.161	0.0000	0.017	0.155	0.0000	0.259	-0.088	0.0000	0.174	0.081
		H	(+)	0.0001	0.000	0.232	0.0000	0.019	0.127	0.0000	0.186	0.090	0.0001	0.007	0.140
2) Endowment-related variables															
2.1 Scientific competitiveness			(+)												
Engineers & scientists/('000)		S	(+)	0.0001	0.000	0.155	0.0001	0.000	0.141	0.0003	0.000	0.184	0.0002	0.000	0.192
		H	(+)	0.0001	0.002	0.122	0.0001	0.000	0.167	0.0001	0.278	0.054	0.0001	0.000	0.146
Patents residential	log	S	(+)	0.0515	0.078	0.099	0.0465	0.195	0.083	0.0588	0.220	0.071	0.0444	0.162	0.077
		H	(+)	0.0414	0.027	0.078	0.0419	0.067	0.072	0.0005	0.991	0.001	0.0203	0.362	0.034
Patents non residential	log	S	(-)	-0.0447	0.087	-0.053	-0.0421	0.161	-0.046	-0.0362	0.556	-0.026	-0.0604	0.056	-0.065
		H	(-)	0.0087	0.723	0.010	-0.0394	0.164	-0.042	-0.1250	0.047	-0.086	-0.0561	0.077	-0.058
2.2 Corporate eco. conditions			(+)												
GDP per capita	log	S	(+)	0.0570	0.824	0.020	-0.3305	0.306	-0.107	-0.0196	0.972	-0.004	-0.0177	0.952	-0.006
		H	(+)	-0.1520	0.446	-0.076	-0.2897	0.206	-0.133	-0.0789	0.858	-0.024	-0.2046	0.370	-0.092
Wages in countries	log	S	(+)	-0.0058	0.964	-0.003	0.0610	0.702	0.031	-0.5797	0.019	-0.191	-0.1517	0.303	-0.075
		H	(+)	0.1684	0.104	0.134	0.1715	0.128	0.125	0.4798	0.035	0.231	0.3188	0.007	0.227
Corporate tax rates		S	(-)	-0.0166	0.007	-0.104	-0.0267	0.000	-0.155	-0.0437	0.000	-0.170	-0.0279	0.000	-0.158
		H	(-)	-0.0121	0.010	-0.076	-0.0138	0.010	-0.080	-0.0351	0.005	-0.133	-0.0143	0.012	-0.081
2.3 Exit possibilities			(+)												
Stock market capitalization	log	S	(+)	0.0836	0.002	0.129	0.0654	0.031	0.093	0.2816	0.000	0.270	0.0912	0.006	0.127
		H	(+)	0.0471	0.068	0.079	0.0378	0.151	0.058	-0.0741	0.224	-0.077	-0.0128	0.651	-0.019
3) Institutional/ legal/ political															
3.1 Institut. stability & quality			(+)												
Rule of law		S	(+)	0.1558	0.537	0.063	0.3611	0.276	0.135	-0.3408	0.488	-0.084	0.1003	0.729	0.037
		H	(+)	0.6967	0.001	0.380	0.7219	0.002	0.363	0.5558	0.200	0.183	0.8098	0.000	0.397
Political stability		S	(+)	-0.4835	0.000	-0.211	-0.4675	0.000	-0.188	-0.8893	0.000	-0.237	-0.5580	0.000	-0.218
		H	(+)	-0.6512	0.000	-0.356	-0.6337	0.000	-0.319	-0.4155	0.005	-0.141	-0.5731	0.000	-0.281
Regulatory quality		S	(+)	0.5254	0.001	0.194	0.6305	0.001	0.214	0.8101	0.020	0.182	0.6125	0.001	0.203
		H	(+)	0.0280	0.837	0.013	-0.1026	0.534	-0.044	0.6087	0.039	0.171	0.1866	0.261	0.077
Control of corruption		S	(+)	0.0650	0.734	0.034	-0.2136	0.381	-0.103	0.6383	0.101	0.202	0.1117	0.613	0.053
		H	(+)	-0.2517	0.068	-0.175	-0.3628	0.023	-0.232	-0.4733	0.141	-0.199	-0.5156	0.001	-0.321
3.2 Legal regimes and origin															
Common law		S		0.3739	0.001	0.155	0.5640	0.000	0.215	0.4400	0.033	0.113	0.5838	0.000	0.218
		H		0.0091	0.926	0.004	-0.0006	0.995	0.000	-0.2231	0.314	-0.055	-0.0903	0.428	-0.032
Civil law		S		0.0378	0.628	0.015	0.1415	0.160	0.053	0.1304	0.326	0.032	0.1411	0.110	0.051
		H		0.0297	0.671	0.012	0.0555	0.489	0.021	-0.1360	0.409	-0.033	0.0224	0.790	0.008
3.3 Freedom			(+)												
Political rights		S	(-)	-0.1267	0.055	-0.145	-0.1122	0.174	-0.118	-0.1890	0.105	-0.135	-0.1681	0.021	-0.172
		H	(-)	0.1264	0.008	0.149	0.1116	0.049	0.121	0.0676	0.521	0.048	0.1576	0.008	0.167
Civil rights		S	(-)	0.2057	0.000	0.194	0.2115	0.003	0.183	-0.0397	0.721	-0.023	0.1566	0.017	0.132
		H	(-)	-0.0613	0.218	-0.064	-0.0809	0.165	-0.078	-0.0672	0.555	-0.043	-0.1081	0.070	-0.102
Economic freedom		S	(+)	-0.0063	0.401	-0.045	-0.0007	0.938	-0.005	-0.0214	0.158	-0.094	-0.0143	0.093	-0.092
		H	(+)	0.0099	0.117	0.073	0.0198	0.004	0.134	-0.0079	0.555	-0.035	0.0140	0.064	0.092

The models are statistically significant, with an increase of R-squared to 52% for participation, 43% for deal participation, 38% for deal flow, and 47% for activity.

A. The gravity model indicators are:

A.1) Economic mass: The economic mass indicator **population** is significant and positive-related for all models. **GDP per capita** is not significant.

A.2) Economic distance: Variables that are significant for all models are **geographic distance** and **common language,** with the indicated sign, whereas **common currency** is significant for all models, although with inverse signs to economic similarity. Partially significant is the variable **common legal system** for participation and deal participation, with the indicated sign.

A.3) Country pair: There are several variables relevant in this section. First is the **exchange rate** of host country in the deal flow model, verifying the propensity of investment toward low-exchange-rate countries. **Openness to import-export** of the source country is positive for deal flow and activity and positive for host in the deal participation model. It indicates that export- and import-oriented countries have increased deal activity. Country **development** is important for the host country to attract foreign investors. The variable is significant for participation, deal participation, and activity.

B. Private equity-related indicators

B.1) Banking system: The indicators for size of the banking system — **M2 to GDP** and **private credit to GDP** — are, with exceptions, statistically significant for VC investment. M2 to GDP has a negative impact for the host country in participation, deal participation, and activity. The coefficients for private credit to GDP are positive for deal participation, deal flow, and activity for source, and for participation and deal participation for host, confirming the beneficial impact of banking system size on VC cross-border deals.

Banking efficiency: The indicator **return on assets** is not significant. **Operating costs to total assets** is significant and negative-related for source country in deal participation and for host country in participation. The variable **net interest margin** has positive coefficients for the models participation and activity in source country and for host countries for deal participation, deal flow, and activity. Both variables support the assumption that countries with efficient banking systems have increased cross-border investment activity.

The indicators for **bank competitiveness** are **interest rate spread** and **number of banks per GDP**. The variable interest rate spread is not significant. The **number of banks** indicator covers participation and deal participation for source and host, and in the activity model for host. It shows that increased competition in the banking system supports cross-border investment.

B.2) Endowment-related variables: The indicators for **scientific competitiveness** are **engineers and scientists,** and **patents residential** and **nonresidential.** Engineers and scientists indicate positive impact of country endowment for investment in all models for source, and for all models except deal flow in host. The variable patents residential is significant for host in the model participation. It indicates a focus on countries with a high level of patent applications, which is a main stimulant for seed and startup investment. The patents nonresidential variable is significant, with the expected negative coefficient in the deal flow model. **Corporate economic conditions** are viewed through the variables of **GDP per capita** (previously described as an economic mass indicator), **wages**, and **corporate tax rates**.

Wages are significant and positive-related in the host country for deal flow and activity, but negative-related for deal flow in the source country. This factor verifies that host countries are more attractive if they have a skilled labor force.

Corporate tax rates are significant, with negative coefficients for all models and a larger coefficient for source countries; high corporate tax rates seem to hinder cross-border transactions.

In **exit possibilities, stock market capitalization** indicates the country conditions for taking a company public. This variable demonstrates its significance for all models in source, and the attracting influence of large stock markets for investment abroad.

B.3) Institutional legal and political: The general environment is analyzed according to a country's institutional stability and quality, legal regime, and freedom.

The **rule of law** is significant for host country for participation, deal participation, and activity, and verifies the impact of high quality in the rules of society and the

judicial system for cross-border deals.[215] The coefficients for **political stability** are negative for all models, indicating the tendency of countries to invest into less stable political countries.

Regulatory quality is significant for source country in all models, and for host in the deal flow model, with a positive coefficient. The variable proves that governmental permission and promotion of private sector development is fundamental to healthy cross-border investment, especially for large investment.

The results for **control of corruption** verify a negative correlation between investment abroad and the control of corruption for host country in deal participation and activity, indicating that investment is made into countries with less control of corruption. The indicators for **legal regime** prove the effect of the origin of the legal system on cross-border transactions. **Common law** coefficients for source country signify a positive correlation to cross-border investment for all models. **Civil law** is not significant. Overall, the coefficients verify that a common law system encourages VC investors to provide money for cross-border transactions.

The **freedom** variables — civil rights, and political and economic freedom — describe a country's general liberties. **Political rights** is significant in source country for activity with a positive impact on cross-border activity. It is negative-related for participation, deal participation, and activity in source country. **Civil rights** is significant, with negative impact for source in participation, deal participation, and activity.

The last indicator, **economic freedom** is significant for host country in deal participation.

The analysis with the full set of variables has much similarity with the overall analysis, proving the effects of the gravity model assumptions.

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[215] **Kaufmann; Kraay and Mastruzzi,** Governance Matters 2007 Worldwide Governance Indicators, 1996-2006, p. 4.

4.3.2.2.   Private equity investment

The PE analysis investigates the determinants of advanced company stages, especially buyouts. The general equations of the regressions are listed in the overall analysis. The details of the gravity model indicator analysis are:

Table 33: Results with gravity model indicators (PE)

Gravity model analysis Private Equity Indicators	log	Source Host		Participation Numberofobs=1167 F(31,1135)=18.41 Prob>F=0 R-squared=0.3681 RootMSE=0.82193			Deal participation Numberofobs=1167 F(31,1135)=9.04 Prob>F=0 R-squared=0.2045 RootMSE=1.016			Dealflow Numberofobs=992 F(31,960)=13.53 Prob>F=0 R-squared=0.3136 RootMSE=1.6414			Activity % Numberofobs=1167 F(31,1135)=13.99 Prob>F=0 R-squared=0.3078 RootMSE=1.0038		
A) Gravity model indicators				Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
1) Economic mass			(+)												
Population	log	S	(+)	**0.3173**	0.000	0.477	**0.2552**	0.000	0.348	**0.7213**	0.000	0.574	**0.3849**	0.000	0.496
		H	(+)	**0.3099**	0.000	0.477	**0.2564**	0.000	0.358	**0.4322**	0.000	0.349	**0.3213**	0.000	0.423
2) Economic distance			(-)												
Distance	log		(-)	-0.0481	0.148	-0.057	-0.0530	0.218	-0.057	**-0.2134**	0.005	-0.132	**-0.1206**	0.004	-0.123
Factors eco. distance:			(+)												
Common language			(+)	**0.2176**	0.003	0.092	**0.2709**	0.002	0.104	**0.5312**	0.001	0.120	**0.3507**	0.000	0.127
Common border			(+)	-0.0401	0.697	-0.015	-0.0841	0.514	-0.028	**-0.5764**	0.009	-0.109	**-0.2643**	0.034	-0.084
Common history			(+)	0.1210	0.373	0.026	0.0941	0.554	0.018	0.2709	0.297	0.031	0.1575	0.335	0.029
Common currency			(+)	**-0.6047**	0.000	-0.119	**-0.6708**	0.000	-0.120	**-1.0448**	0.000	-0.099	**-0.7405**	0.000	-0.125
Common legal system			(+)	0.0822	0.228	0.039	0.1214	0.142	0.053	0.2464	0.105	0.061	0.1117	0.171	0.046
3) Country pair specific															
Exchange rates		S	(+)	**-0.0073**	0.014	-0.074	**-0.0086**	0.025	-0.079	-0.0078	0.184	-0.040	**-0.0082**	0.022	-0.071
		H	(-)	-0.0001	0.959	-0.001	0.0048	0.067	0.051	-0.0004	0.937	-0.002	0.0012	0.669	0.012
Openness of im- and exports to GDP		S	(+)	**0.2092**	0.000	0.132	0.1232	0.060	0.071	**0.5241**	0.000	0.172	**0.2302**	0.000	0.125
		H	(+)	-0.0412	0.374	-0.023	0.0416	0.462	0.021	0.1701	0.149	0.048	0.0723	0.262	0.034
Development		S	(+)	**0.5301**	0.035	0.085	0.3103	0.369	0.045	**0.8865**	0.048	0.073	0.4951	0.095	0.068
		H	(+)	0.0995	0.497	0.035	-0.0026	0.989	-0.001	-0.6646	0.071	-0.118	-0.1260	0.508	-0.038
2) Endowment-related variables															
GDP per capita	log	S	(+)	**0.5276**	0.001	0.163	**0.6003**	0.002	0.169	**1.0293**	0.000	0.167	**0.7401**	0.000	0.196
		H	(+)	**0.6650**	0.000	0.372	**0.4178**	0.000	0.212	**1.2492**	0.000	0.353	**0.7049**	0.000	0.338

For PE investment, all models are statistically significant, with **1,167** observations for participation, deal participation, and activity, and **992** observations for deal flow. Participation explains 37% of the data variation; deal participation, 21%; deal flow, 31%; and activity, 31%.

1) Economic mass: The economic mass indicators **population** and **GDP per capita** are significant for all models, as in the previous gravity model-derived indicator analysis. Population has the largest effect for source in deal flow, indicated by a beta coefficient of 0.574.

2) Economic distance: The economic distance indicators are different compared to the previous models. Conspicuously, **geographic distance** is significant only for deal flow and activity. **Common history** and **common legal system** are not significant at all. **Common language** is a dominant factor to increase the propensity for cross-border investment. **Common currency** is significant for all models, though with a negative coefficient. **Common border** signifies a contrary impact for deal flow and activity percentage transactions.

3) Country pair: The country pair section verifies the significance of the variables for source country. Likewise, **exchange rate** is negative-related to cross-border participation, deal participation, and activity in the source country. **Openness of imports-exports** of the source country is positive for participation, deal flow, and activity. Country **development** is significant for participation and deal flow, with a positive coefficient. The regression analysis for PE investment deals verifies the gravity model theory of country mass increasing cross-border investment, whereas economic distance reducing the effect is limited to the variable common language for all dependent variables, and geographic distance for deal flow and activity.

The gravity model analysis with the full-set of determinants for PE deals is presented in Table 34:

Table 34: Results of gravity model and private equity-related indicators (PE)

Gravity model analysis Private Equity	log	Source Host		Participation Numberofobs=1167 F(75,1091)=13.26 Prob>F=0 R-squared=0.505 RootMSE=0.74196			Deal participation Numberofobs=1167 F(75,1091)=8.5 Prob>F=0 R-squared=0.3588 RootMSE=0.93045			Dealflow Numberofobs=992 F(75,916)=8.86 Prob>F=0 R-squared=0.3996 RootMSE=1.5716			Activity % Numberofobs=1167 F(75,1091)=10.22 Prob>F=0 R-squared=0.4432 RootMSE=0.91826		
A) Gravity model indicators				Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
1) Economic mass			(+)												
Population	log	S	(+)	0.0340	0.795	0.051	0.0287	0.871	0.039	0.5555	0.074	0.442	0.0472	0.771	0.061
		H	(+)	**0.2653**	0.004	0.408	**0.2975**	0.011	0.415	**0.8754**	0.000	0.708	**0.4278**	0.000	0.564
2) Economic distance			(-)												
Distance	log		(-)	**-0.2712**	0.000	-0.322	**-0.2993**	0.000	-0.323	**-0.6029**	0.000	-0.373	**-0.3638**	0.000	-0.370
Factors eco. distance:			(+)												
Common language			(+)	0.0827	0.326	0.035	0.0234	0.830	0.009	0.1782	0.342	0.040	0.1377	0.176	0.050
Common border			(+)	-0.1250	0.217	-0.046	-0.1704	0.196	-0.057	**-0.6203**	0.013	-0.117	**-0.3177**	0.012	-0.101
Common history			(+)	0.1469	0.254	0.031	0.1209	0.435	0.023	0.1226	0.655	0.014	0.1476	0.359	0.027
Common currency			(+)	**-0.3937**	0.001	-0.077	-0.3511	0.052	-0.063	**-0.7675**	0.028	-0.073	**-0.4650**	0.006	-0.078
Common legal system			(+)	**0.1588**	0.028	0.076	**0.2205**	0.016	0.095	**0.3980**	0.024	0.098	**0.2003**	0.023	0.082
3) Country pair specific															
Exchange rates		S	(+)	-0.0009	0.812	-0.009	-0.0019	0.720	-0.017	0.0060	0.472	0.031	0.0017	0.716	0.015
		H	(-)	-0.0008	0.762	-0.009	0.0010	0.730	0.011	0.0035	0.619	0.021	0.0004	0.902	0.004
Openness of im- and exports to GDP		S	(+)	**0.4077**	0.001	0.257	0.2228	0.199	0.128	0.4886	0.065	0.161	**0.3803**	0.012	0.206
		H	(+)	-0.0270	0.776	-0.015	0.1393	0.230	0.070	0.0356	0.878	0.010	0.1350	0.258	0.064
Development		S	(+)	**1.0632**	0.010	0.170	**1.0794**	0.041	0.157	0.5777	0.492	0.047	**1.0311**	0.038	0.142
		H	(+)	0.2090	0.360	0.074	0.3081	0.272	0.099	0.3398	0.566	0.060	0.3741	0.182	0.114
B) Private Equity related indicators															
1) Banking system															
1.1 Size			(+)												
M2 to GDP		S	(+)	**-0.4082**	0.000	-0.175	**-0.5918**	0.000	-0.230	-0.1671	0.500	-0.037	**-0.3929**	0.006	-0.144
		H	(+)	**-0.2816**	0.005	-0.109	**-0.3908**	0.002	-0.138	-0.2525	0.357	-0.049	**-0.3794**	0.002	-0.126
Private credit to GDP		S	(+)	0.2071	0.101	0.113	0.1907	0.262	0.095	-0.0285	0.921	-0.008	0.2048	0.183	0.096
		H	(+)	0.0861	0.419	0.049	0.0271	0.833	0.014	0.0308	0.898	0.009	0.1743	0.178	0.084
1.2 Efficiency			(+)												
Return on assets		S	(+)	**-0.0007**	0.026	-0.013	0.0004	0.372	0.008	-0.0004	0.643	-0.004	-0.0002	0.587	-0.004
		H	(+)	-0.0001	0.862	-0.004	0.0001	0.840	0.006	-0.0004	0.794	-0.011	0.0001	0.846	0.005
Operating costs to total assets		S	(-)	-0.0001	0.838	-0.007	-0.0003	0.451	-0.035	0.0000	0.948	-0.003	-0.0001	0.728	-0.013
		H	(-)	-0.0002	0.340	-0.035	-0.0003	0.154	-0.056	0.0010	0.050	0.111	0.0000	0.883	0.007
Net interest margin		S	(+)	0.0730	0.309	0.068	0.0778	0.387	0.066	0.0825	0.645	0.039	0.0906	0.301	0.073
		H	(+)	-0.0707	0.092	-0.071	-0.0244	0.618	-0.022	0.1130	0.288	0.060	-0.0364	0.485	-0.031
1.3 Competitiveness			(+)												
Interest rate spread		S	(+)	**0.0174**	0.016	0.062	**0.0226**	0.007	0.074	-0.0063	0.777	-0.008	**0.0169**	0.034	0.052
		H	(+)	0.0066	0.449	0.025	0.0036	0.741	0.012	0.0122	0.350	0.025	0.0087	0.266	0.028
Number of banks per GDP		S	(+)	0.0000	0.664	0.042	0.0000	0.411	0.093	0.0000	0.772	-0.040	0.0000	0.620	0.052
		H	(+)	**0.0001**	0.006	0.206	0.0000	0.162	0.114	0.0000	0.969	0.004	0.0000	0.564	0.043
2) Endowment-related variables															
2.1 Scientific competitiveness			(+)												
Engineers & scientists/('000)		S	(+)	**0.0001**	0.005	0.152	**0.0001**	0.028	0.137	**0.0003**	0.004	0.157	**0.0001**	0.006	0.147
		H	(+)	0.0001	0.112	0.081	0.0001	0.108	0.091	0.0000	0.696	0.026	**0.0001**	0.038	0.114
Patents residential	log	S	(+)	0.0418	0.332	0.095	0.0420	0.434	0.087	0.0441	0.625	0.050	0.0631	0.232	0.123
		H	(+)	-0.0098	0.680	-0.022	0.0058	0.841	0.012	-0.0474	0.490	-0.054	-0.0007	0.980	-0.001
Patents non residential	log	S	(-)	**-0.1088**	0.002	-0.138	-0.0851	0.070	-0.098	-0.0801	0.409	-0.039	-0.0676	0.095	-0.073
		H	(-)	-0.0552	0.065	-0.079	-0.0542	0.123	-0.071	-0.0882	0.324	-0.058	-0.0451	0.209	-0.056
2.2 Corporate eco. conditions			(+)												
GDP per capita	log	S	(+)	-0.3468	0.367	-0.107	-0.5677	0.253	-0.160	0.9540	0.309	0.155	-0.3803	0.442	-0.101
		H	(+)	0.1070	0.684	0.060	-0.2155	0.503	-0.109	**1.6205**	0.032	0.457	0.1736	0.602	0.083
Wages in countries	log	S	(+)	-0.2850	0.212	-0.132	-0.2308	0.461	-0.097	-0.4828	0.337	-0.115	-0.3251	0.254	-0.129
		H	(+)	0.1390	0.329	0.122	**0.3539**	0.038	0.281	0.0170	0.967	0.008	0.2304	0.197	0.173
Corporate tax rates		S	(-)	-0.0133	0.105	-0.094	**-0.0255**	0.023	-0.163	-0.0180	0.318	-0.064	-0.0177	0.079	-0.107
		H	(-)	-0.0054	0.401	-0.039	-0.0003	0.967	-0.002	-0.0264	0.090	-0.098	-0.0029	0.704	-0.019
2.3 Exit possibilities			(+)												
Stock market capitalization	log	S	(+)	**0.3077**	0.000	0.533	**0.2394**	0.040	0.376	0.2134	0.274	0.196	**0.3054**	0.002	0.453
		H	(+)	0.0263	0.638	0.049	-0.0361	0.610	-0.061	-0.2398	0.114	-0.237	-0.0750	0.276	-0.119
3) Institutional/ legal/ political															
3.1 Institut. stability & quality			(+)												
Rule of law		S	(+)	0.2124	0.577	0.074	0.3218	0.482	0.102	-0.8152	0.326	-0.140	0.1463	0.754	0.044
		H	(+)	**0.9925**	0.000	0.611	**1.0760**	0.000	0.601	**1.7052**	0.032	0.534	**1.1904**	0.000	0.628
Political stability		S	(+)	**-0.2707**	0.015	-0.133	-0.2362	0.104	-0.105	**-0.7627**	0.008	-0.195	**-0.3560**	0.008	-0.149
		H	(+)	**-0.4814**	0.000	-0.295	**-0.3975**	0.000	-0.221	**-0.7316**	0.001	-0.236	**-0.4922**	0.000	-0.258
Regulatory quality		S	(+)	0.3986	0.066	0.137	0.3170	0.271	0.099	**0.9494**	0.046	0.172	0.4288	0.099	0.126
		H	(+)	-0.0290	0.834	-0.015	-0.1373	0.394	-0.064	0.0247	0.950	0.007	0.0808	0.639	0.035
Control of corruption		S	(+)	**-0.5966**	0.029	-0.283	-0.6397	0.062	-0.275	-0.0932	0.873	-0.023	-0.5570	0.091	-0.226
		H	(+)	**-0.3301**	0.023	-0.255	**-0.4721**	0.005	-0.331	-0.5197	0.334	-0.205	**-0.6343**	0.000	-0.420
3.2 Legal regimes and origin															
Common law		S		**-0.3548**	0.036	-0.174	-0.2748	0.215	-0.122	-0.0746	0.849	-0.019	-0.1681	0.437	-0.071
		H		0.1906	0.117	0.090	**0.3007**	0.035	0.129	-0.0595	0.835	-0.015	0.2069	0.153	0.084
Civil law		S		**-0.2765**	0.018	-0.123	-0.2298	0.157	-0.093	-0.3881	0.103	-0.088	-0.2500	0.073	-0.095
		H		**0.2019**	0.016	0.097	**0.2292**	0.026	0.099	-0.1440	0.494	-0.036	**0.2215**	0.031	0.091
3.3 Freedom			(+)												
Political rights		S	(-)	**-0.3152**	0.000	-0.321	**-0.2556**	0.031	-0.237	-0.1047	0.576	-0.052	**-0.2584**	0.016	-0.226
		H	(-)	0.1012	0.093	0.135	**0.1420**	0.045	0.173	**0.5075**	0.001	0.348	**0.2138**	0.003	0.245
Civil rights		S	(-)	0.0634	0.354	0.055	0.0851	0.345	0.066	-0.1433	0.358	-0.065	0.0104	0.901	0.008
		H	(-)	0.0496	0.410	0.058	0.0626	0.399	0.067	-0.2515	0.119	-0.152	-0.0397	0.592	-0.040
Economic freedom		S	(+)	**0.0240**	0.016	0.177	**0.0410**	0.005	0.274	0.0247	0.291	0.092	**0.0293**	0.019	0.185
		H	(+)	0.0004	0.957	0.004	0.0060	0.510	0.046	-0.0056	0.754	-0.025	0.0039	0.666	0.028

The models are statistically significant, with an increase of explained variance of 50% for participation, 36% for deal participation, 40% for deal flow, and 44% for activity.

A) Gravity model indicators:

A.1) Economic mass: The economic mass indicator **population** is significant and positive-related for host in all models, indicating that the economic mass of the host country attracts foreign PE investment, whereas mass is insignificant for source. **GDP per capita** is significant and positive for host in deal flow, verifying the mass assumption, especially for large-dollar-amount deals.

A.2) Economic distance: The variables that are significant, with the indicated sign, are **geographic distance** and **common legal system**. **Common currency** is significant for participation, deal flow, and activity, but with inverse signs to the assumption of economic similarity. Common border is negative for deal flow and activity. Common language and history are not significant.

A.3) Country pair: The significant variables are **openness of import-export** of the source country and the **development** of the source country. The indicator **openness of import-export** has positive coefficients for participation and activity percentage. The development of the source country is significant, with a positive effect for participation, deal participation, and activity.

B) Ptivate equity-related indicators:

B.1) Banking system: The indicators for **size** of the banking system **M2 to GDP** are significant for source and host for participation, deal participation, and activity percentage with negative coefficients. **Private credit to GDP** is not significant.

Banking efficiency: The indicator **return on assets** is significant for participation with a negative sign. **Operating costs to total assets** and **net interest margin** are not significant, indicating that banking efficiency does not have a large impact on cross-border transactions. **Bank competitiveness:** The indicators for bank competitiveness are **interest rate spread** and **number of banks per GDP**, whereas the variable interest rate spread is not significant and the number of banks per GDP indicator is significant only for the participation model for host.

B.2) Endowment-related variables: The indicators for **scientific competitiveness** are **engineers and scientists,** and **patents residential** and

nonresidential. Scientists and engineers relates to source in all models, and to host country in activity, with positive effects for investment.

Patents residential is not significant, whereas **patents nonresidential** indicates that source countries with fewer foreign patent applications tend toward increased investment abroad.

Corporate economic conditions are investigated with the variables of **GDP per capita** (which was mentioned as a mass indicator), **wages**, and **corporate tax rates**. **Wages** are significant and positive-related in host country for deal participation. **Corporate tax rates** are significant with negative coefficients for source country for deal participation.

In the **exit possibilities** category**,** the variable **stock market capitalization** shows a positive impact in participation, deal participation, and activity for source in cross-border deals.

B.3) Institutional legal and political: The **rule of law** is significant for host country for all models, and verifies the similarity of results in the VC investment analysis. The coefficients for **political stability** are significant for host in all models, and significant for source in participation, deal flow, and activity, with a negative sign.

Regulatory quality is significant for source country in deal flow, with a positive coefficient.

Control of corruption displays a negative correlation between cross-border investment and for host country in participation, deal participation, and activity, as well as for source in participation.

The **legal regime** indicator **common law** is significant for participation for source, with a negative, and for host in deal participation, with a positive effect on PE transactions. **Civil law** is significant for source for participation, with a negative, and significant with a positive indication for host in participation, deal participation, and activity.

Of the **freedom variables,** the indicator for **political rights** is significant for participation, deal participation, and activity for host, with a positive impact, and for host with a negative impact for deal participation, deal flow, and activity. The indicator **civil rights** is not significant. **Economic freedom** is significant for participation, deal participation, and activity for source.

The analysis with the full set of variables supports partially the traditional gravity model indicators of mass and distance, whereas the economic mass of the source country does not seem to have a major effect.

4.3.3. Comparison and conclusion of analytic interpretation

The gravity model analysis reveals the impact of country affinity, with the gravity indicators and the PE indicators further broken down into VC and PE activity. The results are compared with focus on the activity as a percentage for overall VC and PE. See Table 35.

Table 35: Comparison of analytic results

The results from the analysis imply that the impact of the environmental indicators is predominantly valid and that the underlying gravity model functions appropriately.

A) Gravity model indicators

1. Economic mass: Empirical analysis verifies the assumption that the economic mass of countries intensifies the propensity for cross-border investment and that the hypothesis $H_{GM\ 1EM}$ can be valid for overall investment and VC investment. It can also be valid for the host in PE if population as mass indicator is taken into account. The results show that for PE investment the mass of the source country is not a crucial factor for cross-border activity, whereas for VC investment, source country size is decisive, though with less impact than host, as verified by the beta coefficients.

2. Economic distance: The empirical results prove the impact of economic distance, with an inconsistent result for VC and PE investment. The hypothesis of H_{GM_2ED} can be proved for **geographic distance,** reducing the likelihood of cross-border investment between countries for overall, VC, and PE investment, with a relative high beta coefficient. This hypothesis further verifies the indicator **common language** for overall and VC investment; for PE investment the hypothesis must be rejected. The indicator **common border** is significant but negative for PE, and **common currency** is significant but negative-related for all models, resulting in a rejection of the hypothesis H_{GM_2ED}. **Common legal system,** however, is significant for PE investment. Overall, the beta coefficients of the main indicators **geographic distance** and **language** verify that reduced economic distance and cultural affinity enhance the propensity toward cross-border transactions.

3. Country pair: Empirical analysis indicates an increase of cross-border activity toward countries with lower **exchange rates** for VC, so that the hypothesis H_{GM_3ER} is proved for VC. The result indicates that investors consider differences in currency value as additional investment incentive.

The **openness** of a country toward international trade explains a large portion of the variance for source in all models. The hypothesis H_{GM_3OP} is proved. The results indicate that greater international trade increases the propensity for countries to invest abroad and lowers entrance barriers.

The results of country **development** verify a significant positive coefficient for the overall model, for host in VC, and for source in PE (generally, a proof of H_{GM_3DM}). The results indicate a positive coherence of the economic maturity of countries and cross-border investment, where a high level of development is key for VC into, and for PE from, those countries.

B) Private equity indicators

1. Banking system indicator: The hypothesis for cross-border activity assumes a well-funded financial system. Empirical results document that **private credit to GDP** provides a positive indication for **size of the banking system** for source country for overall investment and VC, which results in the proof of H_{PE_1FS} for this indicator. However, the **M2 to GDP** for all host countries and for the source in PE activity is significant, but negative, which leads to the rejection of the hypothesis. Empirical results for **efficiency of banking system** verify that the **net interest margin** of banks, considered similar to the gross margin of nonfinancial companies, is significant for source and host countries in the overall and VC models. The hypothesis $H_{PE\ 1FE}$ can be proved for this indicator, whereas for the remaining indicators, and especially for PE activity, the hypothesis must be rejected. It can thus be concluded that banking efficiency is relevant to VC investment.

The results of the **competitiveness of banking system** have significant positive coefficients for overall and VC investment for host country in the **number of banks per GDP,** which leads to the proof of $H_{PE\ 1FC}$, indicating increased cross-border VC activity toward countries with a general high density of banks compared to economic activity. The indicator **interest rate spread** in the source of PE investment shows a larger gap between lending and deposit rates, verifying $H_{PE\ 1FC}$ for PE investment.

2. Endowment-related indicators: The hypothesis for cross-border activity assumes a high level of specified corporate conditions in a country.

The results confirm that **scientific competitiveness** has an impact on cross-border deals, with the indicator **engineers and scientists** being significant for all models, proving $H_{PE\ 2SC}$. The indicators **patents residential** and **nonresidential** are not significant in the activity models. Overall, it can be concluded that scientific competitiveness is a crucial factor for both source and host country for cross-border investment, as indicated in the models.

The analytic results for **corporate economic conditions** validate that the level of qualification of the workforce measured in average **wages** is significant for overall investment and the VC model in the host country, proving H_{PE_2EC}. The indicator of **GDP per capita** is not significant. The corporate tax burden, indicated by highest **corporate tax rate,** has a significant impact on cross-border activity for overall investment and VC models, which leads to the proof of H_{PE_2EC}. Corporate economic conditions are not significant for PE.

Empirical results for **exit possibilities** signify a large impact on the source country for cross-border investment. Exit possibilities are represented by **stock market capitalization**. It measures the value of all stocks listed on an exchange, indicating the attractiveness for IPOs in a country. The hypothesis of H_{PE_2EP} is proved for the source countries with large coefficients, especially for PE investment with a beta of 0.453.

3. Institutional / legal / political conditions: The assumption is that high standards of environmental conditions foster cross-border transactions.

Institutional stability and quality has a crucial impact on cross-border transactions. The **rule of law** — measuring the extent to which agents have confidence in the rules of society, in particular the quality of courts and contract enforcement — is significant for host countries for all models, with a high beta coefficient, proving H_{PE_3SQ}. The effect indicates that investors prefer target companies in countries with high standards for the rule of law.

Political stability evaluates the likelihood that a government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism. The coefficient is significant but negative for all models, resulting in the rejection of H_{PE_3SQ}. The indicator has a large impact because of the largest cross-border countries, the US and the UK, having a relatively volatile level of political stability because of the terrorism threat.

Regulatory quality — measuring the ability of the government to formulate and implement regulations that permit and promote private sector development — has a great impact in source countries for overall investment and VC investment, proving the hypothesis H_{PE_3SQ} for the corresponding models. The result identifies that high regulatory quality is crucial for investors going abroad.

Control of corruption measures the extent to which public power is exercised for private gain. This indicator is significant but negative for host countries for all

models, which leads to the rejection of H_{PE_3SQ}. The results indicate the attraction of cross-border investment by countries with less control of corruption. The interpretation must assume that the US, as major host country, has a relatively high level of corruption control, although it is lower than that of the UK, France, and Germany, for example, which are main investors into the US.

The empirical results for **legal regimes and origin** indicate that the **common law** system in source countries explains a portion of the variance for overall and VC investment. The coefficient demonstrates a positive effect for the civil law system for PE cross-border deals in a host country. The hypothesis H_{PE_3LO} is therefore proved.

Freedom, as the opportunity to act spontaneously outside the control of the government and other centers of potential domination, with the broad categories of political rights, civil liberties, and economic freedom, is relevant for cross-border investment. **Political rights** are significant for source countries in all models, so H_{PE_3FR} is proved. For host countries, the indicator is significant though with a negative sign, which leads to the rejection of the hypothesis H_{PE_3FR} for host countries. The result verifies that cross-border transactions are initiated from high standard countries that enable people to participate freely in the political process, vote freely for distinct alternatives in legitimate elections, and elect representatives who have a decisive impact on public policies toward countries.

Civil rights measure the freedoms of expression and belief, and personal autonomy, without interference from the state. The indicator is significant, but negative-related in VC investment, so that H_{PE_3FR} must be rejected.

Comparison of the results shows that the specific categories have different impacts on the country pair affinity for overall, VC, and PE investment. For VC, more indicators are relevant, and it can be concluded that PE is mainly affected by the general country pair configuration, analyzed with the gravity model and the environmental model of institutional, legal, and political indicators.

D. Summary and implications

1. Summary of research results

The highly volatile private equity industry is home to thousands of firms all over the world seeking to invest not only in their domestic markets, but increasingly in countries abroad. As this global PE activity continues to intensify, so too will competition between firms. Moreover, differences in social, cultural, legal, and economic norms and values will impact the relative success of cross-border deals.

Industry pressure to strike cross-border deals necessitate an understanding of the patterns and conventions of transnational investment. This pressure also increases the need to comprehend the forces driving the PE market and to identify their effect on the affinity between countries for deal sourcing abroad.

The requirements for PE cross-border initiatives are only partly illuminated by scientific discussion. Current studies either evaluate the propensity for PE investment of specific countries or analyze foreign direct investment without explicitly mentioning PE activity. Academic literature has shown a dearth in coverage of several necessary areas, including explicit investigation of PE cross-border activity and relevant intercountry relationships.

The goal of this dissertation is to provide a scientific analysis based on a comprehensive theoretical foundation. Theory-guided hypotheses with determinants of interaction between countries are derived and validated by the quantitative application of the gravity model.

To evaluate the transaction patterns across countries, **244,461** deals between funds and PF companies are analyzed from **99** different countries during the years 1980 through 2005, covering **7,475** management firms, **14,668** different funds, and **51,346** different PF companies with detailed deal information.

The heterogeneous **research subjects** of PE are defined by exploring the PE market environment. Descriptions of the company life cycle, the finance stages of a company, and the business process are provided to explain the roles of the various PE participants and their relationships.

The next central element is the development of the PE **research framework** which outlines the goal of analyzing intercountry effects over time, of defining

activity between countries, and of deriving analytical determinants. The method-related studies of the **gravity model**, which covers interaction between countries, and the **panel data model**, which shows development over time, lay the foundation for how countries interact over time and support the design of the regression analyses with fixed effects. To simplify the complexity of PE for the gravity model, economic foundations and institutional structures are used to systematize the PE market and organize the participants in relationships, structure the processes of PE deals, and assess the company life cycle by finance stages for investment. Topic-related studies of PE investment, combined with traditional cross-border trade flow analysis, support the generation of the hypotheses and the derivation of determinants for empirical analysis.

Special attention was devoted to accurately conceptualize and quantify country PE **activity**. This is necessary due to the immense complexity of PE investments on a global basis. The construct *activity* is developed by arranging investor and target company in relation to their particular engagement in a deal at a certain point in time. To quantify activity, a new method is developed to structure and aggregate deals from a firm-level to a country-level over time. The framework then places countries in a defined relationship with the source and host of a deal interacting over time.

The research framework confirms the need to examine four *measurable* variables for PE–specific, multi-investor deals: participation, deal participation, deal flow, and percent of activity. Comprehensive PE cross-border activity analysis requires viewing countries through three investment perspectives as source, as host, and as source and host combined in an overall view. This perspective is expanded by the geographic view of domestic and cross-border deals. The gravity model analyzes the deal flow as a vector with the direction of investment going from source to host. Finally, the investment rounds recognize prior participation of investor and target, and add the relevance of time to the understanding of PE activity.

To discover and measure the **determinants** that influence PE activity, a structured search of categories is developed from gravity model theories and private equity-related studies. The use of three schemes — PE-market environment, business process, and company stage — refines the relevant categories. The main categories for the gravity model are economic mass, economic distance, and country pair-specific indicators. For PE, the categories

are finance / banking sector, corporate country endowment, and political / legal country environment. For each category, relevant universal determinants are derived and refined by subcategories, supported by relevant academic literature.

The research design for empirical analysis has three steps: 1. pre-analysis, 2. descriptive analysis, and 3. explicative analysis. These are further divided into analysis of variance and analysis with explanatory variables. The design follows the pattern of the time series and cross-section analysis to the next level of panel data model and gravity model, and then to the final level of the gravity model over time.

The **pre-analysis** covers the development of investment over time from **1980** through **2005,** concluding with a boom and downturn of PE within a short time period — 1995 through 2005 — with its maximum in 2000 and highest growth rate in 1999. The cross-section delineates the ranking of **99** countries by PE activity, and breaks them down further into source and host countries. It further identifies activity by the different measurable variables and establishes the net importer and / or exporter role of a country. The cross-border analysis identifies **97** countries, **59** with source and **93** with host activity. The pre-analysis identifies the most relevant PE countries and the most relevant PE cross-border countries for the empirical analysis.

Significantly, the cross-section reveals a wide range of country activity, both for the dual role of source and host and for their domestic and cross-border investments. Particular focus is on the dominant investors, the US and the UK.

The **descriptive** analysis uses the three-dimensional gravity model with the added dimension of time to illustrate and analyze PE activity more completely.

The **panel-data** analysis compares the time series across countries to identify patterns in PE behavior over time. The curves show much volatility across countries; however, a cyclical pattern is shared between countries with similar growth rates of PE activity, especially in 1999, 2000, and 2001, indicating the intersection of a global trend and country-specific trends.

The **gravity model** with country pair deals exposes the affinity between countries for PE investment. It identifies three main streams of activity: the domestic deal concentration, the US and UK as dominant source countries, and the US as primary host country. Within these three main arrays, there is a diversified pattern of source and host activity. The gravity model also verifies the intensity of

country affinity toward particular trading partners and identifies the levels of diversification into host countries. The model tests the hypothesis of the influence of economic mass and geographic distance by sequencing the source and host pattern by country.

The **gravity model over time** investigates the evolution of cross-border activity and demonstrates shifts in cross-border investment. The different growth rates among country pairs reveals an overall trend of an increasing growth rate from 1998 through 2000 and a decreasing growth rate in 2001. These growth rates also expose a cyclical and anticyclical shift in source countries' selection of host countries. This occurs both within one country over time and also across countries. Changes in one country affect the whole system and thus rearrange the constellation of all countries.

The **dynamics of partnering and investment sequence** through partnering with other investors or by refinancing a company in several investment rounds capture shifts in investment behavior over time. The time series indicate that investors are looking primarily for single deals. Changes occur in the boom and downturn, beginning in 1997, with different behavior for domestic and cross-border deals. For cross-border deals, partnering as first investor is generally preferred. In domestic deals, however, investors participate increasingly as new co-investors in a deal arrangement with an established investor.

Investment activity scaled by GDP accounts for country size by economic mass and identifies high-density PE countries as financial centers. The top five cross-border countries with large global diversification are Singapore, Hong Kong, Luxembourg, the UK, and Israel.

Geographic analysis of countries as source and host verifies the global distribution and accumulation of continental cross-border activity. This arrangement presents the gravity model according to mass and distance, and shows countries in an interrelated global system of reactive relationships. The view by continent of source and host countries explains the competitive environment by density of cross-border activity. Three main regions are examined: North America, with two major countries, the US and Canada, accounts for 45% of global source activity and 36% of host activity. Europe, which is home to the large countries Germany, France, and the UK and which holds two large PE financial centers (the UK and Luxembourg), comprises 42%

of global source activity and 46% of global host activity. With Japan, China, India, and Taiwan, and with the financial centers of Singapore and Hong Kong, Asia accounts for 9% of source and 14% of host activity.

The analysis of country interaction shows a difference in global diversification of trade between and within the continents. The most intracontinental deal investment is in Europe with 21% of global source activity. North America accounts for 9% and Asia, 4%. The largest interaction between continents is between North America and Europe in both directions. Deal flow from North America to Europe is 23% and from Europe to North America, 19%. Europe's investment focus is on North America and on intracontinental deals; investments into Asia and the rest of the world account for only 1% each. North America and Asia are more connected, with relatively large trades from North America to Asia (9%) and from Asia to North America (5%). North America invests 4% into the rest of the world and Asia, 0%.

Explicative analysis verifies the main and interactional effects of source, host, and year, while the gravity model, with economic mass, economic distance, financial system, country endowment, and general environment, explores the influence and impact of each universal determinant on cross-border activity over time.

The **analysis of variance** (ANOVA) confirms the strong impact of country affinity on cross-border activity expressed through the significant interaction effect of the source / host pair. Further, ANOVA identifies the large impact of the source country effect for deal flow, deal participation, and activity.

The **gravity model analysis with explanatory variables** proves, with a variance between 0.50 and 0.60 for the full dataset, the impact of the explanatory categories and their determinants on cross-border activity. The analysis confirms the gravity model in general, explaining the affinity of countries with the impact of time-invariant (or less changeable) variables — such as economic mass, and geographic and economic distance — expressed in common characteristics such as language and legal system. Further, the gravity model verifies the impact of time variation determinants, namely the finance sector, country endowment, and institutional environment, especially on the PE environment,

Differentiation of **country activity** into the measurable variables of participation, deal participation, deal flow, and the summarizing variable, activity (expressed as

a percentage), verifies differing significance and elasticity for the determinants. While the basic indicators for participation, like geographic distance, are relevant, other crucial determinants such as host country development, corporate tax rates, and regulatory quality are important for deal flow.

The differentiation of overall investments into **company investment stages** shows differing effects for VC and PE. While determinants of language and economic mass are important for venture capital, size is not relevant for the PE source country. For PE cross-border investment, though, legal system and economic freedom in the host country and stock market capitalization in the source country are of great importance. Finally, it must be mentioned that cross-border PE and VC markets have been subject to strong cyclicality over the years with large growth rates. The experience has been similar for countries.

The research verifies that countries are defined by geographic distance and economic mass, which affect their intercountry behavior in the highly interrelated global system. The research also shows that country affinity is affected by cultural affinity, and the standards of the economic, political, and legal environment. Whereas time-fixed criteria (e.g., distance) define general affinity, time-varying, stand-alone determinants (e.g., interest rate changes) can trigger a shift in one country that then affects the relationships in the entire global system. This has potential consequences for each particular country as a source and / or host of investment.

2.   Implications for private equity investment

The following implications can now be derived from country-level determinants and applied on the firm level for successful cross-border deal investment. This analysis provides a framework for the investor and the target company to increase the likelihood of deal success by reducing information gaps and lowering transaction costs.

The gravity model utilizes both bilateral and stand-alone variables of countries. Country determinants are difficult to alter, although the following possibilities exist to optimize the affinity between investor and target. Due to the nature of their respective roles, investors can more easily adapt to such country determinants than target companies:

- Locate the investor firm in a globally optimal position for the targeted area

- Partner with investors experienced in similar deals

Along with gravity- and PE-related determinants, the model verifies the value of the following categories:

- **Economic mass:** Focus on economically large target countries to increase the likelihood of deal success. As a VC investor, relocation in a massive country increases the likelihood of success; investor country size is irrelevant for PE.

- **Economic distance:** Reduce the economic distance, especially by geographic location, and overcome cultural barriers, like language. For PE investment, a similar legal system enhances the likelihood of success.

- **Country pair:** Favor investment in trade-oriented countries with high standards of development. This lowers entrance barriers and increases the likelihood of deal success.

- **Banking system:** Aim for an established, well-funded financial system for the investor country and an efficient, competitive banking system in a target country. This enhances the probability of profitable PE investment.

- **Corporate endowment:** Find countries with a low corporate tax burden. This has a significant impact on cross-border deal activity. Also relevant are scientific competitiveness and a well-developed stock market in the investor country.

- **Institutional environment:** Rely on established high standards of the country system, which places confidence in the rules of society, particularly the quality of courts and contract enforcement. A high level of regulations that permit and promote private sector development also increases the chance of deal success.

The optimal location of an investor depends on the specific target country or countries included in the investment strategy, which means that an investor may relocate to a country that is strategic but not necessarily a target country.

Because everything in the global system is interconnected, exploiting an advantage in a target area will inherently affect the equilibrium of the whole system of supply and demand of PE investment.

The global expansion of established PE investors results in increased transaction costs due to differences in language, culture, and geography. Once committed to unfamiliar territory, investors may see some determinants, which were not considered earlier, may gain in relevance. For example, investors may be confronted with limiting factors, such as corruption, political instability, or reduced economic freedom.

The value of this research rests in its ability to provide a method and a comprehensive set of determinants to understand and optimize cross-border investments.

Because no single country is ideal for private equity activity, the relative advantage or disadvantage of entry in unfamiliar territory depends entirely on the particular constellation of attributes of investor and of the target company. Each combination is highly individual. The best chance for success depends on how well an investor adapts to a particular target area.

3.   Further research

Besides the important implications for cross-border investment, this study indicates points for further research. Further questions emerge from the theoretical concepts and the empirical results of the thesis.

- The core of the thesis is a quantitative empirical analysis of PE investment from 1980 through 2005. Because of the market dynamics that characterize the PE sector, it would be interesting to investigate if the determinants remain significant in the future or, as globalization continues, if new determinants emerge that have not yet been considered.

- The empirical analysis focuses on cross-border participation and investment between countries. The analysis does not consider the success of different funds within country pair constellations over time. The data availability of fund success is limited compared to the corpus of data that was considered in this dissertation. Future research could combine the approach of this paper's research with the success of deals between different sets of countries.

- The explicative analysis covering a 15-year time period is quite comprehensive. Based on the findings, further research could focus on

how past investment can inform new investment between countries. The investigation should focus on the impact of previous country environments on PE cross-border investment. How previous PE investments affect behavior could also be a fruitful area of investigation, because countries gain maturity in cross-border PE investment.

- To enhance understanding of the dynamics of the global PE system, with multiple interrelationships between countries, a rigorous inquiry could extend the bilateral gravity model to a multirelational system. In such an endeavor, it is conceivable to investigate the direct impact of certain characteristics of other countries, such as the constellation of neighboring countries or the distance to financial centers.

- This analysis differentiates the PE deal into specific measurable variables — participation, deal participation, and deal flow, further divided into VC and PE investment. Not yet differentiated are the various types of investors, their experiences in the market and in global diversification, and the deal sizes in which they operate.

Given the large impact of PE investment and the equally large expectations of PE investments, this dissertation clearly points to a need for further research, which would be necessary to enhance the knowledge and understanding of cross-border PE deals.

References

Acs, S. J. and Audretsch, D. B., New-Firm Startups, Technology, and Macroeconomic Fluctuations, *Small Business Economics*, 1994, *6.*

Aitken, N. D., The Effect of the EEC and EFTA on European Trade: A Temporal Cross-Section Analysis, *American Economic Review*, 1973, *63*(5), pp. 881-893.

Anderson, J. E., A Theoretical Foundation for the Gravity Equation, *American Economic Review*, 1979, *69*(1), pp. 106-116.

Apax Partners, Unlocking Global Value — Future Trends in Private Equity Investment Worldwide, 2006.

Atje, R. and Jovanovic, B., Stock Markets and Development, *European Economic Review*, 1993, *37*, pp. 632-640.

Baier, S. L. and Bergstrand, J. H., The Growth of World Trade: Tariffs, Transport Costs, and Income Similarity, *Journal of International Economics*, 2001, *53*(1), pp. 1-23.

Baker, M.; Stein, J. C. and Wurgler, J., When Does the Market Matter? Stock Prices and the Investment of Equity-Dependent Firms, *Quarterly Journal of Economics*, 2003, *118*(3), pp. 969-1005.

Baldwin, R., Towards an Integrated Europe *CEPR Discussion Paper*, 1994.

Baltagi, B. H., Econometric Analysis of Panel Data, Chichester; New York: Wiley, 1995.

Baltagi, B. H.; Bresson, G. and Pirotte, A., Fixed Effects, Random Effects or Hausman Taylor?: A Pretest Estimator, *Economics Letters*, 2003, *79*(3), pp. 361-369.

Baltagi, B. H.; Egger, P. and Pfaffermayr, M., A Generalized Design for Bilateral Trade Flow Models, *Elsevier*, 2003.

Baltagi, B. H.; Peter, E. and Michael, P., Estimating Models of Complex FDI: Are There Third-Country Effects?, *Journal of Econometrics*, 2007, *140*(1), pp. 260-265.

Barry, C., New Directions in Research on Venture Capital Finance, *Financial Management*, 1994, *23*(3), pp. 3-15.

Bascha, A. and Walz, U., Convertible Securities and Optimal Exit Decisions in Venture Capital Finance, *Journal of Corporate Finance*, 2001, *7*(3), pp. 285-306.

Baygan, G. and Freudenberg, M., The Internationalisation of Venture Capital Activity in OECD Countries: Implications for Measurement and Policy, *STI Working Paper 2000/7 OECD*, 2000.

Belke, A.; Fehn, R. and Foster, N., Venture Capital Investment and Labor Market Performance: A Panel Data Analysis, *CES ifo Working Paper*, 2002(652(4)).

Bengtsson, O., Relational Venture Capital Financing of Serial Founders, *Cornell University Working Paper Series*, 2008.

Berger, A. N., The Profit-Structure Relationship in Banking - Test of Market Power and Efficient Structure Hypothesis, *Journal of Money, Credit & Banking*, 1995, *27*, pp. 404-431.

Bergstrand, J., The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence, *The Review of Economics and Statistics*, 1985, *67(3)*, pp. 474-481.

Bergstrand, J. H., The Generalized Gravity Equation, Monopolistic Competition, and the Factor-Proportions Theory in International Trade, *The Review of Economics and Statistics*, 1989, *71*(1), pp. 143-149.

Bergstrand, J. H., The Heckscher-Ohlin-Samuelson Model, the Linder Hypothesis and the Determinants of Bilateral Intra-Industry Trade, *The Economic Journal*, 1990, *100*(403), pp. 1216-1234.

Bergstrand, J. H. and Egger, P., A Knowledge-And-Physical-Capital Model of International Trade Flows, Foreign Direct Investment, and Multinational Enterprises, *Journal of International Economics*, 2007, *73*(2), pp. 278-288.

Bikker, J. A., An International Trade Flow Model With Substitution: An Extension of the Gravity Model, *Kyklos*, 1987, *40*(3), pp. 315-338.

Bikker, J. A. and Haaf, K., Competition and Concentration and Their Relationship: An Empirical Analysis of the Banking Industry, *DNB Staff Report, De Nederlandsche Bank*, 2001, *68.*

Black, B. S. and Gilson, R. J., Does Venture Capital Require an Active Stock Market?, *Journal of Applied Corporate Finance*, 1999, pp. 36-48.

Black, B. S.; Gilson, R. J.; McCahery, J. and Renneboog, L., Venture Capital and the Structure of Capital Markets: Banks Versus Stock Markets, *Oxford and New York: Oxford University Press*, 2003, pp. 29-59.

Blonigen, B. A., A Review of the Empirical Literature on FDI Determinants, *Atlantic Economic Journal*, 2005, *33*(4), pp. 383-395.

Borrmann, C.; Jungnickel, R. and Keller, D., What Gravity Models Can Tell Us About the Position of German FDI in Central and Eastern Europe, *HWWA DISCUSSION PAPER*, 2005.

Bottazzi, L.; Da Rin, M. and Hellmann, T., The Changing Face of the European Venture Capital Industry: Facts and Analysis, *Journal of Private Equity*, 2004, *7*(2), pp. 26-53.

Brada, J. C.; Kutan, A. M. and Yigit, T. M., The Effects of Transition and Political Instability on Foreign Direct Investment Inflows, *Economics of Transition*, 2006, *14*(4), pp. 649-680.

Breusch, T. and Pagan, A., The LM Test and Its Applications to Model Specification in Econometrics, *Review of Economic Studies*, 1980, *47*, pp. 239-254.

Breusch, T. and Pagan, A., A Simple Test for Heteroscedasticity and Random Coefficient Variation, *Econometrica*, 1979, *47*, pp. 1287-1294.

Buch, C. and Piazolo, D., Capital Trade Flows in Europe and the Impact of Enlargement, *Kiel University Working Paper*, 2000, *1001.*

BVCA - The British Private Equity and Venture Capital Association, 2007, www.bvca.co.uk.

Bygrave, W. D. and Timmons, J. A., Venture Capital at the Crossroads, Boston, 1992.

Carlin, W. and Mayer, C., Finance, Investment and Growth, *CEPR, Discussion Paper*, 1999, *2223.*

Central Intelligence Agency, The World Factbook, Washington, DC: Central Intelligence Agency, 2007.

Cheng, I. H. and Wall, H. J., Controlling for Heterogeneity in Gravity Models of Trade and Integration, *Review (00149187)*, 2005, *87*(1), pp. 49-63.

Chintrakarn, P., The Determinants of Cross-Border Equity Flows: A Dynamic Panel Data Reassessment, *Applied Financial Economics Letters*, 2007, *3*(1-3), pp. 181-185.

Claessens, S. and Laeven, L., What Drives Bank Competition? Some International Evidence, *Journal of Money, Credit & Banking*, 2004, *36*(3), pp. 563-583.

Cochrane, J. H., The Risk and Return of Venture Capital, *Journal of Financial Economics*, 2005, *75*(3-52).

Cook, D. R. and Weisberg, S., Diagnostics for Heteroskedasticity in Regression, *Biometrika*, 1983, *70(1)*, pp. 1–10.

Cook, R. D. and Weisberg, S., Residuals and Influence in Regression, *Monographs on statistics and applied probability*, 1982, pp. 230-235.

Coval, J. and Thakor, A., Financial Intermediation as a Beliefs-Bridge Between Optimists and Pessimists, *Journal of Financial Economics*, 2004, *75*, pp. 535-570.

Cullen, J. B. and Gordon, R. H., Taxes and Entrepreneurial Activity: Theory and Evidence for the U.S., *NBER Working Paper W9015*, 2002.

Cumming, D. and Johan, S., Regulatory Harmonization and the Development of Private Equity Markets, *Journal of Banking & Finance*, 2007, *31*(10), pp. 3218-3221.

Cumming, D. and Walz, U., Private Equity Returns and Disclosure Around the World, *University of Alberta and University of Frankfurt*, 2004.

Cumming, D. J., Agency Costs, Institutions, Learning, and Taxation in Venture Capital Contracting, *Journal of Business Venturing*, 2005, *20*(5), pp. 573-578.

Cumming, D. J. and Macintosh, J. G., Boom, Bust and Litigation in Venture Capital Finance, *Willamette Law Review*, *49*(4), pp. 867-906.

Cumming, D. J. and MacIntosh, J. G., A Cross-Country Comparison of Full and Partial Venture Capital Exits, *Journal of Banking & Finance*, 2003, *27*(3), pp. 511-515.

D'Agostino, R. B.; Balanger, A. and R. B. D'Agostino, J., A Suggestion for Using Powerful and Informative Tests of Normality, *American Statistician*, 1990, *44*, pp. 316-321.

Da Rin, M.; Nicodano, G. and Sembenelli, A., Public Policy and the Creation of Active Venture Capital Markets, *University Torino*, 2004.

Davidson, R. and MacKinnon, J. G., Estimation and Inference in Econometrics, *Oxford University Press*, 1993, pp. 320-323.

Davies, R. B.; Ionascu, D. and Kristjansdottir, H., Estimating the Impact of Time-Invariant Variables on FDI with Fixed Effects2005, pp. 37-37.

De Mello Sampayo, F., The Location of the United States' FDI under the Share Gravity Model, *Discussion Paper University of Birmingham*, 2000, *00-04.*

Deardorff, A. V. and Frankel, J. A., Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?, *NBER Project Report series. Chicago and London: University of Chicago Press*, 1998, pp. 7-22.

Demirguc-Kunt, A. and Levine, R., Financial Structure and Economic Growth, *Cambridge MIT Press*, 2001.

Demirguc-Kunt, A. and Maksimovic, V., Law, Finance and Growth, *Journal of Finance*, 1998, *53*, pp. 2107-2137.

Di Mauro, F., The Impact of Economic Integration on FDI and Exports: A Gravity Approach, *CEPS Working Document*, 2000(156).

Djankov, S.; LaPorta, R.; Lopez-de-Silanes, F. and Shleifer, A., The Regulation of Entry, *Manuscript Harvard and the World Bank*, 2000.

Economic Intelligence Unit, Country Data, 2007.

Economic Intelligence Unit, Market indicators and forecast, 2007.

Economic Intelligence Unit, World Data, 2007.

Economic Intelligence Unit, World Investment Service, 2007.

Edwards, J. and Fischer, K., Banks, Finance and Investment in Germany, *Cambridge University Press*, 1994.

Egger, H. and Egger, P., International Outsourcing and the Productivity of Low-Skilled Labor in the EU, *Economic Inquiry*, 2006, *44*(1), pp. 98-105.

Egger, H. and Egger, P., Labor Market Effects of Outsourcing Under Industrial Interdependence, *International Review of Economics & Finance*, 2005, *14*(3), pp. 349-352.

Egger, P., An Econometric View on the Estimation of Gravity Models and the Calculation of Trade Potentials, *The World Economy*, 2002, *25*(2), pp. 297-299.

Egger, P., On the Role of Distance for Bilateral Trade, *The World Economy*, 2008, *31*(5), pp. 653-658.

Egger, P.; Huber, P. and Pfaffermayr, M., A Note on Export Openness and Regional Wage Disparity in Central and Eastern Europe, *The Annals of Regional Science*, 2005, *39*(1), pp. 63-64.

Egger, P. and Pfaffermayr, M., The Proper Panel Econometric Specification of the Gravity Equation: A Three-Way Model with Bilateral Interaction Effects, *Empirical Economics*, 2003, *28*(3), pp. 571-580.

Egger, P. and Winner, H., How Corruption Influences Foreign Direct Investment: A Panel Data Study, *Economic Development and Cultural Change*, 2006, *54*(2), pp. 459-468.

Evans, D. S. and Jovanovich, B., An Estimated Model of Entrepreneurial Choice Under Liquidity Constraints, *Journal of Political Economy*, 1998, *97*(4).

EVCA - European Venture Capital Association, EVCA - 2007 Yearbook, 2007.

EVCA - European Venture Capital Association, EVCA - Yearbook, 2005-2007.

Evenett, S. and Keller, W., On Theories Explaining the Success of the Gravity Equation, *Working Paper NBER*, 1998(6529).

Fama, E., What is Different about Banks?, *Journal of Monetary Economics*, 1985, *15.*

Fenn, G. W. and Liang, N., The Economic of the Private Equity Market, *Federal Reserve Bank of Dallas Economic Review*, 1995.

Frankel, J. A. and Rose, A. K., An Estimate of the Effect of Common Currencies on Trade and Income, *KSG Working Paper No. 01-013.*, 2001.

Freedom House (U.S.), Freedom in the World the Annual Survey of Political Rights and Civil Liberties, www.freedomhouse.org.

Fried, V. and Hisrich, R., Towards a Model of Venture Capital Investment Decision Making, *Financial Management*, 1994, *24*(3), pp. 28-37.

Gao, T., Foreign Direct Investment in China: How Big Are the Roles of Culture and Geography?, *Pacific Economic Review*, 2005, *10*(2), pp. 153-166.

Ghosh, S. and Yamarik, S., Are Regional Trading Arrangements Trade Creating? An Application of Extreme Bounds Analysis, *Journal of International Economics*, 2004, *63*(2), pp. 369-395.

Gilson, R. J. and Schizer, D., Venture Capital Structure: A Tax Explanation for Convertible Preferred Stock, *Harvard Law Review*, 2003, *116*, pp. 875-916.

Giot, P. and Schwienbacher, A., IPOs, Trade Sales and Liquidations: Modelling Venture Capital Exits Using Survival Analysis, *Journal of Banking & Finance*, 2007, *31*(3), pp. 679-702.

Glick, R. and Rose, A. K., Does a Currency Union Affect trade? The Time-Series Evidence, *European Economic Review*, 2002, *46*(6), pp. 1125-1130.

Gompers, P. and Lerner, J., An Analysis of Compensation in the US Venture Capital Partnership, *Journal of Financial Economics*, 1999, *51*, pp. 3-44.

Gompers, P. A., Optimal Investment, Monitoring, and the Staging of Venture Capital, *Journal of Finance*, 1995, *50*(5), pp. 1461-1489.

Gompers, P. A.; Kovner, A.; Lerner, J. and Scharfstein, D. S., Venture Capital Investment Cycles: The Impact of Public Markets, *NBER Working Paper*, 2005(W11385).

Gompers, P. A. and Lerner, J., Venture Capital and the Creation of Public Companies: Do Venture Capitalists Really Bring More than Money?, *Journal of Private Equity*, 1997, *1*(1), pp. 15-32.

Gompers, P. A. and Lerner, J., The Venture Capital Cycle, Cambridge, Mass.: MIT Press, 2004.

Gompers, P. A. and Lerner, J., What Drives Venture Capital Fundraising?, *National Bureau of Economic Research (NBER) Working paper series*, 1999.

Gorman, M. and Sahlman, W., What Do Venture Capitalists Do?, *Journal of Business Venturing*, 1989, *4*, pp. 231-248..

Greene, W.; Harris, M. N. and Matyas, L., Gravity Models, Zero Trade Flows and Fixed Effects, 2006.

Greene, W. H., Econometric Analysis, Upper Saddle River, N.J.: Prentice Hall, 2003.

Greenwood, J. and Smith, B. D., Financial Markets in Development, and the Development of Financial Markets., *Journal of Economic Dynamics and Control*, 1997, *21*(1), pp. 145-181.

Grubert, H. and Mutti, J., Empirical Asymmetries in Foreign Direct Investment and Taxation, *Journal of International Economics*, 2004, *62*(2), pp. 337-358.

Gujarat, D., Basic Econometrics, New York, 2003.

Gupta, A. K. and Sapienza, H., Determinants of Venture Capital Firms' Preferences Regarding the Industry Diversity and Geographic Scope of Their Investments., *Journal of Business Venturing*, 1992, *7*(5), pp. 347-362.

Hall, R. E. and Jones, C. I., Why Do Some Countries Produce So Much More Output per Worker than Others?, *Quarterly Journal of Economics*, 1999, *114*(1), pp. 83-116.

Hardymon, G. F.; De Nino, M. J. and Salter, M. S., When Corporate Venture Capital Doesn't Work., *Harvard Business Review*, 1983, *114.*

Harris, M. N. and Matyas, L., Modelling Export Flows in the APEC Region: Static and Dynamic Gravity Model Approaches, *Asia Pacific Journal of Economics and Business*, 2001, *5*(1), pp. 97-118.

Hart, O., Financial Contracting, *Working Paper, Harvard University*, 2000.

Hausman, J. A., Specification Tests in Econometrics, *Econometrica*, 1978, *46*, pp. 1251-1271.

Hausman, J. A. and Taylor, W. E., Panel Data and Unobservable Individual Effects, *Journal of Econometrics*, 1981, *16*(1), pp. 155-156.

Hellmann, F. T. and Puri, M., The Determinants of Venture Capital Funding: Evidence Across Countries, *Journal of Corporate Finance*, 2001, *6*, pp. 241-289.

Hellmann, T. and Puri, M., The Interaction Between Product Market and Financial Strategy: The Role of Venture Capital, *Review of Financial Studies*, 2000, *13*, pp. 959-984.

Helpmann, E., The Structure of Foreign Trade, *Journal of Economic Perspectives*, 1999, *13*(2), pp. 121-144.

Helpmann, E. and Krugmann, P. R., Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition and the International Economy, *MIT Press, Cambridge, MA*, 1985.

Heritage Foundation (Washington D.C.) and Wall Street Journal (Firm), Index of Economic Freedom.

Hitt, M. A.; Tihanyi, L.; Miller, T. and Connelly, B., International Diversification: Antecedents, Outcomes, and Moderators, *Journal of Management*, 2006, *32*(6), pp. 831-841.

Hofstede, G., Cultural Constraints in Management Theories, *International Review of Strategic Management*, 1994, *5*, pp. 27-37.

Hofstede, G., Organizing for Cultural Diversity, *European Management Review*, 2001, *7*(4), pp. 390-397.

Hofstede, G. and Bond, M. H., The Confucius Connection: From Cultural Roots to Economic Growth, *Organizational Dynamics*, 1988, *16*(4), pp. 4-7.

Hofstede, G. H., Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations, Thousand Oaks, Calif.: Sage Publications, 2001.

Holmes, T. J. and Schmitz, J. A., On the Turnover of Business Firms and business Managers, *Journal of Political Economy*, 1995, *103*(5).

Hong, H. and Stein, J. C., A Unified Theory of Underreaction Momentum Trading, and Overreaction in Asset Markets, *Journal of Finance*, 1999, *54*, pp. 2143-2184.

Hsiao, C., Analysis of Panel Data, *Cambridge University Press*, 1986.

Hummels, D. and Levinsohn, J., Monopolistic Competition and International Trade: Reconsidering the Evidence, *Quarterly Journal of Economics*, 1995, *110*(3), pp. 799-837.

International Labour Organization, LABORSTAT, 2007.

International Monetary Fund, International Financial Statistics, 2008, www.imfstatistics.org/imf.

Ionascu, D.; Meyer, K. E. and Estrin, S., Institutional Distance and International Business Strategies in Emerging Economies, *Working Papers (William Davidson Institute) - University of Michigan Business School*, 2004, pp. 1-44.

Isard, W., Location Theory and Trade Theory: Short-Run Analysis, *Quarterly Journal of Economics*, 1954, *68*, pp. 305- 322.

Janeba, E., International Trade and Consumption Network Externalities, *European Economic Review*, 2007, *51*(4), pp. 781-803.

Jelic, R.; Saadouni, B. and Wright, M., Performance of Private to Public MBOs: The Role of Venture Capital, *Journal of Business Finance & Accounting*, 2005, *32*, pp. 643-682.

Jeng, L. A. and Wells, P. C., The Determinants of Venture Capital Funding: Evidence Across Countries, *Journal of Corporate Finance*, 2000, *6*(3), pp. 241-289.

Jensen, M. C., Presidential Address: The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems, *Journal of Finance*, 1993, *48.*

Johnson, S.; McMillan, J. and Woodruff, C., Property Rights and Finance, *NBER Working Paper*, 2002(8852).

Josselin, D. and Nicot, B., A Geo-Economic Gravity of Trade for European Union, *Gybergeo: Revue Europeenne de Geographie*, 2003(237).

Kaplan, S.; Sensoy, B. and Strömberg, P., How Well do Venture Capital Databases Reflect Actual Investments?, 2002.

Kaplan, S.; Sensoy, B. A. and Stromberg, P. J., What Are Firms? Evolution from Birth to Public Companies, *CEPR Discussion Papers*, 2005, *5224.*

Kaplan, S. N.; Martel, F. and Strömberg, P., How Do Legal Differences and Experience Affect Financial Contracts?, *Journal of Financial Intermediation*, 2007, *16*(3), pp. 273-279.

Kaplan, S. N. and Schoar, A., Private Equity Performance: Returns, Persistence, and Capital Flows, *The Journal of Finance*, 2005, *60*(4), pp. 1791-1793.

Kaplan, S. N. and Strömberg, P., Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts, *Working Paper, University of Chicago*, 2001.

Kaplan, S. N. and Strömberg, P., How Do Venture Capitalists Choose and Manage Their Investments?, *Working Paper, University of Chicago*, 2000.

Kaplan, S. N. and Strömberg, P., Venture Capitalists as Principals: Contracting, Screening, and Monitoring, *NBER Working Paper Cambridge, Mass.*, 2001, *8202.*

Kaufmann, D.; Kraay, A. and Mastruzzi, M., Governance Matters 2007 Worldwide Governance Indicators, 1996-2006.

Keuschnigg, C. and Nielsen, S. B., Tax Policy, Venture Capital and Entrepreneuership, *Journal of Public Economics*, 2003, *87*, pp. 175-203.

Kim, S.-J. and Hooper, V. J., The Determinants of Capital Inflows: Does Opacity of Recipient Country Explain the Flows?, *Economic Systems*, 2007, *Vol. 31*(1).

Kortum, S. and Lerner, J., Assessing the Contribution of Venture Capital to Innovation, 2000.

Kortum, S. S. and Lerner, J., Does Venture Capital Spur Innovation?, *National Bureau of Economic Research (NBER) Working paper series*, 1998.

Kraft, V., Private Equity in Turnaround Investments, 2001.

Krugmann, P. R., Scale Economies, Product Differentiation, and the Pattern of Trade., *American Economic Review*, 1980, *70*, pp. 950-959.

Kumar, V. and Orleck, S., Why Does Private Equity Vary Across Countries and Time?, 2002.

La Porta, R.; Lopez-de-Silanes, F.; Shleifer, A. and Vishny, R., Investor Protection and Corporate Governance, *Journal of Financial Economics*, 2000, *58*, pp. 3-28.

La Porta, R.; Lopez-de-Silanes, F.; Shleifer, A. and Vishny, R., Legal Determinants of External Finance, *Journal of Finance*, 1997, *52*, pp. 1131-1150.

La Porta, R.; Lopez-de-Silanes, F.; Shleifer, A. and Vishny, R. W., Law and Finance, *Journal of Finance*, 1996.

Lane, P. R. and Milesi-Ferretti, G. M., Examining Global Imbalances, *Finance & Development*, 2006, *43*(1), pp. 38-45.

Leachman, L.; Kumar, V. and Orleck, S., Explaining Variations in Private Equity: A Panel Approach, *Duke University, Department of Economics, Working Papers*, 2002, *02-14.*

Lerner, J., Boom and Bust in the Venture Capital Industry and the Impact on Innovation, *Harvard NOM Working Paper*, 2001(03-13).

Lerner, J., Venture Capitalists and the Decision to Go Public, *Journal of Financial Economics*, 1994, *35*(3), pp. 293-316.

Lerner, J., Venture Capitalists and the Oversight of Private Firms, *The Journal of Finance*, 1995, *50*(1), pp. 301-307.

Lerner, J. and Schoar, A., Does Legal Enforcement Affect Financial Transactions? The Contractual Channel in Private Equity, *Quarterly Journal of Economics*, 2005, *120*(1), pp. 223-246.

Lerner, J. and Schoar, A., Transaction Structures in the Developing World, *NBER Working Papers*, 2004, *10348.*

Levin, J., Structuring Venture Capital, Private Equity and Entrepreneurial Transactions, New York, 1998.

Levine, R. and Zervos, S., Stock Markets, Banks, and Economic Growth, *American Economic Review 88*, 1998, pp. 537-558.

Linder, S. B., An Essay OnTrade and Transformation, New York: John Wiley, 1961.

Linders, G. T. and De Groot, H., Estimation of the Gravity Equation in the Presence of Zero Flow, *Tinbergen Institute Discussion Paper, Tinbergen Institute, Free University Amsterdam*, 2006, *Ti 2006-073*(3).

Linnemann, H., An Econometric Study of International Trade Flows, *Thesis*, 1966, pp. 1-234.

Ljungqvist, A. and Richardson, M. P., The Cash Flow, Return and Risk Characteristics of Private Equity, *New York University Working Paper*, 2003.

Ljungqvist, A. and Richardson, M. P., The Investment Behavior of Private Equity Fund Managers, *New York University Working Paper*, 2003.

MacMillan, I. C.; Zemann, L. and Subba Narasimha, P. N., Criteria Distinguishing Successful from Unsuccessful Ventures in the Venture Screening Process., *Journal of Business Venturing*, 1987, *2*, pp. 123-137.

Maksimovic, V.; Beck, T.; Demirguc-Kunt, A. and Levine, R., Financial Structure and Economic Development: Firm, Industry, and Country Evidence, *World Bank Policy Research Working Paper*, 2000(2423).

Matyas, L., The Gravity Model: Some Econometric Considerations, *World Economy*, 1998, *21*(3), pp. 397-402.

Matyas, L., Proper Econometric Specification of the Gravity Model, *World Economy*, 1997, *20*(3), pp. 363-369.

Matyas, L.; Konya, L. and Harris, M. N., Modeling Export Activity in a Multicountry Economic Area: The APEC Case, *Monash Econometrics and Business Statistics Working Papers*, 1997, *1/97.*

Mayer, C., Financing the New Economy: Financial Institutions and Corporate Governance, *Information Economics and Policy*, 2001, *1.*

Mayer, C., New Issues in Corporate Finance, *European Economic Review*, 1988, *32.*

Messica, A. and Agmon, T., Temporal Comparative Analysis of the US Venture Capital Industry Over 1980 to 2002, *Holon Institute of Technology Working Paper Series*, 2006.

Mundlak, Y., On the Pooling of Time Series and Cross Section Data, *Econometrica*, 1978, *46*(1), pp. 69-85.

Myers, S. and Majluf, N., Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have, *Journal of Financial Economics*, 1984, *13.*

Noguer, M. and Canals, C., The Determinants of Cross-Border Investment: A Value-Chain Analysis, *La Caixa' Working Paper*, 2007, *No. 05/2006.*

NVCA - National Venture Capital Association (USA), National Venture Capital Association Yearbook, Arlington, VA, 1990-2005.

OECD, OECD Factbook 2007, 2007.

OECD, OECD Statistics of Foreign Trade, 2007.

Oguledo, V. I. and MacPhee, C. R., Gravity Models: A Reformulation and an Application to Discriminatory Trade Arrangements, *Applied Economics*, 1994, *26*(2), pp. 1007-1021.

Park, W. and Ginarte, C., Intellectual Property Rights and Economic Growth, *Contemporary Economic Policy*, 1997, *July 15*(3), pp. 5-12.

Phalippou, L. and Zollo, M., What Drives Private Equity Fund Performance?, *University of Amsterdam, Faculty of Economics and Econometrics*, 2005.

Pirotte, A., Convergence of the Static Estimation Toward the Long-Run Effects of Dynamic Panel Data Models: A Labour Demand Illustration, *Applied Economics Letters*, 2003, *10*(13), pp. 843-847.

Plummer, J. L., QED Report on Venture Capital Financial Analysis, Palo Alto: QED Research, 1987.

Portes, R. and Rey, H., The Determinants of Cross-Border Equity Flows, *Journal of International Economics*, 2005, *65*(2), pp. 269-311.

Poterba, J. M., Venture Capital and Capital Gain Taxation, *Tax Policy and the Economy*, 1989, *3*, pp. 47-67.

Pratt, S. P., Guide to Venture Capital Sources, Wellesley, Mass.: Captial Publishing, 1981.

Prowse, S. D., The Economics of the Private Equity Market, *Federal Reserve Bank of Dallas Economic Review*, 1998, pp. 21-34.

Raballand, G., Determinants of the Negative Impact of Being Landlocked on Trade: An Empirical Investigation Through the Central Asian Case, *Comparative Economic Studies*, 2003, *45*(4), pp. 520-536.

Ranjan, D.; M., J. and A., S., Private Equity Returns: An Empirical Examination of the Exit of Venture Backed Companies, *Journal of Investment Management*, 2003, *11*, pp. 152-177.

Ritter, J., Initial Public Offerings, *Contemporary Finance Digest*, 1998, *2*(1).

Roe, M. J., Political and Legal Restraints on Ownership and Control of Public Companies, *Journal of Financial Economics*, 1990, *27.*

Rose, A., Which International Institutions Promote International Trade?, *Review of International Economics*, 2005, *13*(4), pp. 682-685.

Rose, A. K. and Spiegel, M. M., Offshore Financial Centers: Parasites or Symbionts?, *The Economic Journal*, 2007, *117*(523), pp. 1310-1314.

Ruhnka, J. C. and Young, J. E., A Venture Capital Model of the Development Process for New Ventures, *Journal of Business Venturing*, 1987, *2*, pp. 167-184.

Ruiz, J. M. and Vilarrubia, J. M., The Wise Use of Dummies in Gravity Models: Export Potentials in the Euromed Region, *Banco de Espana, Eurosistema*, 2007.

Sahlman, W. A., Insights from the American Venture Capital Organizations, *Working Paper*, 1991.

Sahlman, W. A., The Structure and Governance of Venture Capital Organizations, *Journal of Financial Economics*, 1990, *27*, pp. 473-524.

Sapir, A., Trade Benefits under EEC Generalized System of Preferences, *European Economic Review*, 1981, *15*(3), pp. 339-335.

Sarisoy Guerin, S., The Role of Geography in Financial and Economic Integration: A Comparative Analysis of Foreign Direct Investment, Trade and Portfolio Investment Flows, *World Economy*, 2006, *29*(2), pp. 189-209.

Saxenian, A. L., Regional Advantage: Culture and Competition in Silicon Valley and Route 128, Cambridge, Mass.: Harvard University Press, 1996.

Sayrs, L., Pooled Time Series Analysis, Newbury Park, CA, 1989.

Schertler, A., Driving Forces of Venture Capital Investments in Europe - A Dynamic Panel Analysis, *United Nations University, Institute for New Technologies*, 2003, *Technology and Finance Working Papers*(23).

Schwienbacher, A., Innovation and Venture Capital Exits, *Working Paper University of Amsterdam*, 2003.

Serlenga, L. and Shin, Y., Gravity Models of the Intra-EU Trade: Application of the Hausman-Taylor Estimation in Heterogeneous Panels with Common Time-Specific Factors, *ESE Discussion Paper University of Edinburgh, School of Economics*, 2004, *105.*

Shleifer, A., Government in Transition, *European Economic Review*, 1997, *41*, pp. 385-410.

Shleifer, A.; Hay, J. and Vishny, R., Towards a Theory of Legal Reform, *European Economic Review*, 1996.

Siegel, R.; Siegel, E. and Mac Millan, I. C., Corporate Venture Capitalists: Autonomy, Obstacles, and Performance, *Journal of Business Venturing*, 1988, *3.*

SimTrade, A Gravity Model for the Calculation of Trade Potentials for Developing Countries and Countries in Transition, *Discussion paper, UNCTAD/WTO, International Trade Center*, 2003.

Standard & Poor's, Capital IQ, 2007, www.capitaliq.com/main.asp.

Stata Corporation., Longitudinal/Panel data, College Station, Tex.: Stata Press, 2005.

The Merger Market Group, Merger Market, 2007, www.mergermarket.com.

Thomson Financial, Venture Xpert, 2006, www.thomson.com/content/financial/brand_overviews/VentureXpert.

Tinbergen, J., Shaping the World Economy, *International Executive*, 1963, *5*(1), pp. 27-30.

Toll, D. M., Private Equity Partnership Terms and Conditions, Wellesley, Mass., 1999.

Tyebjee, T. and Bruno, A., A Model of Venture Capitalist Investment Activity, *Management Science*, 1984, *30*(9), pp. 1051-1066.

Tykvova, T.; Westerheide, P. and Zinser, B., Private Equity im internationalen Vergleich — Analyse der Rahmenbedingungen und Schlussfolgerungen für Deutschland, *ZEW - Center for European Economic Research*, 2005.

U.S. Department of Labor- Bureau of Labor Statistics National Longitudinal Survey of Income Dynamics.

UCLA, Regression Diagnostics, 2008, www.ats.ucla.edu/stat/stata/webbooks/reg/chapter2/statareg2.htm.

UCLA, Simple and Multiple Regression, 2008, www.ats.ucla.edu/stat/Stata/webbooks/reg/chapter1/statareg1.htm.

University of Michigan, Michigan Panel Study of Income Dynamics.

Vives, X., Competition in the Changing World of Banking, *Oxford Review of Economic Policy*, 2001, *17*, pp. 535-545.

Wang, Z. and Winters, L., The Trading Potential of Eastern Europe, *CEPR Discussion Paper 610 London*, 1991.

Wansbeek, T. and Kapteyn, A., Estimation of the Error-Components Model with Incomplete Panels, *Journal of Econometrics*, 1989, *41*(3), pp. 341-361.

White, H., A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity, *Econometrica*, 1980, *48*(4), pp. 817-838.

Wooldridge, J. M., Econometric Analysis of Cross Section and Panel Data, Cambridge, Mass.: MIT Press, 2002.

World Bank, Financing Growth — Financial & Private Sector Development, 2007.

World Bank Group, WDI online, Washington, DC: World Bank Group.

World Intellectual Property Organization, WIPO Industrial Property Statistics, 2007.

Worldbank, Financing Growth - Financial & Private Sector Development, 2007.

Wright, M. and Robbie, K., Venture Capital and Private Equity: A Review and Synthesis, *Journal of Business Finance & Accounting*, 1998, *25*(5/6), pp. 521-570.

Wright, M.; Thompson, S. and Robbie, K., Venture Capital and Management Led Leveraged Buyouts: A European Perspective, *Journal of Business Venturing*, 1992, *7*, pp. 47-71.

Yeaple, S. R., The Role of Skill Endowments in the Structure of U.S. Outward Foreign Direct Investment, *Review of Economics and Statistics*, 2003, *85*(3), pp. 726-734.

Appendix

Appendix 1: Overview private equity data derivation

Appendix 2: Venture capital investments (cross-section analysis)

		Rank				Absolute volume of deals ($US mln)									Difference source-host			Percentage of total deals									Activity %		
						Overall (Source+Host)			Source			Host						Overall			Source			Host					
Nr.	Country	O	S	H	Dif	Part.	Dealp.	Dflow	Part.	Dealp.	Dflow	Part.	Dealp.	Dflow	Part.	Dealp.	Dflow	Part.	Dealp.	Dflow	Part.	Dealp.	Dflow	Part.	Dealp.	Dflow	Source	Host	Overall
1	United States of A.	1	1	1	0	229,028	101,338	732,822	113,213	50,766	375,987	115,815	50,572	356,834	-2,602	194	19,153	79.9%	73.0%	74.5%	79.0%	73.1%	76.5%	80.8%	72.9%	72.6%	76.20%	75.41%	75.80%
2	United Kingdom	2	2	2	0	13,897	9,270	89,885	8,223	5,299	52,998	5,674	3,972	36,887	2,549	1,327	16,110	4.8%	6.7%	9.1%	5.7%	7.6%	10.8%	4.0%	5.7%	7.5%	8.05%	5.73%	6.89%
3	France	3	3	3	0	7,254	4,213	24,011	3,533	1,987	8,365	3,721	2,227	15,645	-188	-240	-7,280	2.5%	3.0%	2.4%	2.5%	2.9%	1.7%	2.6%	3.2%	3.2%	2.34%	3.00%	2.67%
4	Germany	4	4	4	0	4,767	2,834	13,652	2,369	1,281	4,736	2,398	1,553	8,916	-29	-272	-4,180	1.7%	2.0%	1.4%	1.7%	1.8%	1.0%	1.7%	2.2%	1.8%	1.49%	1.91%	1.70%
5	Canada	5	5	5	0	4,381	2,021	12,894	2,303	974	6,473	2,078	1,048	6,420	225	-74	53	1.5%	1.5%	1.3%	1.6%	1.4%	1.3%	1.4%	1.5%	1.3%	1.44%	1.42%	1.43%
6	Australia	6	6	7	1	2,865	2,330	7,465	1,488	1,184	3,868	1,377	1,145	3,597	111	39	271	1.0%	1.7%	0.8%	1.0%	1.7%	0.8%	1.0%	1.7%	0.7%	1.18%	1.11%	1.15%
7	South Korea	7	7	6	-1	2,562	2,024	6,476	1,230	968	1,793	1,332	1,056	4,682	-102	-88	-2,889	0.9%	1.5%	0.7%	0.9%	1.4%	0.4%	0.9%	1.5%	1.0%	0.87%	1.13%	1.00%
8	Sweden	8	8	9	1	2,143	1,424	8,083	987	638	4,282	1,156	786	3,801	-169	-147	481	0.7%	1.0%	0.8%	0.7%	0.9%	0.9%	0.8%	1.1%	0.8%	0.83%	0.90%	0.87%
9	India	9	11	8	-3	1,829	1,656	5,707	822	748	1,498	1,007	908	4,209	-185	-160	-2,711	0.6%	1.2%	0.6%	0.6%	1.1%	0.3%	0.7%	1.3%	0.9%	0.65%	0.96%	0.80%
10	Netherlands	10	9	10	1	1,781	1,166	8,766	985	626	4,097	796	539	4,668	188	87	-571	0.6%	0.8%	0.9%	0.7%	0.9%	0.8%	0.6%	0.8%	0.9%	0.81%	0.76%	0.78%
11	Israel	11	10	12	2	2,067	972	4,851	1,098	484	2,634	969	488	2,218	129	-5	416	0.7%	0.7%	0.5%	0.8%	0.7%	0.5%	0.7%	0.7%	0.5%	0.67%	0.61%	0.64%
12	Japan	12	13	11	-2	1,056	592	10,326	654	272	4,123	402	320	6,203	252	-48	-2,080	0.4%	0.4%	1.1%	0.5%	0.4%	0.9%	0.3%	0.5%	1.3%	0.56%	0.67%	0.61%
13	Finland	13	15	14	-1	1,432	1,139	2,614	705	547	1,050	727	591	1,564	-22	-44	-514	0.5%	0.8%	0.3%	0.5%	0.8%	0.2%	0.5%	0.9%	0.3%	0.50%	0.56%	0.53%
14	Denmark	14	17	13	-4	1,291	835	3,806	601	386	856	690	449	2,951	-90	-62	-2,095	0.5%	0.6%	0.4%	0.4%	0.6%	0.2%	0.5%	0.6%	0.6%	0.38%	0.58%	0.48%
15	Switzerland	15	16	16	0	1,319	719	4,301	744	386	1,837	576	333	2,464	168	53	-627	0.5%	0.5%	0.4%	0.5%	0.6%	0.4%	0.4%	0.5%	0.5%	0.48%	0.46%	0.47%
16	Hong Kong	16	12	21	9	769	526	7,476	479	317	5,513	290	210	1,963	189	107	3,549	0.3%	0.4%	0.8%	0.3%	0.5%	1.1%	0.2%	0.3%	0.4%	0.64%	0.30%	0.47%
17	Singapore	17	14	22	8	1,029	564	5,005	697	312	3,571	332	252	1,434	365	60	2,137	0.4%	0.4%	0.5%	0.5%	0.5%	0.7%	0.2%	0.4%	0.3%	0.55%	0.30%	0.42%
18	Ireland-Rep	18	22	17	-5	732	475	3,264	275	183	353	458	292	2,912	-183	-109	-2,559	0.3%	0.3%	0.3%	0.2%	0.3%	0.1%	0.3%	0.4%	0.6%	0.18%	0.44%	0.31%
19	Italy	19	19	18	-1	602	428	3,797	307	198	1,336	296	230	2,461	11	-31	-1,125	0.2%	0.3%	0.4%	0.2%	0.3%	0.3%	0.2%	0.3%	0.5%	0.26%	0.35%	0.30%
20	China	20	25	15	-10	643	377	3,745	167	103	360	476	274	3,385	-309	-172	-3,025	0.2%	0.3%	0.4%	0.1%	0.1%	0.1%	0.3%	0.4%	0.7%	0.11%	0.47%	0.29%
21	Belgium	21	20	20	0	720	452	2,424	342	206	550	378	245	1,874	-36	-39	-1,325	0.3%	0.3%	0.2%	0.2%	0.3%	0.1%	0.3%	0.4%	0.4%	0.22%	0.33%	0.27%
22	Spain	22	23	19	-4	529	396	2,873	184	142	889	345	254	1,984	-161	-111	-1,095	0.2%	0.3%	0.3%	0.1%	0.2%	0.2%	0.2%	0.4%	0.4%	0.17%	0.34%	0.25%
23	Taiwan	23	18	26	8	656	389	1,841	449	219	1,223	207	169	618	243	50	606	0.2%	0.3%	0.2%	0.3%	0.3%	0.2%	0.1%	0.2%	0.1%	0.29%	0.17%	0.23%
24	Norway	24	21	25	4	514	376	1,338	292	206	574	222	170	763	71	35	-189	0.2%	0.3%	0.1%	0.2%	0.3%	0.1%	0.2%	0.2%	0.2%	0.21%	0.19%	0.20%
25	Brazil	25	24	24	0	388	315	1,445	163	135	382	225	180	1,063	-63	-46	-681	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%	0.2%	0.3%	0.2%	0.13%	0.21%	0.17%
26	Bermuda	26	42	23	-19	94	45	3,765	12	10	42	82	36	3,722	-70	-26	-3,680	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.1%	0.1%	0.8%	0.01%	0.29%	0.15%
27	Austria	27	26	28	2	380	275	490	167	126	170	214	148	320	-47	-22	-151	0.1%	0.2%	0.0%	0.1%	0.2%	0.0%	0.1%	0.2%	0.1%	0.11%	0.14%	0.13%
28	Luxembourg	28	29	27	-2	88	70	2,643	58	48	481	30	21	2,162	28	27	-1,681	0.0%	0.1%	0.3%	0.0%	0.1%	0.1%	0.0%	0.0%	0.4%	0.07%	0.16%	0.12%
29	New Zealand	29	28	29	1	223	195	688	110	94	135	113	101	553	-3	-6	-419	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%	0.1%	0.1%	0.08%	0.11%	0.10%
30	Malaysia	30	27	32	5	217	161	459	130	87	170	87	75	289	43	12	-119	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	0.1%	0.08%	0.08%	0.08%
31	Poland	31	30	35	5	153	135	470	81	71	199	72	64	270	10	7	-71	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	0.1%	0.07%	0.07%	0.07%
32	Indonesia	32	36	31	-5	91	65	855	28	17	241	63	48	613	-35	-31	-372	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.03%	0.08%	0.06%
33	Argentina	33	49	30	-19	71	40	1,020	6	5	3	65	35	1,017	-59	-30	-1,015	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.00%	0.10%	0.05%
34	Czech Republic	34	35	36	1	120	96	370	48	38	103	73	58	268	-25	-21	-165	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.1%	0.1%	0.1%	0.04%	0.06%	0.05%
35	Hungary	35	37	34	-3	121	102	239	41	34	23	80	68	216	-39	-34	-193	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.03%	0.07%	0.05%
36	Thailand	36	38	33	-5	102	99	319	26	26	16	76	74	303	-50	-48	-287	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.02%	0.07%	0.05%
37	Portugal	37	33	38	5	115	95	256	51	43	88	64	52	169	-13	-9	-81	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.04%	0.05%	0.04%
38	Russian Federation	38	31	41	10	102	83	234	60	43	128	42	40	106	18	3	22	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.04%	0.04%	0.04%
39	South Africa	39	34	40	6	99	79	233	49	40	114	50	38	119	-1	2	-5	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.04%	0.04%	0.04%
40	Philippines	40	39	37	-2	78	57	334	29	15	49	49	43	286	-20	-28	-237	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.02%	0.05%	0.03%
41	Mexico	41	66	39	-27	37	32	271	1	0	0	36	31	271	-35	-31	-271	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.00%	0.04%	0.02%
42	Romania	42	44	42	-2	43	37	197	10	10	30	33	27	166	-23	-17	-136	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.03%	0.02%
43	Mauritius	43	32	88	56	52	36	162	51	35	162	1	1	0	50	34	162	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.04%	0.00%	0.02%
44	Zambia	44	0	43	0	2	2	325	0	0	0	2	2	325	-2	-2	-325	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.00%	0.02%	0.01%
45	Ukraine	45	40	49	9	29	29	20	16	16	6	13	13	14	3	3	-8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.01%	0.01%
46	Iceland	46	43	48	5	30	23	42	13	12	19	17	11	24	-4	2	-5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.01%	0.01%
47	Bulgaria	47	54	44	-10	15	10	167	3	3	0	12	7	167	-9	-4	-167	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
48	Nigeria	48	46	46	0	18	16	101	8	7	9	10	9	92	-2	-2	-83	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.01%	0.01%
49	Greece	49	41	59	18	23	20	19	15	13	14	8	7	4	7	7	10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.01%	0.01%
50	Chile	50	57	45	-12	15	11	84	3	1	0	12	10	84	-9	-8	-84	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
51	Slovak Republic	51	0	47	0	14	12	24	0	0	0	14	12	24	-14	-12	-24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
52	Vietnam	52	47	56	9	14	14	7	6	6	2	8	8	6	-2	-2	-4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.01%
53	Pakistan	53	52	52	0	10	10	51	4	4	0	6	6	51	-2	-2	-51	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
54	Cayman Islands	54	45	75	30	17	8	28	15	6	26	2	2	1	13	4	25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.00%	0.01%
55	Croatia	55	0	50	0	11	11	15	0	0	0	11	11	15	-11	-11	-15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
56	Tanzania	56	0	51	0	2	2	94	0	0	0	2	2	94	-2	-2	-94	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
57	Estonia	57	56	55	-1	7	5	53	3	1	3	4	4	51	-1	-3	-48	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
58	Turkey	58	50	62	12	11	10	8	5	5	0	6	5	8	-1	-1	-8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
59	Ghana	59	60	54	-6	10	10	5	1	1	0	9	9	4	-8	-8	-4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
60	United Arab Emirates	60	48	64	16	7	7	33	4	4	23	3	3	10	1	1	13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
61	Kenya	61	0	53	0	9	5	31	0	0	0	9	5	31	-9	-5	-31	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
62	Cyprus	62	61	57	-4	5	5	46	1	1	0	4	4	45	-3	-3	-45	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
63	Lithuania	63	54	60	6	8	8	18	3	3	0	5	5	18	-2	-2	-18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
64	Sri Lanka	64	0	58	0	5	5	29	0	0	0	5	5	29	-5	-5	-29	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
65	Cameroon	65	53	68	15	6	6	3	3	3	1	3	3	1	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
66	Moldova	66	0	61	0	6	6	1	0	0	0	6	6	1	-6	-6	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
67	Madagascar	67	51	0	0	7	3	5	7	3	5	0	0	0	7	3	5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
68	Jordan	68	0	63	0	3	3	11	0	0	0	3	3	11	-3	-3	-11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
69	Monaco	69	0	65	0	4	4	0	0	0	0	4	4	0	-4	-4	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
70	Ecuador	70	0	66	0	1	1	28	0	0	0	1	1	28	-1	-1	-28	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
71	British Virgin	71	0	67	0	2	2	18	0	0	0	2	2	18	-2	-2	-18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
72	El Salvador	72	0	69	0	2	2	10	0	0	0	2	2	10	-2	-2	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
73	Colombia	73	0	70	0	1	1	24	0	0	0	1	1	24	-1	-1	-24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
74	Netherlands Antilles	74	0	71	0	3	3	1	0	0	0	3	3	1	-3	-3	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
75	Bangladesh	75	0	72	0	1	1	18	0	0	0	1	1	18	-1	-1	-18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
76	Slovenia	76	58	88	30	3	2	1	2	1	1	1	1	0	1	0	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
77	Kazakhstan	77	0	73	0	2	2	5	0	0	0	2	2	5	-2	-2	-5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
78	Egypt	78	0	74	0	2	2	9	0	0	0	2	2	9	-2	-2	-9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
79	Latvia	79	0	76	0	2	2	1	0	0	0	2	2	1	-2	-2	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
80	Tunisia	80	62	87	25	2	2	0	1	1	0	1	1	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
81	Fr Polynesia	81	0	77	0	2	2	0	0	0	0	2	2	0	-2	-2	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
82	Azerbaijan	82	0	78	0	2	2	0	0	0	0	2	2	0	-2	-2	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
83	Fiji	83	0	79	0	2	2	0	0	0	0	2	2	0	-2	-2	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
84	Peru	84	0	80	0	1	1	10	0	0	0	1	1	10	-1	-1	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
85	Saudi Arabia	85	59	0	0	2	1	1	2	1	1	0	0	0	2	1	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
86	Morocco	86	65	90	25	2	1	1	1	1	1	1	1	0	0	0	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
87	Bolivia	87	0	81	0	1	1	3	0	0	0	1	1	3	-1	-1	-3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
88	Macedonia	88	0	82	0	1	1	2	0	0	0	1	1	2	-1	-1	-2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
89	Mozambique	89	0	83	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
90	Sierra Leone	90	0	84	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
91	Venezuela	91	0	85	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
92	Bosnia	92	0	86	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
93	Costa Rica	93	63	0	0	1	1	0	1	1	0	0	0	0	1	1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
93	Kuwait	93	63	0	0	1	1	0	1	1	0	0	0	0	1	1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
	Grand Total					286,761	138,809	983,228	143,381	69,404	491,614	143,381	69,404	491,614				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Appendix 3: Venture Capital cross-border (cross-section analysis)

Nr.	Country	Rank				Absolute volume of deals ($US mln) Overall (Source+Host)			Source			Host			Difference source-host			Percentage of total deals Overall			Source			Host			Activity %		
		O	S	H	Dif	Part.	Dealp.	Dflow	Part.	Dealp.	Dflow	Part.	Dealp.	Dflow	Part.	Dealp.	Dflow	Part.	Dealp.	Dflow	Part.	Dealp.	Dflow	Part.	Dealp.	Dflow	Source	Host	Overall
1	United States of A.	1	1	1	0	13,091	6,261	75,511	5,245	3,228	47,332	7,847	3,033	28,179	-2,602	194	19,153	35.7%	32.4%	34.1%	28.6%	33.4%	42.8%	42.8%	31.4%	25.5%	34.94%	33.23%	34.08%
2	United Kingdom	2	2	2	0	5,764	3,241	40,511	4,157	2,284	28,311	1,608	957	12,200	2,549	1,327	16,110	15.7%	16.8%	18.3%	22.7%	23.6%	25.6%	8.8%	9.9%	11.0%	23.97%	9.90%	16.94%
3	Germany	3	3	4	1	2,276	1,186	10,156	1,124	457	2,988	1,153	729	7,168	-29	-272	-4,180	6.2%	6.1%	4.6%	6.1%	4.7%	2.7%	6.3%	7.5%	6.5%	4.52%	6.77%	5.65%
4	France	4	5	3	-2	1,897	958	12,032	855	359	2,376	1,042	599	9,656	-188	-240	-7,280	5.2%	5.0%	5.4%	4.7%	3.7%	2.1%	5.7%	6.2%	8.7%	3.51%	6.87%	5.19%
5	Canada	5	4	5	1	1,840	736	7,635	1,033	331	3,844	808	405	3,791	225	-74	53	5.0%	3.8%	3.5%	5.6%	3.4%	3.5%	4.4%	4.2%	3.4%	4.18%	4.01%	4.09%
6	Netherlands	6	6	6	0	959	539	7,856	574	313	3,642	385	226	4,213	188	87	-571	2.6%	2.8%	3.6%	3.1%	3.2%	3.3%	2.1%	2.3%	3.8%	3.22%	2.75%	2.99%
7	Israel	7	9	11	2	1,102	497	2,742	616	246	1,579	487	251	1,163	129	-5	416	3.0%	2.6%	1.2%	3.4%	2.5%	1.4%	2.7%	2.6%	1.1%	2.44%	2.10%	2.27%
8	Japan	8	11	8	-3	804	399	5,380	528	175	1,650	276	223	3,730	252	-48	-2,080	2.2%	2.1%	2.4%	2.9%	1.8%	1.5%	1.5%	2.3%	3.4%	2.06%	2.40%	2.23%
9	Sweden	9	12	7	-5	813	508	3,977	322	180	2,229	491	328	1,748	-169	-147	481	2.2%	2.6%	1.8%	1.8%	1.9%	2.0%	2.7%	3.4%	1.6%	1.88%	2.55%	2.22%
10	Switzerland	10	10	12	2	913	469	3,714	541	261	1,543	373	208	2,170	168	53	-627	2.5%	2.4%	1.7%	2.9%	2.7%	1.4%	2.0%	2.2%	2.0%	2.35%	2.05%	2.20%
11	Hong Kong	11	7	21	14	569	367	6,036	379	237	4,793	190	130	1,243	189	107	3,549	1.6%	1.9%	2.7%	2.1%	2.5%	4.3%	1.0%	1.3%	1.1%	2.95%	1.17%	2.06%
12	Singapore	12	8	19	11	784	382	4,175	574	221	3,156	210	161	1,019	365	60	2,137	2.1%	2.0%	1.9%	3.1%	2.3%	2.9%	1.1%	1.7%	0.9%	2.76%	1.24%	2.00%
13	Australia	13	13	16	3	592	426	2,383	351	233	1,327	241	194	1,056	111	39	271	1.6%	2.2%	1.1%	1.9%	2.4%	1.2%	1.3%	2.0%	1.0%	1.84%	1.42%	1.63%
14	China	14	24	9	-15	445	235	3,405	68	32	190	377	203	3,215	-309	-172	-3,025	1.2%	1.2%	1.5%	0.4%	0.3%	0.2%	2.1%	2.1%	2.9%	0.29%	2.36%	1.32%
15	India	15	22	10	-12	327	267	3,339	71	53	314	256	213	3,025	-185	-160	-2,711	0.9%	1.4%	1.5%	0.4%	0.6%	0.3%	1.4%	2.2%	2.7%	0.41%	2.11%	1.26%
16	Denmark	16	16	14	-2	414	246	2,805	162	92	355	252	154	2,450	-90	-62	-2,095	1.1%	1.3%	1.3%	0.9%	0.9%	0.3%	1.4%	1.6%	2.2%	0.72%	1.73%	1.22%
17	South Korea	17	23	15	-8	234	148	3,825	66	30	468	168	118	3,357	-102	-88	-2,889	0.6%	0.8%	1.7%	0.4%	0.3%	0.4%	0.9%	1.2%	3.0%	0.37%	1.73%	1.05%
18	Finland	18	15	20	5	382	240	1,757	180	98	622	202	142	1,136	-22	-44	-514	1.0%	1.2%	0.8%	1.0%	1.0%	0.6%	1.1%	1.5%	1.0%	0.85%	1.20%	1.03%
19	Ireland-Rep	19	25	13	-12	313	189	2,764	65	35	102	248	144	2,662	-183	-109	-2,559	0.9%	0.9%	1.2%	0.4%	0.4%	0.1%	1.4%	1.5%	2.4%	0.27%	1.75%	1.01%
20	Belgium	20	17	18	1	372	194	2,192	168	78	434	204	117	1,759	-36	-39	-1,325	1.0%	1.0%	1.0%	0.9%	0.8%	0.4%	1.1%	1.2%	1.6%	0.70%	1.30%	1.00%
21	Taiwan	21	14	26	12	446	212	1,505	344	131	1,055	102	81	450	243	50	606	1.2%	1.1%	0.7%	1.9%	1.4%	1.0%	0.6%	0.8%	0.4%	1.40%	0.60%	1.00%
22	Italy	22	18	23	5	307	189	1,689	159	79	282	148	110	1,407	11	-31	-1,125	0.8%	1.0%	0.8%	0.9%	0.8%	0.3%	0.8%	1.1%	1.3%	0.65%	1.07%	0.86%
23	Bermuda	23	37	17	-20	94	45	3,765	12	10	42	82	36	3,722	-70	-26	-3,680	0.3%	0.2%	1.7%	0.1%	0.1%	0.0%	0.4%	0.4%	3.4%	0.07%	1.39%	0.73%
24	Spain	24	33	22	-11	192	131	1,506	16	10	205	177	121	1,300	-161	-111	-1,095	0.5%	0.7%	0.7%	0.1%	0.1%	0.2%	1.0%	1.3%	1.2%	0.12%	1.13%	0.63%
25	Luxembourg	25	21	24	3	86	68	2,643	57	47	481	29	20	2,162	28	27	-1,681	0.2%	0.4%	1.2%	0.3%	0.5%	0.4%	0.2%	0.2%	2.0%	0.41%	0.77%	0.59%
26	Norway	26	19	29	10	199	119	650	135	77	231	64	42	420	71	35	-189	0.5%	0.6%	0.3%	0.7%	0.8%	0.2%	0.3%	0.4%	0.4%	0.58%	0.39%	0.48%
27	Malaysia	27	20	28	8	178	128	428	110	70	155	68	58	273	43	12	-119	0.5%	0.7%	0.2%	0.6%	0.7%	0.1%	0.4%	0.6%	0.2%	0.49%	0.41%	0.45%
28	Brazil	28	32	25	-7	125	70	854	31	12	86	94	58	767	-63	-46	-681	0.3%	0.4%	0.4%	0.2%	0.1%	0.1%	0.5%	0.6%	0.7%	0.12%	0.60%	0.36%
29	New Zealand	29	28	31	3	93	79	467	45	36	24	48	43	443	-3	-6	-419	0.3%	0.4%	0.2%	0.2%	0.4%	0.0%	0.3%	0.4%	0.4%	0.21%	0.37%	0.29%
30	Argentina	30	46	27	-19	67	37	1,018	4	4	2	63	34	1,016	-59	-30	-1,015	0.2%	0.2%	0.5%	0.0%	0.0%	0.0%	0.3%	0.3%	0.9%	0.02%	0.54%	0.28%
31	Austria	31	31	30	-1	115	75	235	34	27	42	81	49	193	-47	-22	-151	0.3%	0.4%	0.1%	0.2%	0.3%	0.0%	0.4%	0.5%	0.2%	0.17%	0.37%	0.27%
32	Czech Republic	32	30	34	4	94	71	354	35	25	95	60	46	260	-25	-21	-165	0.3%	0.4%	0.2%	0.2%	0.3%	0.1%	0.3%	0.5%	0.2%	0.18%	0.35%	0.26%
33	Poland	33	27	38	11	75	60	329	42	33	129	33	27	200	10	7	-71	0.2%	0.3%	0.1%	0.2%	0.3%	0.1%	0.2%	0.3%	0.2%	0.23%	0.21%	0.22%
34	Indonesia	34	36	32	-4	67	56	402	16	12	15	51	44	387	-35	-31	-372	0.2%	0.3%	0.2%	0.1%	0.1%	0.0%	0.3%	0.5%	0.3%	0.08%	0.36%	0.22%
35	Philippines	35	35	36	1	62	44	334	21	8	49	41	36	286	-20	-28	-237	0.2%	0.2%	0.2%	0.1%	0.1%	0.0%	0.2%	0.4%	0.3%	0.08%	0.28%	0.18%
36	Hungary	36	40	35	-5	65	50	227	13	8	17	52	42	210	-39	-34	-193	0.2%	0.3%	0.1%	0.1%	0.1%	0.0%	0.3%	0.4%	0.2%	0.06%	0.30%	0.18%
37	Thailand	37	55	33	-22	52	49	297	1	1	5	51	49	292	-50	-48	-287	0.1%	0.3%	0.1%	0.0%	0.0%	0.0%	0.3%	0.5%	0.3%	0.01%	0.35%	0.18%
38	Russian Federation	38	29	41	12	64	48	103	41	26	63	23	23	41	18	3	22	0.2%	0.3%	0.0%	0.2%	0.3%	0.1%	0.1%	0.2%	0.0%	0.18%	0.13%	0.13%
39	Mauritius	39	26	84	58	52	36	162	51	35	162	1	1	0	50	34	162	0.1%	0.2%	0.1%	0.3%	0.4%	0.1%	0.0%	0.0%	0.0%	0.26%	0.01%	0.13%
40	Mexico	40	56	37	-19	37	32	271	1	0	0	36	31	271	-35	-31	-271	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.2%	0.3%	0.2%	0.01%	0.25%	0.13%
41	Romania	41	42	39	-3	37	31	166	7	7	15	30	24	151	-23	-17	-136	0.1%	0.2%	0.1%	0.0%	0.1%	0.0%	0.2%	0.2%	0.1%	0.04%	0.18%	0.11%
42	Portugal	42	41	40	-1	33	22	169	10	7	44	23	15	125	-13	-8	-81	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%	0.2%	0.1%	0.06%	0.13%	0.08%
43	South Africa	43	34	45	11	33	21	88	16	12	41	17	9	46	-1	2	-5	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.08%	0.08%	0.08%
44	Zambia	44	0	42	0	2	2	325	0	0	0	2	2	325	-2	-2	-325	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.00%	0.11%	0.05%
45	Greece	45	38	56	18	19	17	10	13	12	10	6	5	0	7	7	10	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%	0.07%	0.03%	0.05%
46	Chile	46	50	44	-6	15	11	84	3	1	0	12	10	84	-9	-8	-84	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.01%	0.08%	0.04%
47	Bulgaria	47	0	43	0	9	4	167	0	0	0	9	4	167	-9	-4	-167	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.00%	0.08%	0.04%
48	Slovak Republic	48	0	46	0	14	12	24	0	0	0	14	12	24	-14	-12	-24	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.00%	0.07%	0.04%
49	Cayman Islands	49	39	70	31	17	8	28	15	6	26	2	2	1	13	4	25	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.06%	0.01%	0.03%
50	Nigeria	50	47	48	1	8	6	96	3	2	6	5	4	89	-2	-2	-83	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.01%	0.05%	0.03%
51	Croatia	51	0	47	0	11	11	15	0	0	0	11	11	15	-11	-11	-15	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.00%	0.06%	0.03%
52	Iceland	52	44	57	13	14	7	11	5	4	3	9	3	8	-4	2	-5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.02%	0.03%	0.03%
53	Estonia	53	49	52	3	7	5	53	3	1	3	4	4	51	-1	-3	-48	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.04%	0.02%
54	Kenya	54	0	49	0	9	5	31	0	0	0	9	5	31	-9	-5	-31	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.00%	0.04%	0.02%
55	Ghana	55	0	50	0	8	8	4	0	0	0	8	8	4	-8	-8	-4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.00%	0.04%	0.02%
56	Ukraine	56	43	66	23	7	7	10	5	5	1	2	2	9	3	3	-8	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.03%	0.01%	0.02%
57	Tanzania	57	0	51	0	2	2	94	0	0	0	2	2	94	-2	-2	-94	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.00%	0.03%	0.02%
58	Sri Lanka	58	0	53	0	5	5	29	0	0	0	5	5	29	-5	-5	-29	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.00%	0.03%	0.02%
59	Moldova	59	0	54	0	6	6	1	0	0	0	6	6	1	-6	-6	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.00%	0.03%	0.01%
60	Cyprus	60	0	55	0	3	3	45	0	0	0	3	3	45	-3	-3	-45	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.03%	0.01%
61	Pakistan	61	0	58	0	2	2	51	0	0	0	2	2	51	-2	-2	-51	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
62	Madagascar	62	45	0	36	7	3	5	7	3	5	0	0	0	7	3	5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.02%	0.00%	0.01%
63	United Arab Emirates	63	48	84	36	3	3	13	2	2	13	1	1	0	1	1	13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.01%	0.01%
64	Monaco	64	0	59	0	4	4	0	0	0	0	4	4	0	-4	-4	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
65	Jordan	65	0	60	0	3	3	11	0	0	0	3	3	11	-3	-3	-11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
66	Netherlands Antilles	66	0	61	0	3	3	1	0	0	0	3	3	1	-3	-3	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
67	British Virgin	67	0	62	0	2	2	18	0	0	0	2	2	18	-2	-2	-18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
68	Lithuania	68	0	63	0	2	2	18	0	0	0	2	2	18	-2	-2	-18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
69	Slovenia	69	51	84	33	3	2	1	2	1	1	1	1	0	1	0	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.01%	0.01%
70	Ecuador	70	0	64	0	1	1	28	0	0	0	1	1	28	-1	-1	-28	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
71	El Salvador	71	0	65	0	2	2	10	0	0	0	2	2	10	-2	-2	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
72	Kazakhstan	72	0	67	0	2	2	5	0	0	0	2	2	5	-2	-2	-5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
73	Vietnam	73	0	68	0	2	2	4	0	0	0	2	2	4	-2	-2	-4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
74	Egypt	74	0	69	0	2	2	9	0	0	0	2	2	9	-2	-2	-9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
75	Colombia	75	0	71	0	1	1	24	0	0	0	1	1	24	-1	-1	-24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
76	Bangladesh	76	0	72	0	1	1	18	0	0	0	1	1	18	-1	-1	-18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
77	Latvia	77	0	73	0	2	2	2	0	0	0	2	2	2	-2	-2	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
78	Fr Polynesia	78	0	74	0	2	2	0	0	0	0	2	2	0	-2	-2	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
79	Azerbaijan	79	0	75	0	2	2	0	0	0	0	2	2	0	-2	-2	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
80	Fiji	80	0	76	0	2	2	0	0	0	0	2	2	0	-2	-2	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
81	Peru	81	0	77	0	1	1	10	0	0	0	1	1	10	-1	-1	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
82	Saudi Arabia	82	52	0	0	2	1	1	2	1	1	0	0	0	2	1	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.00%	0.00%
83	Bolivia	83	0	78	0	1	1	3	0	0	0	1	1	3	-1	-1	-3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
84	Macedonia	84	0	79	0	1	1	2	0	0	0	1	1	2	-1	-1	-2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
85	Mozambique	85	0	80	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
86	Sierra Leone	86	0	81	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
87	Venezuela	87	0	82	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
88	Bosnia	88	0	83	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
89	Costa Rica	89	53	0	0	1	1	0	1	1	0	0	0	0	1	1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.00%	0.00%
90	Kuwait	89	53	0	0	1	1	0	1	1	0	0	0	0	1	1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.00%	0.00%
91	Turkey	91	0	87	0	1	1	8	0	0	0	1	1	8	-1	-1	-8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.00%
	Grand Total					36,674	19,321	221,127	18,337	9,661	110,564	18,337	9,661	110,564				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Appendix 4: Private equity investments (cross-section analysis)

Nr.	Country	Rank O	S	H	Dif.	Overall (Source+Host) Part.	Dealp.	Dflow	Source Part.	Dealp.	Dflow	Host Part.	Dealp.	Dflow	Diff source-host Part.	Dealp.	Dflow	Overall Part.	Dealp.	Dflow	Source Part.	Dealp.	Dflow	Host Part.	Dealp.	Dflow	Activity % Source	Host	Overall
1	United States of A.	1	1	1	0	77,218	34,606	359,371	38,966	17,689	188,884	38,252	16,917	170,487	714	772	18,307	82.3%	75.9%	83.0%	81.1%	77.6%	82.7%	81.5%	74.2%	74.7%	81.11%	76.79%	78.95%
2	United Kingdom	2	2	2	0	4,291	2,844	36,760	2,359	1,517	21,243	1,932	1,327	15,518	427	191	5,725	4.6%	6.2%	8.0%	5.0%	6.7%	9.3%	4.1%	5.8%	6.8%	7.00%	5.58%	6.29%
3	France	3	3	3	0	2,370	1,396	9,384	950	554	2,746	1,420	842	6,638	-471	-287	-3,892	2.5%	3.1%	2.1%	2.0%	2.4%	1.2%	3.0%	3.7%	2.9%	1.89%	3.21%	2.55%
4	Germany	4	5	4	-1	1,039	646	6,571	423	241	1,662	616	405	4,909	-193	-164	-3,247	1.1%	1.4%	1.4%	0.9%	1.1%	0.7%	1.3%	1.8%	2.1%	0.90%	1.75%	1.32%
5	Australia	5	4	5	1	1,029	826	2,691	491	404	1,036	538	422	1,655	-48	-17	-619	1.1%	1.8%	0.6%	1.0%	1.8%	0.5%	1.1%	1.8%	0.7%	1.09%	1.24%	1.17%
6	Canada	6	7	6	-1	769	367	3,657	322	132	1,658	447	235	1,999	-125	-104	-341	0.8%	0.8%	0.8%	0.7%	0.6%	0.7%	1.0%	1.0%	0.9%	0.66%	0.95%	0.81%
7	Netherlands	7	9	8	-1	477	264	4,159	231	128	1,294	247	136	2,865	-16	-8	-1,571	0.5%	0.6%	0.9%	0.5%	0.6%	0.6%	0.5%	0.6%	1.3%	0.54%	0.79%	0.67%
8	Sweden	8	8	9	1	573	439	1,626	252	197	545	321	242	1,081	-69	-46	-536	0.6%	1.0%	0.4%	0.5%	0.9%	0.2%	0.7%	1.1%	0.5%	0.55%	0.74%	0.64%
9	Belgium	9	6	11	5	638	364	1,738	403	214	932	235	151	807	168	63	125	0.7%	0.8%	0.4%	0.9%	0.9%	0.4%	0.5%	0.7%	0.4%	0.73%	0.50%	0.62%
10	South Korea	10	15	7	-8	474	325	2,594	209	142	208	265	182	2,386	-56	-40	-2,179	0.5%	0.7%	0.6%	0.4%	0.6%	0.1%	0.6%	0.8%	1.0%	0.39%	0.80%	0.60%
11	Brazil	11	10	10	0	274	246	2,995	127	119	1,437	147	127	1,557	-21	-8	-120	0.3%	0.5%	0.7%	0.3%	0.5%	0.6%	0.3%	0.6%	0.7%	0.47%	0.52%	0.50%
12	Israel	12	13	12	-1	528	242	1,249	260	103	559	268	139	690	-8	-36	-130	0.6%	0.5%	0.3%	0.6%	0.5%	0.2%	0.6%	0.6%	0.3%	0.42%	0.49%	0.46%
13	Finland	13	14	20	6	361	282	762	186	149	339	175	133	424	11	16	-85	0.4%	0.6%	0.2%	0.4%	0.7%	0.1%	0.4%	0.6%	0.2%	0.40%	0.38%	0.39%
14	India	14	19	13	-6	322	272	1,051	132	109	259	190	163	792	-58	-54	-533	0.3%	0.6%	0.2%	0.3%	0.5%	0.1%	0.4%	0.7%	0.3%	0.29%	0.49%	0.39%
15	Japan	15	16	17	1	286	135	2,599	199	76	868	87	59	1,731	112	16	-862	0.3%	0.3%	0.6%	0.4%	0.3%	0.4%	0.2%	0.3%	0.8%	0.38%	0.40%	0.39%
16	Hong Kong	16	11	22	11	252	189	1,995	146	116	1,180	106	73	815	40	42	365	0.3%	0.4%	0.4%	0.3%	0.5%	0.5%	0.2%	0.3%	0.4%	0.44%	0.30%	0.37%
17	Ireland-Rep	17	18	14	-4	313	219	1,358	153	112	223	159	107	1,135	-6	6	-912	0.3%	0.5%	0.3%	0.3%	0.5%	0.1%	0.3%	0.5%	0.5%	0.31%	0.44%	0.37%
18	Taiwan	18	12	23	11	340	247	907	222	144	493	118	103	414	103	41	79	0.4%	0.5%	0.2%	0.5%	0.6%	0.2%	0.3%	0.5%	0.2%	0.44%	0.30%	0.37%
19	Switzerland	19	17	21	4	308	183	998	167	97	348	141	88	649	25	9	-301	0.3%	0.4%	0.2%	0.3%	0.4%	0.2%	0.3%	0.4%	0.3%	0.33%	0.32%	0.32%
20	Singapore	20	20	19	-1	168	130	2,149	94	72	451	74	59	1,698	20	13	-1,246	0.2%	0.3%	0.5%	0.2%	0.3%	0.2%	0.2%	0.3%	0.7%	0.24%	0.39%	0.31%
21	Italy	21	25	16	-9	158	118	1,580	40	29	166	119	89	1,413	-79	-61	-1,247	0.2%	0.3%	0.3%	0.1%	0.1%	0.1%	0.3%	0.4%	0.6%	0.09%	0.42%	0.26%
22	Denmark	22	22	25	3	206	143	659	100	71	152	106	72	507	-5	-1	-355	0.2%	0.3%	0.1%	0.2%	0.3%	0.1%	0.2%	0.3%	0.2%	0.20%	0.25%	0.23%
23	Spain	23	23	24	1	157	108	1,166	53	41	472	104	67	694	-51	-27	-222	0.2%	0.2%	0.3%	0.1%	0.2%	0.2%	0.2%	0.3%	0.3%	0.17%	0.27%	0.22%
24	Bermuda	24	42	15	-27	38	12	2,647	3	1	20	35	11	2,627	-32	-10	-2,608	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.1%	0.0%	1.2%	0.01%	0.42%	0.22%
25	China	25	34	18	-16	161	105	1,041	15	14	5	146	92	1,036	-131	-78	-1,031	0.2%	0.2%	0.2%	0.0%	0.1%	0.0%	0.3%	0.4%	0.5%	0.03%	0.39%	0.21%
26	Norway	26	21	26	5	201	143	434	102	71	214	99	72	221	4	-1	-7	0.2%	0.3%	0.1%	0.2%	0.3%	0.1%	0.2%	0.3%	0.1%	0.21%	0.21%	0.21%
27	Poland	27	28	27	-1	118	110	157	35	34	32	83	76	125	-48	-42	-93	0.1%	0.2%	0.0%	0.1%	0.1%	0.0%	0.2%	0.3%	0.1%	0.08%	0.19%	0.13%
28	Luxembourg	28	26	29	3	96	31	845	75	20	57	21	11	787	54	9	-730	0.1%	0.1%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	0.3%	0.09%	0.15%	0.12%
29	Austria	29	29	28	-1	106	75	233	32	25	38	75	51	194	-43	-26	-156	0.1%	0.2%	0.1%	0.1%	0.1%	0.0%	0.2%	0.2%	0.1%	0.06%	0.16%	0.11%
30	New Zealand	30	30	30	0	75	64	331	25	21	99	50	43	233	-25	-21	-134	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%	0.2%	0.1%	0.06%	0.13%	0.10%
31	South Africa	31	27	31	4	44	32	788	16	13	373	28	19	415	-12	-5	-42	0.0%	0.1%	0.2%	0.0%	0.1%	0.2%	0.1%	0.1%	0.2%	0.09%	0.11%	0.10%
32	Czech Republic	32	24	33	9	72	66	140	43	40	41	30	26	99	13	15	-57	0.1%	0.1%	0.0%	0.1%	0.2%	0.0%	0.1%	0.1%	0.0%	0.10%	0.07%	0.08%
33	Malaysia	33	32	32	0	56	50	64	22	19	16	34	32	48	-13	-13	-33	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%	0.1%	0.1%	0.0%	0.05%	0.08%	0.06%
34	Portugal	34	33	34	1	38	30	181	15	14	11	23	16	171	-8	-3	-160	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.1%	0.03%	0.07%	0.05%
35	Greece	35	31	40	9	25	19	286	13	10	168	12	10	118	1	0	51	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.05%	0.04%	0.04%
36	Thailand	36	36	35	-1	29	28	138	7	7	49	22	22	89	-15	-15	-41	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.02%	0.06%	0.04%
37	Hungary	37	38	38	0	28	21	93	7	7	5	21	14	88	-14	-8	-83	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.02%	0.05%	0.03%
38	Vietnam	38	35	42	7	26	26	35	13	13	17	13	13	17	0	0	0	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.03%	0.03%	0.03%
39	Indonesia	39	48	36	-12	20	18	130	1	1	0	19	17	130	-18	-16	-130	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.00%	0.06%	0.03%
40	Argentina	40	45	37	-8	26	18	96	2	1	5	24	17	90	-22	-16	-85	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.00%	0.05%	0.02%
41	Philippines	41	0	39	0	13	9	134	0	0	0	13	9	134	-13	-9	-134	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.00%	0.04%	0.02%
42	Russian Federation	42	40	45	5	16	13	61	5	4	4	11	9	58	-6	-5	-54	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.03%	0.02%
43	Slovak Republic	43	39	47	8	18	17	10	6	6	3	12	11	8	-6	-5	-5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.03%	0.02%
44	Cayman Islands	44	0	41	0	1	1	240	0	0	0	1	1	240	-1	-1	-240	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.00%	0.04%	0.02%
45	Sri Lanka	45	41	46	5	16	16	9	4	4	0	12	12	9	-8	-8	-8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.01%	0.03%	0.02%
46	Chile	46	0	43	0	10	8	82	0	0	0	10	8	82	-10	-8	-82	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.03%	0.02%
47	Mexico	47	0	44	0	12	10	56	0	0	0	12	10	56	-12	-10	-56	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.03%	0.02%
48	Romania	48	0	48	0	8	7	66	0	0	0	8	7	66	-8	-7	-66	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.03%	0.01%
49	Netherlands Antilles	49	37	59	22	10	10	11	8	8	8	2	2	3	6	7	5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.02%	0.00%	0.01%
50	Bulgaria	50	0	49	0	9	5	59	0	0	0	9	5	59	-9	-5	-59	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
51	Nigeria	51	0	50	0	4	3	90	0	0	0	4	3	90	-4	-3	-90	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
52	Lithuania	52	48	51	3	7	6	33	1	1	0	6	5	33	-5	-4	-33	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
53	Estonia	53	0	52	0	6	6	5	0	0	0	6	6	5	-6	-6	-5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
54	Iceland	54	0	53	0	5	3	30	0	0	0	5	3	30	-5	-3	-30	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
55	Kenya	55	0	54	0	6	5	11	0	0	0	6	5	11	-6	-5	-11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
56	Morocco	56	44	56	12	5	4	19	2	2	4	3	3	14	-1	-1	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
57	Turkey	57	0	55	0	4	3	18	0	0	0	4	3	18	-4	-3	-18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
58	Colombia	58	0	57	0	2	2	22	0	0	0	2	2	22	-2	-2	-22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
59	Cyprus	59	0	58	0	2	2	16	0	0	0	2	2	16	-2	-2	-16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
60	Senegal	60	43	0	0	2	2	2	2	2	2	0	0	0	2	2	2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
61	Tunisia	61	47	64	17	2	2	1	1	1	1	1	1	1	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
62	United Arab Emirates	62	0	60	0	1	1	7	0	0	0	1	1	7	-1	-1	-7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
63	Croatia	63	0	61	0	1	1	6	0	0	0	1	1	6	-1	-1	-6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
64	Madagascar	64	46	0	0	2	1	4	2	1	4	0	0	0	2	1	4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
65	Algeria	65	0	62	0	1	1	4	0	0	0	1	1	4	-1	-1	-4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
66	British Virgin	66	0	63	0	1	1	7	0	0	0	1	1	7	-1	-1	-7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
67	Latvia	67	0	65	0	1	1	0	0	0	0	1	1	0	-1	-1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
68	Fr Polynesia	67	0	65	0	1	1	0	0	0	0	1	1	0	-1	-1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
69	Costa Rica	67	0	65	0	1	1	0	0	0	0	1	1	0	-1	-1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
70	Dominica	67	0	65	0	1	1	0	0	0	0	1	1	0	-1	-1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
71	Nicaragua	67	0	65	0	1	1	0	0	0	0	1	1	0	-1	-1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
72	Uganda	67	0	65	0	1	1	0	0	0	0	1	1	0	-1	-1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
73	Pakistan	73	0	71	0	1	1	0	0	0	0	1	1	0	-1	-1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
74	Egypt	73	0	71	0	1	1	0	0	0	0	1	1	0	-1	-1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
75	Monaco	75	0	73	0	1	1	0	0	0	0	1	1	0	-1	-1		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00%
	Grand Total					93,877	45,586	456,663	46,938	22,793	228,331	46,938	22,793	228,331				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Appendix 5: Private equity investments cross-border (cross-section analysis)

Nr.	Country	O	S	H	Dif	Overall Part.	Overall Dealp.	Overall Dflow	Source Part.	Source Dealp.	Source Dflow	Host Part.	Host Dealp.	Host Dflow	Diff Part.	Diff Dealp.	Diff Dflow	O% Part.	O% Dealp.	O% Dflow	S% Part.	S% Dealp.	S% Dflow	H% Part.	H% Dealp.	H% Dflow	Act Source	Act Host	Act Overall
1	United States of A.	1	1	1	0	4,951	2,529	37,701	2,832	1,651	28,049	2,118	879	9,652	714	772	18,397	38.3%	35.4%	39.5%	43.8%	46.2%	58.8%	32.7%	24.6%	20.2%	49.60%	25.86%	37.73%
2	United Kingdom	2	2	2	0	2,088	1,180	16,395	1,257	685	11,060	830	494	5,335	427	191	5,725	16.1%	16.5%	17.2%	19.4%	19.2%	23.2%	12.8%	13.8%	11.2%	20.60%	12.62%	16.61%
3	France	3	10	3	-7	796	441	4,836	163	77	472	633	364	4,364	-471	-287	-3,892	6.1%	6.2%	5.1%	2.5%	2.1%	1.0%	9.8%	10.2%	9.1%	1.88%	9.71%	5.80%
4	Germany	4	4	4	0	590	335	4,972	198	85	862	391	249	4,109	-193	-164	-3,247	4.6%	4.7%	5.2%	3.1%	2.4%	1.8%	6.0%	7.0%	8.6%	2.42%	7.22%	4.82%
5	Canada	5	6	5	-1	444	212	3,068	160	54	1,364	285	158	1,704	-125	-104	-341	3.4%	3.0%	3.2%	2.5%	1.5%	2.9%	4.4%	4.4%	3.6%	2.28%	4.13%	3.21%
6	Netherlands	6	5	6	1	355	184	3,482	170	88	955	186	96	2,526	-16	-8	-1,571	2.7%	2.6%	3.6%	2.6%	2.5%	2.0%	2.9%	2.7%	5.3%	2.36%	3.62%	2.99%
7	Belgium	7	3	19	16	334	158	1,262	251	111	694	83	47	569	168	63	125	2.6%	2.2%	1.3%	3.9%	3.1%	1.5%	1.3%	1.3%	1.2%	2.81%	1.27%	2.04%
8	Japan	8	8	15	7	242	102	2,212	177	59	675	65	43	1,537	112	16	-862	1.9%	1.4%	2.3%	2.7%	1.7%	1.4%	1.0%	1.2%	3.2%	1.94%	1.81%	1.87%
9	Israel	9	12	11	-1	321	152	784	156	58	327	164	94	457	-8	-36	-130	2.5%	2.1%	0.8%	2.4%	1.6%	0.7%	2.5%	2.6%	1.0%	1.58%	2.04%	1.81%
10	Switzerland	10	11	16	5	264	155	938	145	82	318	119	73	620	25	9	-301	2.0%	2.2%	1.0%	2.2%	2.3%	0.7%	1.8%	2.1%	1.3%	1.73%	1.73%	1.73%
11	Hong Kong	11	7	18	11	196	142	1,565	118	92	965	78	50	600	40	42	365	1.5%	2.0%	1.6%	1.8%	2.6%	2.0%	1.2%	1.4%	1.3%	2.14%	1.28%	1.71%
12	Sweden	12	15	8	-7	219	142	974	75	48	219	144	94	755	-69	-46	-536	1.7%	2.0%	1.0%	1.2%	1.3%	0.5%	2.2%	2.6%	1.6%	0.99%	2.15%	1.57%
13	Australia	13	14	13	-1	210	140	956	81	61	169	129	79	787	-48	-17	-619	1.6%	2.0%	1.0%	1.3%	1.7%	0.4%	2.0%	2.2%	1.6%	1.11%	1.95%	1.53%
14	Singapore	14	13	14	1	145	108	1,776	82	60	265	63	47	1,511	20	13	-1,246	1.1%	1.5%	1.9%	1.3%	1.7%	0.6%	1.0%	1.3%	3.2%	1.17%	1.82%	1.50%
15	Taiwan	15	9	22	13	212	135	775	158	88	427	55	47	348	103	41	79	1.6%	1.9%	0.8%	2.4%	2.5%	0.9%	0.8%	1.3%	0.7%	1.93%	0.96%	1.45%
16	South Korea	16	23	7	-16	96	57	2,268	20	9	45	76	48	2,224	-56	-40	-2,179	0.7%	0.8%	2.4%	0.3%	0.2%	0.1%	1.2%	1.4%	4.7%	0.22%	2.40%	1.31%
17	Italy	17	24	12	-12	103	75	1,349	12	7	51	91	68	1,298	-79	-61	-1,247	0.8%	1.0%	1.4%	0.2%	0.2%	0.1%	1.4%	1.9%	2.7%	0.16%	2.01%	1.09%
18	Bermuda	18	32	10	-22	38	12	2,647	3	1	20	35	11	2,627	-32	-10	-2,608	0.3%	0.2%	2.8%	0.0%	0.0%	0.0%	0.5%	0.3%	5.5%	0.04%	2.12%	1.08%
19	China	19	41	9	-32	133	78	1,036	1	0	3	132	78	1,033	-131	-78	-1,031	1.0%	1.1%	1.1%	0.0%	0.0%	0.0%	2.0%	2.2%	2.2%	0.01%	2.13%	1.07%
20	Ireland-Rep	20	18	20	2	104	63	1,098	49	34	93	55	29	1,005	-6	6	-912	0.8%	0.9%	1.2%	0.8%	1.0%	0.2%	0.9%	0.8%	2.1%	0.64%	1.25%	0.94%
21	India	21	22	17	-5	116	80	652	29	13	59	87	67	592	-58	-54	-533	0.9%	1.1%	0.7%	0.4%	0.4%	0.1%	1.3%	1.9%	1.2%	0.31%	1.49%	0.90%
22	Finland	22	16	23	7	133	93	306	72	54	111	61	38	195	11	16	-85	1.0%	1.3%	0.3%	1.1%	1.5%	0.2%	0.9%	1.1%	0.4%	0.96%	0.81%	0.88%
23	Denmark	23	17	21	4	121	75	577	58	37	111	63	38	466	-5	-1	-355	0.9%	1.1%	0.6%	0.9%	1.0%	0.2%	1.0%	1.1%	1.0%	0.72%	1.01%	0.86%
24	Luxembourg	24	19	24	5	94	29	844	74	19	57	20	10	787	54	9	-730	0.7%	0.4%	0.9%	1.1%	0.5%	0.1%	0.3%	0.3%	1.6%	0.60%	0.74%	0.67%
25	Norway	25	20	28	8	80	50	227	42	25	110	38	25	117	4	-1	-7	0.6%	0.7%	0.2%	0.6%	0.7%	0.2%	0.6%	0.7%	0.2%	0.52%	0.52%	0.52%
26	Spain	26	30	26	-4	60	31	285	5	2	31	56	29	254	-51	-27	-222	0.5%	0.4%	0.3%	0.1%	0.1%	0.1%	0.9%	0.8%	0.5%	0.07%	0.73%	0.40%
27	Austria	27	28	27	-1	59	37	171	8	6	8	51	32	164	-43	-26	-156	0.5%	0.5%	0.2%	0.1%	0.2%	0.0%	0.8%	0.9%	0.3%	0.10%	0.67%	0.39%
28	Poland	28	33	25	-8	52	46	103	2	2	5	50	44	98	-48	-42	-93	0.4%	0.6%	0.1%	0.0%	0.1%	0.0%	0.8%	1.2%	0.2%	0.03%	0.73%	0.38%
29	Czech Republic	29	21	36	15	42	38	88	28	26	15	15	11	72	13	15	-57	0.3%	0.5%	0.1%	0.4%	0.7%	0.0%	0.2%	0.3%	0.2%	0.40%	0.23%	0.31%
30	New Zealand	30	29	29	0	33	25	292	4	2	79	29	23	213	-25	-21	-134	0.3%	0.3%	0.3%	0.1%	0.1%	0.2%	0.4%	0.5%	0.5%	0.09%	0.51%	0.30%
31	Brazil	31	25	30	5	41	26	159	10	9	20	31	17	140	-21	-8	-120	0.3%	0.4%	0.2%	0.2%	0.3%	0.0%	0.5%	0.5%	0.3%	0.15%	0.41%	0.28%
32	Argentina	32	37	31	-6	26	18	96	2	1	5	24	17	90	-22	-16	-85	0.2%	0.3%	0.1%	0.0%	0.0%	0.0%	0.4%	0.5%	0.2%	0.02%	0.34%	0.18%
33	Indonesia	33	0	32	0	18	16	130	0	0	0	18	16	130	-18	-16	-130	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.3%	0.5%	0.3%	0.00%	0.34%	0.17%
34	Malaysia	34	31	35	4	19	17	38	3	2	2	16	15	35	-13	-13	-33	0.1%	0.2%	0.0%	0.0%	0.1%	0.0%	0.2%	0.4%	0.1%	0.04%	0.24%	0.14%
35	Hungary	35	35	37	2	18	12	85	2	2	1	16	10	84	-14	-8	-83	0.1%	0.2%	0.0%	0.0%	0.1%	0.0%	0.2%	0.3%	0.2%	0.03%	0.23%	0.13%
36	Thailand	36	0	33	0	15	15	41	0	0	0	15	15	41	-15	-15	-41	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.2%	0.4%	0.1%	0.00%	0.25%	0.12%
37	Philippines	37	0	34	0	13	9	134	0	0	0	13	9	134	-13	-9	-134	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.2%	0.3%	0.3%	0.00%	0.24%	0.12%
38	Greece	38	26	48	22	17	11	55	9	6	53	8	6	2	1	0	51	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%	0.2%	0.0%	0.14%	0.09%	0.12%
39	Portugal	39	39	38	-1	10	5	160	1	1	0	9	4	160	-8	-3	-160	0.1%	0.1%	0.2%	0.0%	0.0%	0.0%	0.1%	0.1%	0.3%	0.01%	0.19%	0.10%
40	Mexico	40	0	39	0	12	10	56	0	0	0	12	10	56	-12	-10	-56	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.2%	0.3%	0.1%	0.00%	0.19%	0.09%
41	Chile	41	0	40	0	10	8	82	0	0	0	10	8	82	-10	-8	-82	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%	0.00%	0.18%	0.09%
42	Cayman Islands	42	0	41	0	1	1	240	0	0	0	1	1	240	-1	-1	-240	0.1%	0.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.00%	0.18%	0.09%
43	Russian Federation	43	36	44	8	10	7	61	2	1	4	8	6	58	-6	-5	-54	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	0.2%	0.1%	0.03%	0.14%	0.08%
44	Sri Lanka	44	39	45	6	10	10	8	1	1	0	9	9	8	-8	-8	-8	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%	0.01%	0.14%	0.08%
45	Romania	45	0	42	0	8	7	66	0	0	0	8	7	66	-8	-7	-66	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	0.2%	0.1%	0.00%	0.15%	0.08%
46	Netherlands Antilles	46	27	57	30	10	10	11	8	8	8	2	2	3	6	7	5	0.1%	0.1%	0.0%	0.1%	0.2%	0.0%	0.0%	0.1%	0.0%	0.12%	0.03%	0.07%
47	South Africa	47	0	43	0	12	5	42	0	0	0	12	5	42	-12	-5	-42	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.1%	0.00%	0.14%	0.07%
48	Bulgaria	48	0	46	0	9	5	59	0	0	0	9	5	59	-9	-5	-59	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.00%	0.13%	0.07%
49	Nigeria	49	0	47	0	4	3	90	0	0	0	4	3	90	-4	-3	-90	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.00%	0.11%	0.06%
50	Estonia	50	0	49	0	6	6	5	0	0	0	6	6	5	-6	-6	-5	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.0%	0.00%	0.09%	0.05%
51	Kenya	51	0	50	0	6	5	11	0	0	0	6	5	11	-6	-5	-11	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.00%	0.08%	0.04%
52	Lithuania	52	0	51	0	5	4	33	0	0	0	5	4	33	-5	-4	-33	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.00%	0.08%	0.04%
53	Slovak Republic	53	0	52	0	6	5	5	0	0	0	6	5	5	-6	-5	-5	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.00%	0.08%	0.04%
54	Iceland	54	0	53	0	5	3	30	0	0	0	5	3	30	-5	-3	-30	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.00%	0.08%	0.04%
55	Turkey	55	0	54	0	4	3	18	0	0	0	4	3	18	-4	-3	-18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.00%	0.06%	0.03%
56	Cyprus	56	0	55	0	2	2	16	0	0	0	2	2	16	-2	-2	-16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.00%	0.04%	0.02%
57	Colombia	57	0	56	0	2	2	22	0	0	0	2	2	22	-2	-2	-22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.00%	0.04%	0.02%
58	Senegal	58	34	0		2	2	2	2	2	2	0	0	0	2	2	2	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.03%	0.00%	0.02%
59	Morocco	59	0	58	0	1	1	10	0	0	0	1	1	10	-1	-1	-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
60	Madagascar	60	38	0		2	1	4	2	1	4	0	0	0	2	1	4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.02%	0.00%	0.01%
61	United Arab Emirates	61	0	59	0	1	1	7	0	0	0	1	1	7	-1	-1	-7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
62	Croatia	62	0	60	0	1	1	6	0	0	0	1	1	6	-1	-1	-6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.02%	0.01%
63	Algeria	63	0	61	0	1	1	4	0	0	0	1	1	4	-1	-1	-4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
64	British Virgin	64	0	62	0	1	1	7	0	0	0	1	1	7	-1	-1	-7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
65	Latvia	65	0	63	0	1	1	0	0	0	0	1	1	0	-1	-1		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
66	Fr Polynesia	65	0	63	0	1	1	0	0	0	0	1	1	0	-1	-1		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
67	Costa Rica	65	0	63	0	1	1	0	0	0	0	1	1	0	-1	-1		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
68	Dominica	65	0	63	0	1	1	0	0	0	0	1	1	0	-1	-1		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
69	Nicaragua	65	0	63	0	1	1	0	0	0	0	1	1	0	-1	-1		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
70	Uganda	65	0	63	0	1	1	0	0	0	0	1	1	0	-1	-1		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
71	Pakistan	71	0	69	0	1	1	1	0	0	0	1	1	1	-1	-1	-1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
72	Egypt	71	0	69	0	1	1	0	0	0	0	1	1	0	-1	-1		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
73	Monaco	73	0	71	0	1	1	0	0	0	0	1	1	0	-1	-1		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%	0.01%	0.01%
	Grand Total					12,940	7,141	95,432	6,470	3,571	47,716	6,470	3,571	47,716				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Appendix 6: Correlation of host investment

Country	United States				United Kingdom				Hong Kong			
Correlation	Over all	1991-1995	1996-2000	2001-2005	Over all	1991-1995	1996-2000	2001-2005	Over all	1991-1995	1996-2000	2001-2005
H_0 to CB	0.43	0.39	0.85	0.55	-0.09	0.31	0.48	0.66	0.53	0.92	0.86	-0.42
H_1 to H_0	0.27	-0.55	0.77	0.41	-0.11	0.78	0.68	0.23	0.36	0.00	1.00	-0.26
H_1 to H_2	0.08	-0.89	0.46	-0.02	0.14	0.38	-0.02	0.04	0.57	0.00	0.28	0.87
H_1 to H_R	0.00	-0.38	0.70	0.75	-0.02	-0.37	-0.22	-0.60	0.18	0.00	0.81	-0.03

H_0 to CB: Domestic to cross-border investment

H_1 to H_0: Tier one host country to domestic investment

H_1 to H_2: Tier one host country to tier two host country investment

H_1 to H_R: Tier one host country to rest of host country investment

Appendix 7: Country pairs (overall investment) 1-100

	Investment country pairs: Cross-border and domestic for all investments (1980-2005)								1/3	
CB	Nr.	Source	Host	Participation	Deal part.	Deal flow	% Participation	% Deal particip.	%Deal flow	Activity
	1	United States of America	United States of America	144,102	63,577	489,490	75.716%	68.957%	67.990%	70.888%
	2	United Kingdom	United Kingdom	5,168	3,847	34,869	2.715%	4.172%	4.843%	3.910%
	3	France	France	3,466	2,105	8,263	1.821%	2.283%	1.148%	1.751%
1	4	United Kingdom	United States of America	2,939	1,205	16,424	1.544%	1.307%	2.281%	1.711%
2	5	United States of America	United Kingdom	1,677	1,026	14,857	0.881%	1.113%	2.064%	1.352%
	6	Australia	Australia	1,546	1,295	3,409	0.812%	1.404%	0.473%	0.897%
	7	Germany	Germany	1,470	980	2,548	0.772%	1.063%	0.354%	0.730%
	8	South Korea	South Korea	1,353	1,071	1,488	0.711%	1.162%	0.207%	0.693%
	9	Canada	Canada	1,433	720	2,924	0.753%	0.781%	0.406%	0.647%
3	10	United States of America	Canada	949	489	5,102	0.499%	0.530%	0.709%	0.579%
4	11	United States of America	France	687	355	6,758	0.361%	0.385%	0.939%	0.562%
5	12	Canada	United States of America	1,122	355	4,792	0.590%	0.385%	0.666%	0.547%
	13	India	India	854	791	1,383	0.449%	0.858%	0.192%	0.499%
6	14	United Kingdom	Germany	552	413	5,256	0.290%	0.448%	0.730%	0.489%
	15	Sweden	Sweden	842	606	2,379	0.442%	0.658%	0.330%	0.477%
7	16	United Kingdom	France	580	407	4,756	0.305%	0.441%	0.661%	0.469%
8	17	United States of America	Germany	587	330	4,901	0.308%	0.358%	0.681%	0.449%
9	18	Germany	United States of America	910	341	2,712	0.478%	0.370%	0.377%	0.408%
10	19	United States of America	Japan	289	227	4,468	0.152%	0.246%	0.621%	0.339%
	20	Finland	Finland	639	544	656	0.336%	0.590%	0.091%	0.339%
11	21	United States of America	Bermuda	105	44	5,798	0.055%	0.047%	0.805%	0.303%
12	22	Israel	United States of America	709	280	1,612	0.373%	0.304%	0.224%	0.300%
	23	Israel	Israel	586	282	1,287	0.308%	0.306%	0.179%	0.264%
13	24	United States of America	Netherlands	323	164	2,962	0.170%	0.178%	0.411%	0.253%
14	25	Japan	United States of America	587	179	1,845	0.308%	0.194%	0.256%	0.253%
	26	Netherlands	Netherlands	472	354	794	0.248%	0.383%	0.110%	0.247%
15	27	France	United States of America	576	191	1,388	0.303%	0.207%	0.193%	0.234%
	28	Denmark	Denmark	481	329	542	0.253%	0.357%	0.075%	0.228%
16	29	United States of America	China	306	169	2,317	0.161%	0.183%	0.322%	0.222%
17	30	United Kingdom	Netherlands	132	92	3,361	0.069%	0.100%	0.467%	0.212%
18	31	United States of America	Israel	422	225	1,132	0.222%	0.245%	0.157%	0.208%
	32	Brazil	Brazil	248	232	1,713	0.130%	0.252%	0.238%	0.207%
19	33	Taiwan	United States of America	444	186	1,261	0.233%	0.202%	0.175%	0.203%
20	34	United States of America	South Korea	152	105	2,858	0.080%	0.114%	0.397%	0.197%
	35	Japan	Japan	148	113	2,667	0.078%	0.122%	0.370%	0.190%
21	36	United States of America	India	202	164	2,035	0.106%	0.178%	0.283%	0.189%
22	37	United States of America	Ireland-Rep	152	85	2,621	0.080%	0.093%	0.364%	0.179%
23	38	Netherlands	United States of America	250	100	1,950	0.131%	0.108%	0.271%	0.170%
24	39	Singapore	United States of America	371	118	1,184	0.195%	0.128%	0.164%	0.162%
	40	Belgium	Belgium	326	232	354	0.171%	0.252%	0.049%	0.157%
	41	Ireland-Rep	Ireland-Rep	314	226	380	0.165%	0.245%	0.053%	0.154%
25	42	United States of America	Australia	241	177	996	0.127%	0.192%	0.138%	0.152%
	43	Spain	Spain	217	171	1,124	0.114%	0.185%	0.156%	0.152%
26	44	Switzerland	United States of America	355	137	859	0.187%	0.148%	0.119%	0.151%
27	45	United States of America	Singapore	133	104	1,773	0.070%	0.113%	0.246%	0.143%
28	46	United States of America	Luxembourg	28	18	2,782	0.015%	0.019%	0.386%	0.140%
29	47	United States of America	Hong Kong	185	121	1,296	0.097%	0.132%	0.180%	0.136%
	48	Italy	Italy	175	141	1,169	0.092%	0.153%	0.162%	0.136%
30	49	Australia	United States of America	297	183	379	0.156%	0.198%	0.053%	0.136%
31	50	United States of America	Switzerland	189	101	1,334	0.099%	0.110%	0.185%	0.132%
32	51	United Kingdom	Sweden	186	137	991	0.098%	0.148%	0.138%	0.128%
	52	Norway	Norway	218	175	447	0.115%	0.190%	0.062%	0.122%
33	53	United States of America	Sweden	181	102	962	0.095%	0.111%	0.134%	0.113%
34	54	Hong Kong	South Korea	44	30	2,034	0.023%	0.032%	0.283%	0.113%
35	55	United States of America	Italy	96	62	1,418	0.050%	0.068%	0.197%	0.105%
	56	Switzerland	Switzerland	225	140	324	0.118%	0.152%	0.045%	0.105%
	57	Hong Kong	Hong Kong	128	103	935	0.067%	0.112%	0.130%	0.103%
36	58	Netherlands	United Kingdom	157	106	787	0.082%	0.115%	0.109%	0.102%
37	59	United States of America	Denmark	75	39	1,478	0.039%	0.043%	0.205%	0.096%
38	60	United Kingdom	Spain	96	69	1,138	0.050%	0.075%	0.158%	0.094%
	61	Taiwan	Taiwan	169	145	234	0.089%	0.157%	0.033%	0.093%
39	62	United States of America	Belgium	114	63	1,016	0.060%	0.068%	0.141%	0.090%
	63	Singapore	Singapore	134	102	601	0.070%	0.111%	0.084%	0.088%
40	64	United States of America	Brazil	117	71	864	0.061%	0.078%	0.120%	0.086%
41	65	United Kingdom	Ireland-Rep	102	64	904	0.054%	0.069%	0.126%	0.083%
42	66	United Kingdom	Italy	79	62	980	0.042%	0.068%	0.136%	0.082%
	67	Austria	Austria	156	119	158	0.082%	0.129%	0.022%	0.078%
43	68	United States of America	Argentina	67	34	1,050	0.035%	0.037%	0.146%	0.073%
44	69	Belgium	United States of America	173	72	335	0.091%	0.078%	0.046%	0.072%
45	70	United Kingdom	Finland	101	78	551	0.053%	0.085%	0.076%	0.071%
46	71	United Kingdom	Switzerland	93	65	665	0.049%	0.070%	0.092%	0.071%
47	72	Hong Kong	United States of America	123	52	611	0.065%	0.056%	0.085%	0.069%
48	73	Sweden	United States of America	134	51	484	0.070%	0.055%	0.067%	0.064%
49	74	United States of America	Taiwan	97	80	385	0.051%	0.087%	0.053%	0.064%
	75	China	China	113	84	173	0.059%	0.092%	0.024%	0.058%
50	76	Hong Kong	China	62	36	722	0.033%	0.039%	0.100%	0.057%
51	77	United Kingdom	Belgium	51	34	748	0.027%	0.037%	0.104%	0.056%
52	78	Netherlands	France	64	32	621	0.034%	0.035%	0.086%	0.052%
53	79	Singapore	India	32	26	785	0.017%	0.028%	0.109%	0.051%
	80	New Zealand	New Zealand	86	78	130	0.045%	0.084%	0.018%	0.049%
54	81	United Kingdom	Denmark	55	43	477	0.029%	0.046%	0.066%	0.047%
55	82	Australia	New Zealand	48	43	488	0.025%	0.046%	0.068%	0.046%
56	83	Sweden	Finland	60	45	409	0.032%	0.049%	0.057%	0.046%
57	84	Belgium	France	70	32	460	0.037%	0.034%	0.064%	0.045%
58	85	Switzerland	Germany	95	50	213	0.050%	0.055%	0.030%	0.045%
	86	South Africa	South Africa	49	42	446	0.026%	0.046%	0.062%	0.044%
59	87	Finland	Sweden	86	65	124	0.045%	0.071%	0.017%	0.044%
60	88	Singapore	China	63	32	452	0.033%	0.035%	0.063%	0.044%
61	89	Malaysia	United States of America	95	59	107	0.050%	0.064%	0.015%	0.043%
62	90	France	Germany	98	49	168	0.051%	0.053%	0.023%	0.043%
63	91	United States of America	Spain	76	44	284	0.040%	0.048%	0.039%	0.042%
	92	Poland	Poland	72	70	97	0.038%	0.075%	0.014%	0.042%
64	93	Finland	United States of America	92	35	288	0.048%	0.038%	0.040%	0.042%
65	94	France	United Kingdom	75	40	305	0.039%	0.043%	0.042%	0.042%
66	95	India	United States of America	81	51	185	0.043%	0.056%	0.026%	0.041%
67	96	Switzerland	France	63	40	332	0.033%	0.044%	0.046%	0.041%
68	97	Hong Kong	Singapore	45	33	394	0.024%	0.035%	0.055%	0.038%
69	98	France	Switzerland	65	40	258	0.034%	0.043%	0.036%	0.038%
70	99	Australia	United Kingdom	37	26	469	0.019%	0.028%	0.065%	0.038%
71	100	Netherlands	Germany	74	53	109	0.039%	0.058%	0.015%	0.037%

Appendix 8: Country pairs (overall investment) 101-200

		Investment country pairs: cross-border and domestic for all investments (1980-2005)								2/3
CB	Nr.	Source	Host	Participation	Deal part.	Deal flow	% Part.	% DP	%DF	Activity
72	101	Sweden	Denmark	70	44	188	0.037%	0.048%	0.026%	0.037%
73	102	Denmark	United States of America	82	33	229	0.043%	0.036%	0.032%	0.037%
74	103	United States of America	Mexico	45	40	311	0.024%	0.043%	0.043%	0.037%
75	104	Hong Kong	Australia	45	35	332	0.024%	0.038%	0.046%	0.036%
76	105	Ireland-Rep	United Kingdom	74	49	97	0.039%	0.053%	0.013%	0.035%
77	106	Netherlands	Belgium	61	35	246	0.032%	0.038%	0.034%	0.035%
78	107	Germany	United Kingdom	84	30	177	0.044%	0.032%	0.025%	0.034%
79	108	Italy	United States of America	83	33	148	0.044%	0.036%	0.021%	0.033%
80	109	United States of America	Malaysia	49	46	176	0.026%	0.050%	0.024%	0.033%
81	110	Hong Kong	Taiwan	38	34	300	0.020%	0.037%	0.042%	0.033%
82	111	South Korea	United States of America	75	33	147	0.039%	0.036%	0.020%	0.032%
83	112	United Kingdom	India	36	31	303	0.019%	0.034%	0.042%	0.032%
84	113	United States of America	Philippines	37	32	283	0.019%	0.035%	0.039%	0.031%
85	114	United States of America	Finland	59	32	204	0.031%	0.034%	0.028%	0.031%
86	115	Hong Kong	India	34	26	322	0.018%	0.029%	0.045%	0.030%
87	116	Germany	Israel	61	34	154	0.032%	0.037%	0.021%	0.030%
	117	Portugal	Portugal	55	49	54	0.029%	0.053%	0.008%	0.030%
88	118	United Kingdom	Canada	50	28	230	0.026%	0.030%	0.032%	0.029%
89	119	United States of America	Czech Republic	42	34	213	0.022%	0.036%	0.030%	0.029%
90	120	Norway	United States of America	70	31	112	0.037%	0.034%	0.016%	0.029%
91	121	Germany	France	50	16	292	0.026%	0.018%	0.041%	0.028%
92	122	United Kingdom	Israel	57	27	170	0.030%	0.030%	0.024%	0.028%
93	123	Germany	Switzerland	64	33	97	0.034%	0.036%	0.014%	0.028%
94	124	United States of America	Thailand	35	34	195	0.018%	0.036%	0.027%	0.027%
95	125	Netherlands	Denmark	15	9	437	0.008%	0.010%	0.061%	0.026%
96	126	United States of America	Poland	36	30	185	0.019%	0.033%	0.026%	0.026%
97	127	Hong Kong	Japan	15	12	406	0.008%	0.013%	0.056%	0.026%
98	128	Hong Kong	Indonesia	28	23	261	0.015%	0.025%	0.036%	0.025%
99	129	China	United States of America	58	25	126	0.030%	0.027%	0.018%	0.025%
100	130	Sweden	France	22	11	366	0.012%	0.012%	0.051%	0.025%
101	131	United Kingdom	Singapore	33	25	214	0.017%	0.027%	0.030%	0.025%
102	132	Belgium	United Kingdom	57	23	131	0.030%	0.025%	0.018%	0.024%
103	133	United States of America	Hungary	31	21	238	0.016%	0.023%	0.033%	0.024%
104	134	Singapore	Australia	22	18	270	0.012%	0.020%	0.038%	0.023%
105	135	Luxembourg	France	27	20	226	0.014%	0.022%	0.031%	0.023%
106	136	United States of America	Norway	31	21	196	0.016%	0.023%	0.027%	0.022%
107	137	United States of America	Austria	43	24	125	0.023%	0.026%	0.017%	0.022%
108	138	France	Belgium	40	17	190	0.021%	0.018%	0.026%	0.022%
109	139	United States of America	Indonesia	34	31	100	0.018%	0.034%	0.014%	0.022%
110	140	Norway	Sweden	45	32	30	0.024%	0.035%	0.004%	0.021%
111	141	Singapore	Hong Kong	27	18	196	0.014%	0.020%	0.027%	0.020%
	142	Malaysia	Malaysia	38	33	29	0.020%	0.036%	0.004%	0.020%
	143	Thailand	Thailand	32	32	60	0.017%	0.034%	0.008%	0.020%
112	144	United Kingdom	Bermuda	9	2	379	0.005%	0.002%	0.053%	0.020%
113	145	Sweden	Norway	24	18	194	0.013%	0.019%	0.027%	0.020%
114	146	Switzerland	Italy	28	23	134	0.015%	0.025%	0.019%	0.019%
115	147	Switzerland	United Kingdom	40	23	86	0.021%	0.024%	0.012%	0.019%
116	148	Ireland-Rep	United States of America	39	19	98	0.020%	0.021%	0.014%	0.018%
117	149	Denmark	United Kingdom	34	27	56	0.018%	0.029%	0.008%	0.018%
118	150	Mauritius	India	27	23	113	0.014%	0.025%	0.016%	0.018%
119	151	United States of America	New Zealand	23	19	159	0.012%	0.020%	0.022%	0.018%
120	152	Luxembourg	United States of America	67	14	23	0.035%	0.016%	0.003%	0.018%
121	153	Finland	Denmark	27	22	119	0.014%	0.023%	0.016%	0.018%
122	154	United Kingdom	Japan	20	17	177	0.011%	0.019%	0.025%	0.018%
123	155	Russian Federation	United States of America	37	24	56	0.019%	0.026%	0.008%	0.018%
	156	Hungary	Hungary	33	30	9	0.017%	0.033%	0.001%	0.017%
124	157	South Korea	China	3	1	340	0.002%	0.001%	0.047%	0.017%
125	158	United Kingdom	Austria	32	21	74	0.017%	0.023%	0.010%	0.017%
126	159	United States of America	Chile	20	16	157	0.011%	0.017%	0.022%	0.016%
	160	Czech Republic	Czech Republic	28	27	34	0.015%	0.029%	0.005%	0.016%
127	161	Germany	Austria	31	17	84	0.016%	0.019%	0.012%	0.016%
128	162	United States of America	Zambia	1	1	325	0.001%	0.001%	0.045%	0.016%
129	163	United States of America	Romania	17	15	153	0.009%	0.016%	0.021%	0.015%
130	164	United Kingdom	China	19	11	168	0.010%	0.012%	0.023%	0.015%
131	165	Australia	Singapore	24	23	55	0.013%	0.025%	0.008%	0.015%
132	166	New Zealand	United States of America	33	23	16	0.017%	0.025%	0.002%	0.015%
	167	Indonesia	Indonesia	13	5	227	0.007%	0.006%	0.031%	0.015%
133	168	Sweden	Germany	21	14	131	0.011%	0.015%	0.018%	0.015%
134	169	France	Sweden	29	17	73	0.015%	0.018%	0.010%	0.014%
135	170	United Kingdom	Australia	25	13	112	0.013%	0.014%	0.016%	0.014%
	171	Russian Federation	Russian Federation	22	21	65	0.012%	0.022%	0.009%	0.014%
136	172	Denmark	Sweden	31	19	38	0.016%	0.021%	0.005%	0.014%
137	173	Sweden	Switzerland	13	8	188	0.007%	0.009%	0.026%	0.014%
138	174	Netherlands	Switzerland	22	10	140	0.012%	0.011%	0.019%	0.014%
139	175	Czech Republic	Poland	25	25	12	0.013%	0.027%	0.002%	0.014%
140	176	France	Netherlands	16	9	153	0.008%	0.010%	0.021%	0.013%
141	177	Belgium	Netherlands	32	14	50	0.017%	0.016%	0.007%	0.013%
142	178	Taiwan	China	17	10	140	0.009%	0.010%	0.019%	0.013%
143	179	United States of America	Cayman Islands	3	3	241	0.002%	0.003%	0.034%	0.013%
144	180	Norway	Denmark	23	14	77	0.012%	0.015%	0.011%	0.013%
145	181	Germany	Sweden	16	10	129	0.008%	0.011%	0.018%	0.012%
146	182	Austria	Germany	24	19	26	0.013%	0.021%	0.004%	0.012%
147	183	United Kingdom	South Korea	10	3	204	0.005%	0.003%	0.028%	0.012%
148	184	Japan	United Kingdom	24	10	90	0.013%	0.011%	0.013%	0.012%
149	185	New Zealand	Australia	15	14	86	0.008%	0.016%	0.012%	0.012%
150	186	Brazil	United States of America	27	9	79	0.014%	0.010%	0.011%	0.012%
151	187	Netherlands	Sweden	23	13	60	0.012%	0.014%	0.008%	0.012%
152	188	United Kingdom	Norway	17	13	83	0.009%	0.014%	0.012%	0.011%
153	189	Israel	France	29	11	50	0.015%	0.011%	0.007%	0.011%
154	190	Italy	United Kingdom	28	10	57	0.015%	0.011%	0.008%	0.011%
155	191	Mauritius	United States of America	24	13	49	0.013%	0.014%	0.007%	0.011%
	192	Vietnam	Vietnam	19	19	19	0.010%	0.021%	0.003%	0.011%
156	193	Germany	Netherlands	24	13	42	0.013%	0.014%	0.006%	0.011%
157	194	United States of America	Portugal	16	10	102	0.008%	0.010%	0.014%	0.011%
158	195	Canada	Germany	5	2	197	0.003%	0.002%	0.027%	0.011%
159	196	United Kingdom	Hong Kong	15	11	86	0.008%	0.012%	0.012%	0.011%
160	197	Sweden	United Kingdom	20	13	52	0.011%	0.014%	0.007%	0.011%
161	198	Hong Kong	Thailand	14	14	63	0.007%	0.015%	0.009%	0.010%
162	199	Italy	Israel	21	17	13	0.011%	0.018%	0.002%	0.010%
163	200	Belgium	Germany	22	9	66	0.012%	0.010%	0.009%	0.010%

Appendix 9: Country pairs (overall investment) 201-300

Investment country pairs: cross-border and domestic for all investments (1980-2005) 3/3

CB	Nr.	Source	Host	Participation	Deal part.	Deal flow	% Part.	% DP	%DF	Activity
164	201	France	Spain	19	13	42	0.010%	0.014%	0.006%	0.010%
165	202	Hong Kong	Philippines	11	9	103	0.006%	0.009%	0.014%	0.010%
166	203	Hong Kong	Malaysia	17	13	42	0.009%	0.014%	0.006%	0.010%
167	204	Denmark	Germany	20	14	21	0.011%	0.015%	0.003%	0.010%
168	205	United States of America	Russian Federation	14	12	63	0.007%	0.012%	0.009%	0.010%
169	206	Japan	South Korea	14	11	66	0.007%	0.011%	0.009%	0.009%
170	207	Japan	Hong Kong	10	6	108	0.005%	0.006%	0.015%	0.009%
171	208	Norway	United Kingdom	19	12	25	0.010%	0.013%	0.003%	0.009%
172	209	Israel	Japan	3	1	170	0.002%	0.001%	0.024%	0.009%
	210	Greece	Greece	6	6	120	0.003%	0.006%	0.017%	0.009%
173	211	South Africa	United States of America	15	11	40	0.008%	0.012%	0.006%	0.008%
174	212	Poland	Czech Republic	15	13	27	0.008%	0.014%	0.004%	0.008%
175	213	France	Italy	13	11	48	0.007%	0.012%	0.007%	0.008%
176	214	Luxembourg	Germany	10	9	73	0.005%	0.010%	0.010%	0.008%
177	215	Canada	United Kingdom	20	6	55	0.011%	0.006%	0.008%	0.008%
178	216	United Kingdom	Nigeria	6	5	114	0.003%	0.005%	0.016%	0.008%
179	217	Spain	United States of America	4	2	138	0.002%	0.002%	0.019%	0.008%
180	218	Singapore	United Kingdom	18	7	46	0.009%	0.008%	0.006%	0.008%
181	219	Canada	France	17	8	38	0.009%	0.009%	0.005%	0.008%
182	220	Switzerland	Sweden	15	12	14	0.008%	0.013%	0.002%	0.008%
183	221	Germany	Canada	16	10	31	0.008%	0.010%	0.004%	0.008%
184	222	Israel	United Kingdom	18	8	37	0.009%	0.008%	0.005%	0.008%
185	223	France	Canada	20	9	18	0.011%	0.010%	0.003%	0.008%
186	224	Indonesia	United States of America	15	12	10	0.008%	0.013%	0.001%	0.007%
187	225	United States of America	South Africa	16	5	58	0.008%	0.006%	0.008%	0.007%
188	226	Sweden	Netherlands	8	6	79	0.004%	0.007%	0.011%	0.007%
189	227	Singapore	Indonesia	4	3	115	0.002%	0.004%	0.016%	0.007%
190	228	Czech Republic	Hungary	13	11	11	0.007%	0.012%	0.001%	0.007%
191	229	United Kingdom	Hungary	13	9	23	0.007%	0.010%	0.003%	0.007%
192	230	Switzerland	Denmark	12	5	59	0.006%	0.005%	0.008%	0.007%
193	231	Hong Kong	United Kingdom	10	7	53	0.005%	0.007%	0.007%	0.007%
194	232	Finland	South Korea	1	1	130	0.001%	0.001%	0.018%	0.007%
195	233	India	South Korea	2	1	117	0.001%	0.001%	0.016%	0.006%
196	234	Singapore	South Korea	10	7	39	0.005%	0.008%	0.005%	0.006%
197	235	Singapore	France	16	5	32	0.008%	0.006%	0.004%	0.006%
	236	Ukraine	Ukraine	11	11	5	0.006%	0.012%	0.001%	0.006%
198	237	Switzerland	Canada	12	7	28	0.006%	0.008%	0.004%	0.006%
199	238	United Kingdom	Portugal	2	1	114	0.001%	0.001%	0.016%	0.006%
200	239	United Kingdom	Sri Lanka	9	9	21	0.005%	0.010%	0.003%	0.006%
201	240	Japan	China	13	4	41	0.007%	0.005%	0.006%	0.006%
202	241	Australia	Hong Kong	10	9	18	0.005%	0.009%	0.003%	0.006%
203	242	France	Israel	14	7	18	0.007%	0.007%	0.002%	0.006%
204	243	Singapore	Taiwan	10	7	30	0.005%	0.008%	0.004%	0.006%
205	244	Switzerland	Israel	12	8	14	0.006%	0.009%	0.002%	0.006%
206	245	Belgium	Switzerland	14	7	19	0.007%	0.007%	0.003%	0.006%
207	246	United Kingdom	Taiwan	5	4	74	0.003%	0.004%	0.010%	0.006%
208	247	Italy	France	13	8	8	0.007%	0.009%	0.001%	0.006%
209	248	Singapore	Malaysia	10	8	19	0.005%	0.009%	0.003%	0.006%
210	249	Spain	United Kingdom	7	5	54	0.004%	0.005%	0.008%	0.006%
211	250	Switzerland	Austria	8	7	37	0.004%	0.007%	0.005%	0.006%
212	251	Netherlands	Italy	6	4	60	0.003%	0.005%	0.008%	0.005%
213	252	United Kingdom	Tanzania	2	2	94	0.001%	0.002%	0.013%	0.005%
214	253	France	Luxembourg	5	3	72	0.003%	0.004%	0.010%	0.005%
215	254	China	Hong Kong	7	4	54	0.004%	0.005%	0.008%	0.005%
216	255	Sweden	Belgium	2	2	91	0.001%	0.002%	0.013%	0.005%
217	256	United States of America	Greece	11	9	2	0.006%	0.009%	0.000%	0.005%
218	257	Brazil	Argentina	10	8	7	0.005%	0.009%	0.001%	0.005%
219	258	Denmark	Finland	12	7	14	0.006%	0.007%	0.002%	0.005%
220	259	United Kingdom	Czech Republic	8	5	38	0.004%	0.006%	0.005%	0.005%
	260	Iceland	Iceland	8	8	16	0.004%	0.009%	0.002%	0.005%
221	261	Singapore	Denmark	12	4	34	0.006%	0.004%	0.005%	0.005%
222	262	United Kingdom	South Africa	9	6	28	0.005%	0.006%	0.004%	0.005%
223	263	United Kingdom	Poland	8	4	45	0.004%	0.005%	0.006%	0.005%
224	264	United States of America	Bulgaria	6	3	59	0.003%	0.003%	0.008%	0.005%
225	265	Netherlands	Israel	12	5	15	0.006%	0.006%	0.002%	0.005%
226	266	Philippines	United States of America	13	4	25	0.007%	0.004%	0.003%	0.005%
227	267	Finland	Norway	9	6	21	0.005%	0.006%	0.003%	0.005%
228	268	Germany	Italy	8	7	18	0.004%	0.007%	0.002%	0.005%
229	269	United Kingdom	Luxembourg	3	2	75	0.002%	0.002%	0.010%	0.005%
230	270	Netherlands	Ireland-Rep	10	5	22	0.005%	0.005%	0.003%	0.005%
231	271	United Kingdom	Ghana	8	8	4	0.004%	0.009%	0.001%	0.004%
232	272	Netherlands	Spain	10	7	6	0.005%	0.007%	0.001%	0.004%
233	273	Singapore	Thailand	7	6	23	0.004%	0.007%	0.003%	0.004%
234	274	Luxembourg	Sweden	3	3	61	0.002%	0.003%	0.009%	0.004%
235	275	Japan	Israel	10	4	27	0.005%	0.004%	0.004%	0.004%
236	276	Luxembourg	Finland	4	4	49	0.002%	0.004%	0.007%	0.004%
237	277	Luxembourg	United Kingdom	8	6	17	0.004%	0.007%	0.002%	0.004%
238	278	Czech Republic	Slovak Republic	8	7	9	0.004%	0.008%	0.001%	0.004%
239	279	Singapore	Ireland-Rep	10	3	28	0.005%	0.004%	0.004%	0.004%
240	280	Japan	Singapore	10	4	21	0.005%	0.005%	0.003%	0.004%
241	281	United Kingdom	Kenya	7	6	17	0.004%	0.007%	0.002%	0.004%
242	282	United States of America	Nigeria	3	2	65	0.002%	0.002%	0.009%	0.004%
243	283	Singapore	Bermuda	1	0	86	0.001%	0.000%	0.012%	0.004%
244	284	Sweden	Bermuda	1	0	86	0.001%	0.000%	0.012%	0.004%
245	285	Czech Republic	United States of America	9	5	19	0.005%	0.005%	0.003%	0.004%
246	286	France	Denmark	10	5	16	0.005%	0.005%	0.002%	0.004%
247	287	Taiwan	South Korea	5	5	31	0.003%	0.005%	0.004%	0.004%
248	288	Bermuda	United States of America	8	3	32	0.004%	0.004%	0.004%	0.004%
249	289	Belgium	Spain	10	5	12	0.005%	0.005%	0.002%	0.004%
250	290	Greece	Romania	7	7	6	0.004%	0.008%	0.001%	0.004%
251	291	Italy	Spain	5	2	51	0.003%	0.002%	0.007%	0.004%
252	292	United States of America	Estonia	3	3	50	0.002%	0.003%	0.007%	0.004%
253	293	Romania	Spain	6	6	15	0.003%	0.007%	0.002%	0.004%
	294	Philippines	Philippines	8	7	0	0.004%	0.007%	0.000%	0.004%
254	295	United Kingdom	Argentina	3	3	46	0.002%	0.003%	0.006%	0.004%
255	296	Germany	Denmark	9	3	20	0.005%	0.004%	0.003%	0.004%
256	297	Taiwan	Israel	9	4	13	0.005%	0.005%	0.002%	0.004%
257	298	Canada	China	7	5	10	0.004%	0.006%	0.001%	0.004%
258	299	Belgium	Israel	7	5	11	0.004%	0.005%	0.002%	0.004%
259	300	Netherlands Antilles	France	6	6	6	0.003%	0.007%	0.001%	0.004%

Appendix 10: Country pairs (venture capital) 1-100

										1/3
Investment country pairs: Venture capital cross-border and domestic (1980-2005)

CB	Nr.	Source	Host	Participation	Deal part.	Deal flow	% Part.	% DP	%DF	Activity
	1	United States of America	United States of America	107,968	47,538	328,655	56.730%	51.562%	45.650%	51.314%
	2	United Kingdom	United Kingdom	4,066	3,015	24,687	2.137%	3.270%	3.429%	2.945%
	3	France	France	2,679	1,627	5,989	1.407%	1.765%	0.832%	1.335%
1	4	United Kingdom	United States of America	2,189	887	11,663	1.150%	0.962%	1.620%	1.244%
2	5	United States of America	United Kingdom	1,030	638	10,115	0.541%	0.692%	1.405%	0.879%
	6	Australia	Australia	1,137	952	2,541	0.597%	1.032%	0.353%	0.661%
	7	South Korea	South Korea	1,164	938	1,325	0.612%	1.017%	0.184%	0.604%
	8	Germany	Germany	1,245	824	1,748	0.654%	0.894%	0.243%	0.597%
	9	Canada	Canada	1,271	643	2,629	0.668%	0.697%	0.365%	0.577%
3	10	Canada	United States of America	974	306	3,475	0.512%	0.332%	0.483%	0.442%
	11	India	India	751	695	1,184	0.395%	0.753%	0.164%	0.437%
4	12	United States of America	Canada	691	348	3,474	0.363%	0.377%	0.483%	0.408%
	13	Sweden	Sweden	665	458	2,053	0.349%	0.497%	0.285%	0.377%
5	14	United Kingdom	Germany	448	332	3,594	0.236%	0.360%	0.499%	0.365%
6	15	Germany	United States of America	787	296	2,108	0.414%	0.321%	0.293%	0.343%
7	16	United Kingdom	France	447	306	3,292	0.235%	0.331%	0.457%	0.341%
8	17	United States of America	France	299	150	4,270	0.157%	0.163%	0.593%	0.304%
	18	Finland	Finland	525	449	428	0.276%	0.487%	0.059%	0.274%
9	19	United States of America	Germany	379	207	2,601	0.199%	0.224%	0.361%	0.262%
10	20	United States of America	Japan	236	193	2,978	0.124%	0.209%	0.414%	0.249%
11	21	Israel	United States of America	561	226	1,312	0.295%	0.245%	0.182%	0.241%
	22	Israel	Israel	482	237	1,055	0.253%	0.258%	0.146%	0.219%
	23	Denmark	Denmark	439	295	501	0.230%	0.320%	0.070%	0.207%
	24	Netherlands	Netherlands	411	313	455	0.216%	0.340%	0.063%	0.206%
12	25	France	United States of America	489	156	1,195	0.257%	0.170%	0.166%	0.197%
13	26	Japan	United States of America	445	136	1,275	0.234%	0.148%	0.177%	0.186%
	27	Japan	Japan	126	96	2,473	0.066%	0.105%	0.344%	0.171%
14	28	United States of America	Bermuda	70	33	3,170	0.037%	0.036%	0.440%	0.171%
15	29	United Kingdom	Netherlands	109	77	2,399	0.057%	0.083%	0.333%	0.158%
16	30	United States of America	China	208	116	1,507	0.109%	0.126%	0.209%	0.148%
17	31	Singapore	United States of America	339	100	1,075	0.178%	0.109%	0.149%	0.145%
18	32	United States of America	Israel	298	155	743	0.156%	0.168%	0.103%	0.143%
19	33	United States of America	Netherlands	190	96	1,561	0.100%	0.105%	0.217%	0.140%
20	34	United States of America	Ireland-Rep	125	73	1,922	0.066%	0.079%	0.267%	0.137%
21	35	United States of America	India	133	111	1,570	0.070%	0.121%	0.218%	0.136%
22	36	Taiwan	United States of America	303	108	867	0.159%	0.117%	0.120%	0.132%
23	37	Switzerland	United States of America	293	112	785	0.154%	0.122%	0.109%	0.128%
24	38	Netherlands	United States of America	177	65	1,451	0.093%	0.071%	0.202%	0.122%
	39	Italy	Italy	148	120	1,054	0.078%	0.130%	0.146%	0.118%
25	40	United Kingdom	Sweden	169	125	854	0.089%	0.136%	0.119%	0.114%
26	41	Australia	United States of America	247	148	331	0.130%	0.160%	0.046%	0.112%
	42	Spain	Spain	169	132	684	0.089%	0.144%	0.095%	0.109%
27	43	United States of America	Luxembourg	18	13	2,073	0.009%	0.014%	0.288%	0.104%
	44	Ireland-Rep	Ireland-Rep	210	148	250	0.110%	0.160%	0.035%	0.102%
28	45	Hong Kong	South Korea	35	25	1,741	0.018%	0.027%	0.242%	0.096%
	46	Switzerland	Switzerland	203	125	294	0.107%	0.136%	0.041%	0.094%
29	47	United States of America	South Korea	99	69	1,116	0.052%	0.075%	0.155%	0.094%
30	48	United States of America	Australia	158	127	422	0.083%	0.138%	0.059%	0.093%
31	49	United States of America	Hong Kong	133	90	782	0.070%	0.098%	0.109%	0.092%
32	50	United States of America	Switzerland	136	69	900	0.071%	0.075%	0.125%	0.091%
	51	Norway	Norway	158	129	344	0.083%	0.140%	0.048%	0.090%
	52	Belgium	Belgium	174	129	116	0.091%	0.140%	0.016%	0.082%
	53	Brazil	Brazil	132	123	296	0.069%	0.133%	0.041%	0.081%
33	54	Netherlands	United Kingdom	132	91	534	0.069%	0.099%	0.074%	0.081%
	55	Hong Kong	Hong Kong	100	79	720	0.053%	0.086%	0.100%	0.080%
34	56	United Kingdom	Spain	77	58	972	0.040%	0.063%	0.135%	0.079%
35	57	United States of America	Denmark	51	28	1,226	0.027%	0.030%	0.170%	0.076%
36	58	United States of America	Sweden	130	77	532	0.068%	0.084%	0.074%	0.075%
	59	Singapore	Singapore	123	91	415	0.064%	0.098%	0.058%	0.073%
37	60	United States of America	Brazil	87	54	724	0.045%	0.059%	0.101%	0.068%
38	61	United States of America	Singapore	102	82	426	0.053%	0.089%	0.059%	0.067%
39	62	United Kingdom	Finland	92	72	507	0.048%	0.078%	0.070%	0.066%
	63	Austria	Austria	133	100	128	0.070%	0.108%	0.018%	0.065%
40	64	United Kingdom	Ireland-Rep	87	54	639	0.046%	0.059%	0.089%	0.064%
41	65	United States of America	Argentina	53	26	960	0.028%	0.028%	0.133%	0.063%
	66	Taiwan	Taiwan	105	88	168	0.055%	0.096%	0.023%	0.058%
42	67	United States of America	Italy	47	32	808	0.025%	0.035%	0.112%	0.057%
43	68	Hong Kong	United States of America	105	41	485	0.055%	0.044%	0.067%	0.056%
44	69	United Kingdom	Switzerland	69	46	531	0.036%	0.050%	0.074%	0.053%
45	70	Sweden	United States of America	105	40	396	0.055%	0.043%	0.055%	0.051%
	71	China	China	99	71	170	0.052%	0.077%	0.024%	0.051%
46	72	United Kingdom	Belgium	38	26	742	0.020%	0.028%	0.103%	0.050%
47	73	Singapore	India	30	25	777	0.016%	0.027%	0.108%	0.050%
48	74	United States of America	Belgium	66	37	506	0.034%	0.040%	0.070%	0.048%
49	75	Hong Kong	China	49	26	636	0.026%	0.028%	0.088%	0.047%
50	76	Netherlands	France	52	27	584	0.027%	0.029%	0.081%	0.046%
51	77	United Kingdom	Italy	57	43	409	0.030%	0.046%	0.057%	0.044%
52	78	Malaysia	United States of America	95	59	107	0.050%	0.064%	0.015%	0.043%
53	79	Sweden	Finland	50	37	405	0.026%	0.041%	0.056%	0.041%
54	80	United States of America	Taiwan	66	53	212	0.034%	0.057%	0.029%	0.040%
55	81	Switzerland	Germany	86	45	193	0.045%	0.049%	0.027%	0.040%
56	82	United Kingdom	Denmark	45	36	413	0.024%	0.039%	0.057%	0.040%
57	83	France	Germany	86	44	153	0.045%	0.048%	0.021%	0.038%
	84	New Zealand	New Zealand	65	58	110	0.034%	0.063%	0.015%	0.037%
58	85	Singapore	China	54	24	414	0.028%	0.026%	0.058%	0.037%
59	86	Finland	United States of America	77	28	262	0.040%	0.031%	0.036%	0.036%
60	87	Australia	United Kingdom	33	23	466	0.017%	0.025%	0.065%	0.036%
61	88	Australia	New Zealand	32	28	411	0.017%	0.030%	0.057%	0.035%
62	89	France	Switzerland	58	35	255	0.030%	0.038%	0.035%	0.034%
63	90	Sweden	Denmark	65	41	174	0.034%	0.044%	0.024%	0.034%
64	91	France	United Kingdom	58	30	281	0.030%	0.033%	0.039%	0.034%
65	92	Italy	United States of America	83	33	148	0.044%	0.036%	0.021%	0.033%
66	93	Hong Kong	Australia	40	31	328	0.021%	0.033%	0.046%	0.033%
67	94	Netherlands	Belgium	52	31	234	0.027%	0.033%	0.033%	0.031%
68	95	United States of America	Malaysia	45	42	172	0.023%	0.045%	0.024%	0.031%
69	96	India	United States of America	54	40	141	0.028%	0.043%	0.020%	0.030%
70	97	United States of America	Mexico	35	30	256	0.018%	0.033%	0.036%	0.029%
71	98	Germany	United Kingdom	73	25	152	0.038%	0.027%	0.021%	0.029%
72	99	United States of America	Spain	46	29	198	0.024%	0.031%	0.027%	0.028%
73	100	Germany	Israel	54	30	144	0.028%	0.033%	0.020%	0.027%

Appendix 11: Country pairs (venture capital) 101-200

Investment country pairs: Venture capital cross-border and domestic (1980-2005)										2/3
CB	Nr.	Source	Host	Participation	Deal part.	Deal flow	% Part.	% DP	%DF	Activity
74	101	Netherlands	Germany	52	39	85	0.027%	0.042%	0.012%	0.027%
75	102	Hong Kong	Singapore	31	21	302	0.016%	0.022%	0.042%	0.027%
76	103	United States of America	Thailand	32	31	193	0.017%	0.033%	0.027%	0.026%
77	104	United Kingdom	India	29	25	247	0.015%	0.027%	0.034%	0.026%
78	105	Belgium	United States of America	64	27	94	0.034%	0.030%	0.013%	0.026%
79	106	Finland	Sweden	50	34	90	0.026%	0.037%	0.013%	0.025%
80	107	Germany	France	42	14	275	0.022%	0.015%	0.038%	0.025%
81	108	Netherlands	Denmark	13	7	431	0.007%	0.008%	0.060%	0.025%
82	109	Denmark	United States of America	58	20	162	0.030%	0.022%	0.022%	0.025%
83	110	Switzerland	France	32	19	264	0.017%	0.021%	0.037%	0.025%
84	111	China	United States of America	57	25	124	0.030%	0.027%	0.017%	0.025%
85	112	Sweden	France	21	10	366	0.011%	0.011%	0.051%	0.024%
86	113	Hong Kong	India	27	21	258	0.014%	0.023%	0.036%	0.024%
87	114	South Korea	United States of America	57	26	106	0.030%	0.028%	0.015%	0.024%
88	115	United States of America	Philippines	31	28	193	0.016%	0.030%	0.027%	0.024%
89	116	United Kingdom	Canada	42	22	188	0.022%	0.024%	0.026%	0.024%
	117	Poland	Poland	39	38	70	0.020%	0.041%	0.010%	0.024%
90	118	Belgium	France	38	18	224	0.020%	0.019%	0.031%	0.023%
91	119	United States of America	Czech Republic	33	25	188	0.017%	0.027%	0.026%	0.023%
92	120	Hong Kong	Japan	11	8	393	0.006%	0.009%	0.055%	0.023%
	121	Portugal	Portugal	41	36	44	0.022%	0.039%	0.006%	0.022%
93	122	Hong Kong	Taiwan	25	22	213	0.013%	0.024%	0.030%	0.022%
94	123	Germany	Switzerland	50	26	87	0.026%	0.028%	0.012%	0.022%
95	124	United Kingdom	Singapore	30	22	188	0.016%	0.024%	0.026%	0.022%
96	125	Norway	United States of America	53	23	89	0.028%	0.025%	0.012%	0.022%
97	126	Luxembourg	France	24	19	220	0.013%	0.021%	0.031%	0.021%
98	127	Ireland-Rep	United Kingdom	47	27	66	0.025%	0.030%	0.009%	0.021%
99	128	United Kingdom	Israel	43	18	146	0.023%	0.019%	0.020%	0.021%
100	129	United Kingdom	Bermuda	9	2	379	0.005%	0.002%	0.053%	0.020%
	130	South Africa	South Africa	33	29	73	0.017%	0.031%	0.010%	0.020%
101	131	Mauritius	India	27	23	113	0.014%	0.025%	0.016%	0.018%
102	132	United States of America	Indonesia	27	24	97	0.014%	0.026%	0.013%	0.018%
103	133	France	Belgium	32	12	169	0.017%	0.013%	0.023%	0.018%
104	134	Norway	Sweden	38	28	15	0.020%	0.031%	0.002%	0.018%
105	135	Russian Federation	United States of America	36	23	56	0.019%	0.025%	0.008%	0.017%
106	136	Switzerland	United Kingdom	35	21	69	0.018%	0.022%	0.010%	0.017%
107	137	United Kingdom	Japan	19	17	162	0.010%	0.018%	0.023%	0.017%
108	138	South Korea	China	3	1	340	0.002%	0.001%	0.047%	0.017%
109	139	Hong Kong	Indonesia	19	16	158	0.010%	0.017%	0.022%	0.016%
110	140	United States of America	Norway	19	14	158	0.010%	0.015%	0.022%	0.016%
111	141	United States of America	Zambia	1	1	325	0.001%	0.001%	0.045%	0.016%
112	142	Singapore	Australia	9	6	250	0.005%	0.007%	0.035%	0.015%
113	143	United States of America	Hungary	18	13	155	0.009%	0.014%	0.022%	0.015%
114	144	Switzerland	Italy	21	17	113	0.011%	0.018%	0.016%	0.015%
115	145	Sweden	Germany	21	14	131	0.011%	0.015%	0.018%	0.015%
	146	Hungary	Hungary	28	26	6	0.015%	0.028%	0.001%	0.015%
	147	Indonesia	Indonesia	12	4	227	0.006%	0.005%	0.031%	0.014%
116	148	New Zealand	United States of America	30	22	15	0.016%	0.024%	0.002%	0.014%
	149	Thailand	Thailand	25	25	11	0.013%	0.027%	0.002%	0.014%
117	150	Australia	Singapore	22	21	53	0.012%	0.023%	0.007%	0.014%
118	151	Singapore	Hong Kong	16	9	159	0.008%	0.010%	0.022%	0.014%
119	152	Sweden	Norway	15	10	162	0.008%	0.010%	0.022%	0.014%
120	153	Finland	Denmark	20	15	97	0.010%	0.016%	0.013%	0.013%
121	154	United States of America	Finland	27	15	61	0.014%	0.017%	0.008%	0.013%
122	155	Denmark	United Kingdom	25	19	34	0.013%	0.020%	0.005%	0.013%
	156	Russian Federation	Russian Federation	19	18	65	0.010%	0.019%	0.009%	0.013%
123	157	France	Sweden	24	15	67	0.013%	0.016%	0.009%	0.013%
124	158	Netherlands	Switzerland	18	9	136	0.009%	0.010%	0.019%	0.013%
125	159	United States of America	Poland	15	12	121	0.008%	0.013%	0.017%	0.013%
126	160	United Kingdom	Austria	25	17	41	0.013%	0.018%	0.006%	0.012%
127	161	Denmark	Sweden	26	16	35	0.014%	0.017%	0.005%	0.012%
128	162	Sweden	Switzerland	9	6	175	0.005%	0.006%	0.024%	0.012%
129	163	Mauritius	United States of America	24	13	49	0.013%	0.014%	0.007%	0.011%
130	164	Taiwan	China	14	7	128	0.007%	0.007%	0.018%	0.011%
131	165	Brazil	United States of America	25	8	75	0.013%	0.008%	0.010%	0.011%
132	166	Netherlands	Sweden	21	12	56	0.011%	0.013%	0.008%	0.011%
133	167	Italy	Israel	21	17	13	0.011%	0.018%	0.002%	0.010%
134	168	United Kingdom	Norway	15	11	78	0.008%	0.012%	0.011%	0.010%
135	169	Israel	France	28	10	36	0.015%	0.011%	0.005%	0.010%
	170	Malaysia	Malaysia	20	17	16	0.010%	0.018%	0.002%	0.010%
136	171	Canada	Germany	3	1	195	0.002%	0.001%	0.027%	0.010%
137	172	Germany	Netherlands	21	13	32	0.011%	0.014%	0.005%	0.010%
138	173	United States of America	Romania	12	10	89	0.006%	0.011%	0.012%	0.010%
139	174	Italy	United Kingdom	24	9	44	0.013%	0.010%	0.006%	0.010%
140	175	United States of America	Chile	12	10	84	0.006%	0.010%	0.012%	0.009%
141	176	Japan	United Kingdom	18	8	72	0.009%	0.009%	0.010%	0.009%
142	177	United Kingdom	China	13	7	100	0.007%	0.007%	0.014%	0.009%
143	178	Germany	Austria	19	10	52	0.010%	0.011%	0.007%	0.009%
144	179	France	Spain	18	12	42	0.009%	0.012%	0.006%	0.009%
145	180	Belgium	United Kingdom	21	8	57	0.011%	0.009%	0.008%	0.009%
146	181	United States of America	Portugal	12	8	85	0.006%	0.009%	0.012%	0.009%
147	182	Austria	Germany	17	14	19	0.009%	0.015%	0.003%	0.009%
148	183	United States of America	Austria	16	9	60	0.008%	0.010%	0.008%	0.009%
149	184	Israel	Japan	3	1	170	0.002%	0.001%	0.024%	0.009%
150	185	South Africa	United States of America	15	11	40	0.008%	0.012%	0.006%	0.008%
151	186	Poland	Czech Republic	15	13	27	0.008%	0.014%	0.004%	0.008%
152	187	Luxembourg	Germany	10	9	73	0.005%	0.010%	0.010%	0.008%
153	188	Spain	United States of America	4	2	138	0.002%	0.002%	0.019%	0.008%
154	189	Singapore	United Kingdom	18	7	46	0.009%	0.008%	0.006%	0.008%
155	190	Japan	Hong Kong	8	4	108	0.004%	0.004%	0.015%	0.008%
156	191	Canada	France	17	8	38	0.009%	0.009%	0.005%	0.008%
157	192	Germany	Canada	16	10	31	0.008%	0.010%	0.004%	0.008%
158	193	Ireland-Rep	United States of America	18	9	36	0.009%	0.009%	0.005%	0.008%
159	194	New Zealand	Australia	14	13	8	0.007%	0.014%	0.001%	0.008%
160	195	Norway	Denmark	17	10	21	0.009%	0.011%	0.003%	0.008%
161	196	Indonesia	United States of America	15	12	10	0.008%	0.013%	0.001%	0.007%
	197	Czech Republic	Czech Republic	13	13	8	0.007%	0.014%	0.001%	0.007%
162	198	Sweden	Netherlands	7	6	79	0.004%	0.006%	0.011%	0.007%
163	199	France	Italy	10	8	47	0.005%	0.009%	0.007%	0.007%
164	200	Belgium	Netherlands	15	8	25	0.008%	0.009%	0.003%	0.007%

Appendix 12: Country pairs (venture capital) 201-300

Investment country pairs: Venture capital cross-border and domestic (1980-2005)										3/3
CB	Nr.	Source	Host	Participation	Deal part.	Deal flow	% Part.	% DP	%DF	Activity
165	201	Czech Republic	Hungary	13	11	11	0.007%	0.012%	0.001%	0.007%
166	202	Norway	United Kingdom	15	9	18	0.008%	0.010%	0.002%	0.007%
167	203	France	Canada	18	8	17	0.009%	0.008%	0.002%	0.007%
168	204	Canada	United Kingdom	17	4	48	0.009%	0.005%	0.007%	0.007%
169	205	United States of America	New Zealand	11	10	23	0.006%	0.011%	0.003%	0.007%
170	206	Hong Kong	Philippines	6	5	80	0.003%	0.005%	0.011%	0.007%
171	207	Finland	South Korea	1	1	130	0.001%	0.001%	0.018%	0.007%
172	208	United Kingdom	Nigeria	5	4	89	0.003%	0.004%	0.012%	0.006%
173	209	United Kingdom	Hong Kong	9	7	51	0.004%	0.008%	0.007%	0.006%
174	210	India	South Korea	2	1	117	0.001%	0.001%	0.016%	0.006%
175	211	Singapore	France	16	5	32	0.008%	0.006%	0.004%	0.006%
	212	Ukraine	Ukraine	11	11	5	0.006%	0.012%	0.001%	0.006%
176	213	Singapore	Indonesia	3	2	101	0.002%	0.002%	0.014%	0.006%
177	214	Denmark	Germany	13	8	14	0.007%	0.009%	0.002%	0.006%
178	215	Japan	South Korea	8	7	42	0.004%	0.007%	0.006%	0.006%
179	216	United Kingdom	Hungary	10	8	22	0.005%	0.008%	0.003%	0.006%
180	217	France	Netherlands	11	7	27	0.006%	0.007%	0.004%	0.006%
181	218	United Kingdom	Tanzania	2	2	94	0.001%	0.002%	0.013%	0.005%
182	219	United States of America	Russian Federation	9	9	14	0.005%	0.009%	0.002%	0.005%
183	220	Hong Kong	Thailand	7	7	33	0.004%	0.008%	0.005%	0.005%
184	221	China	Hong Kong	7	4	54	0.004%	0.005%	0.008%	0.005%
185	222	Sweden	Belgium	2	2	91	0.001%	0.002%	0.013%	0.005%
186	223	Singapore	South Korea	8	6	36	0.004%	0.007%	0.005%	0.005%
187	224	Australia	Hong Kong	9	9	10	0.005%	0.009%	0.001%	0.005%
188	225	Israel	United Kingdom	12	5	27	0.006%	0.005%	0.004%	0.005%
	226	Iceland	Iceland	8	8	16	0.004%	0.009%	0.002%	0.005%
189	227	Singapore	Denmark	12	4	34	0.006%	0.004%	0.005%	0.005%
190	228	Switzerland	Sweden	10	7	13	0.005%	0.008%	0.002%	0.005%
191	229	Switzerland	Canada	10	5	28	0.005%	0.006%	0.004%	0.005%
192	230	Philippines	United States of America	13	4	25	0.007%	0.004%	0.003%	0.005%
193	231	United Kingdom	South Korea	5	2	70	0.003%	0.002%	0.010%	0.005%
194	232	France	Israel	11	5	15	0.006%	0.006%	0.002%	0.005%
195	233	United Kingdom	Ghana	8	8	4	0.004%	0.009%	0.001%	0.004%
196	234	Netherlands	Spain	10	7	6	0.005%	0.007%	0.001%	0.004%
197	235	Luxembourg	Finland	4	4	49	0.002%	0.004%	0.007%	0.004%
198	236	Singapore	Malaysia	8	6	15	0.004%	0.007%	0.002%	0.004%
199	237	Singapore	Ireland-Rep	10	3	28	0.005%	0.004%	0.004%	0.004%
200	238	Sweden	United Kingdom	10	4	22	0.005%	0.005%	0.003%	0.004%
201	239	Switzerland	Israel	9	6	14	0.005%	0.006%	0.002%	0.004%
202	240	Singapore	Bermuda	1	0	86	0.001%	0.000%	0.012%	0.004%
203	241	Sweden	Bermuda	1	0	86	0.001%	0.000%	0.012%	0.004%
204	242	Czech Republic	United States of America	9	5	19	0.005%	0.005%	0.003%	0.004%
205	243	Netherlands	Ireland-Rep	9	5	21	0.005%	0.005%	0.003%	0.004%
206	244	United Kingdom	Luxembourg	2	1	72	0.001%	0.001%	0.010%	0.004%
207	245	Japan	China	11	3	21	0.006%	0.004%	0.003%	0.004%
208	246	Taiwan	South Korea	5	5	31	0.003%	0.005%	0.004%	0.004%
209	247	United Kingdom	South Africa	6	5	28	0.003%	0.005%	0.004%	0.004%
210	248	Italy	Spain	5	2	51	0.003%	0.002%	0.007%	0.004%
211	249	Hong Kong	United Kingdom	6	3	39	0.003%	0.003%	0.005%	0.004%
212	250	Japan	Israel	9	4	23	0.005%	0.004%	0.003%	0.004%
213	251	Romania	Spain	6	6	15	0.003%	0.007%	0.002%	0.004%
214	252	Luxembourg	Sweden	2	2	61	0.001%	0.002%	0.009%	0.004%
215	253	France	Denmark	9	4	16	0.005%	0.005%	0.002%	0.004%
	254	Philippines	Philippines	8	7	0	0.004%	0.007%	0.000%	0.004%
216	255	Hong Kong	Malaysia	8	5	14	0.004%	0.005%	0.002%	0.004%
217	256	United Kingdom	Argentina	3	3	46	0.002%	0.003%	0.006%	0.004%
218	257	Belgium	Spain	9	5	10	0.005%	0.005%	0.001%	0.004%
219	258	Canada	China	7	5	10	0.004%	0.006%	0.001%	0.004%
220	259	Switzerland	Austria	7	6	6	0.004%	0.006%	0.001%	0.004%
221	260	Norway	Switzerland	6	3	26	0.003%	0.004%	0.004%	0.004%
222	261	Germany	China	7	4	15	0.004%	0.005%	0.002%	0.003%
223	262	Japan	Malaysia	2	2	51	0.001%	0.002%	0.007%	0.003%
224	263	Greece	Romania	6	6	3	0.003%	0.007%	0.000%	0.003%
225	264	United Kingdom	Australia	6	4	16	0.003%	0.005%	0.002%	0.003%
226	265	Hong Kong	Germany	2	1	60	0.001%	0.001%	0.008%	0.003%
227	266	Germany	Sweden	9	4	9	0.005%	0.004%	0.001%	0.003%
	267	Vietnam	Vietnam	6	6	2	0.003%	0.007%	0.000%	0.003%
228	268	Germany	Denmark	8	3	16	0.004%	0.003%	0.002%	0.003%
229	269	Taiwan	Israel	8	4	9	0.004%	0.004%	0.001%	0.003%
230	270	Netherlands	Israel	8	4	10	0.004%	0.004%	0.001%	0.003%
231	271	Sweden	Hong Kong	1	1	60	0.001%	0.001%	0.008%	0.003%
232	272	United Kingdom	Poland	5	3	23	0.003%	0.003%	0.003%	0.003%
233	273	Finland	Switzerland	7	4	9	0.004%	0.004%	0.001%	0.003%
234	274	Norway	Finland	1	1	55	0.001%	0.001%	0.008%	0.003%
235	275	Poland	Russian Federation	5	5	8	0.003%	0.005%	0.001%	0.003%
236	276	Luxembourg	Netherlands	2	1	48	0.001%	0.001%	0.007%	0.003%
237	277	Luxembourg	United Kingdom	5	5	7	0.003%	0.005%	0.001%	0.003%
238	278	Spain	United Kingdom	4	3	27	0.002%	0.003%	0.004%	0.003%
239	279	Italy	France	8	4	4	0.004%	0.004%	0.001%	0.003%
240	280	Singapore	Netherlands	7	3	11	0.004%	0.004%	0.001%	0.003%
241	281	United Kingdom	Czech Republic	5	4	15	0.003%	0.004%	0.002%	0.003%
242	282	United States of America	South Africa	8	2	16	0.004%	0.002%	0.002%	0.003%
243	283	Switzerland	Denmark	7	3	12	0.004%	0.003%	0.002%	0.003%
244	284	France	Austria	6	3	14	0.003%	0.004%	0.002%	0.003%
245	285	United States of America	Estonia	1	1	50	0.001%	0.001%	0.007%	0.003%
	286	Nigeria	Nigeria	5	5	3	0.003%	0.005%	0.000%	0.003%
246	287	Czech Republic	Slovak Republic	5	5	6	0.003%	0.005%	0.001%	0.003%
247	288	Austria	Hungary	5	4	8	0.003%	0.005%	0.001%	0.003%
248	289	Denmark	France	5	3	17	0.003%	0.003%	0.002%	0.003%
249	290	Czech Republic	Bulgaria	1	0	55	0.001%	0.000%	0.008%	0.003%
250	291	Singapore	Thailand	4	3	20	0.002%	0.003%	0.003%	0.003%
251	292	United Kingdom	Romania	4	2	29	0.002%	0.002%	0.004%	0.003%
252	293	Poland	Romania	4	2	24	0.002%	0.003%	0.003%	0.003%
253	294	United Kingdom	Kenya	4	3	17	0.002%	0.003%	0.002%	0.003%
254	295	United States of America	Cyprus	1	1	45	0.001%	0.001%	0.006%	0.003%
255	296	Singapore	Canada	8	2	14	0.004%	0.002%	0.002%	0.003%
256	297	Finland	Netherlands	7	3	5	0.004%	0.003%	0.001%	0.003%
257	298	Portugal	United Kingdom	3	2	31	0.002%	0.002%	0.004%	0.003%
258	299	Cayman Islands	United States of America	7	2	16	0.004%	0.002%	0.002%	0.003%
259	300	Germany	Belgium	5	4	7	0.003%	0.004%	0.001%	0.003%

Appendix 13: Country pairs (private equity) 1-100

Investmer Investment country pairs: Private Equity cross-border and domestic (1980-2005)										1/3
CB	Nr.	Source	Host	Participation	Deal part.	Deal flow	% Part.	% DP	%DF	Activity
	1	United States of America	United States of America	36,134	16,038	160,835	18.986%	17.396%	22.340%	19.574%
	2	United Kingdom	United Kingdom	1,102	832	10,183	0.579%	0.903%	1.414%	0.965%
1	3	United States of America	United Kingdom	647	388	4,742	0.340%	0.421%	0.659%	0.473%
2	4	United Kingdom	United States of America	750	318	4,762	0.394%	0.345%	0.661%	0.467%
	5	France	France	787	478	2,274	0.414%	0.518%	0.316%	0.416%
3	6	United States of America	France	389	205	2,488	0.204%	0.222%	0.346%	0.257%
	7	Australia	Australia	410	343	868	0.215%	0.372%	0.121%	0.236%
4	8	United States of America	Germany	208	123	2,300	0.109%	0.134%	0.320%	0.188%
5	9	United States of America	Canada	258	141	1,628	0.136%	0.153%	0.226%	0.172%
	10	Germany	Germany	225	156	800	0.118%	0.169%	0.111%	0.133%
6	11	United States of America	Bermuda	35	11	2,627	0.018%	0.012%	0.365%	0.132%
7	12	United Kingdom	France	134	101	1,464	0.070%	0.110%	0.203%	0.128%
	13	Brazil	Brazil	117	110	1,418	0.061%	0.119%	0.197%	0.126%
8	14	United Kingdom	Germany	104	82	1,662	0.054%	0.089%	0.231%	0.125%
9	15	United States of America	Netherlands	133	68	1,402	0.070%	0.073%	0.195%	0.113%
10	16	Canada	United States of America	149	49	1,317	0.078%	0.053%	0.183%	0.105%
11	17	United States of America	South Korea	53	36	1,742	0.028%	0.039%	0.242%	0.103%
	18	Sweden	Sweden	177	148	326	0.093%	0.161%	0.045%	0.100%
12	19	United States of America	Japan	53	34	1,490	0.028%	0.036%	0.207%	0.090%
	20	South Korea	South Korea	189	134	163	0.099%	0.145%	0.023%	0.089%
13	21	United States of America	Singapore	32	22	1,348	0.017%	0.024%	0.187%	0.076%
	22	Belgium	Belgium	152	103	238	0.080%	0.112%	0.033%	0.075%
14	23	United States of America	China	98	53	810	0.051%	0.057%	0.112%	0.074%
15	24	Taiwan	United States of America	141	78	394	0.074%	0.084%	0.055%	0.071%
	25	Canada	Canada	163	77	295	0.085%	0.084%	0.041%	0.070%
16	26	Japan	United States of America	142	43	570	0.075%	0.046%	0.079%	0.067%
17	27	Germany	United States of America	123	45	603	0.065%	0.049%	0.084%	0.066%
18	28	United States of America	Israel	124	70	389	0.065%	0.076%	0.054%	0.065%
	29	Finland	Finland	114	95	228	0.060%	0.103%	0.032%	0.065%
	30	India	India	103	96	200	0.054%	0.104%	0.028%	0.062%
19	31	Israel	United States of America	148	54	300	0.078%	0.059%	0.042%	0.060%
20	32	United States of America	Australia	84	50	574	0.044%	0.054%	0.080%	0.059%
21	33	United Kingdom	Netherlands	23	15	962	0.012%	0.017%	0.134%	0.054%
	34	Ireland-Rep	Ireland-Rep	104	78	130	0.055%	0.085%	0.018%	0.053%
22	35	United States of America	India	69	52	464	0.036%	0.057%	0.064%	0.052%
23	36	Netherlands	United States of America	74	34	499	0.039%	0.037%	0.069%	0.048%
24	37	United States of America	Italy	49	30	610	0.026%	0.033%	0.085%	0.048%
25	38	Belgium	United States of America	109	45	240	0.057%	0.049%	0.033%	0.046%
	39	Israel	Israel	104	45	233	0.055%	0.049%	0.032%	0.045%
26	40	United States of America	Hong Kong	52	31	514	0.027%	0.034%	0.071%	0.044%
	41	Spain	Spain	49	38	441	0.025%	0.041%	0.061%	0.043%
27	42	United States of America	Belgium	49	26	510	0.025%	0.029%	0.071%	0.042%
28	43	United States of America	Ireland-Rep	27	13	699	0.014%	0.014%	0.097%	0.042%
29	44	United States of America	Switzerland	53	32	434	0.028%	0.035%	0.060%	0.041%
	45	Netherlands	Netherlands	61	40	339	0.032%	0.044%	0.047%	0.041%
30	46	United States of America	Sweden	51	25	430	0.027%	0.027%	0.060%	0.038%
31	47	United Kingdom	Italy	22	20	571	0.012%	0.022%	0.079%	0.037%
32	48	France	United States of America	87	34	194	0.046%	0.037%	0.027%	0.037%
33	49	United States of America	Luxembourg	11	5	709	0.006%	0.005%	0.099%	0.036%
	50	Taiwan	Taiwan	64	56	66	0.033%	0.061%	0.009%	0.035%
	51	Norway	Norway	61	47	104	0.032%	0.051%	0.014%	0.032%
	52	South Africa	South Africa	16	13	373	0.008%	0.015%	0.052%	0.025%
34	53	Australia	United States of America	51	35	48	0.027%	0.038%	0.007%	0.024%
	54	Hong Kong	Hong Kong	28	24	215	0.015%	0.026%	0.030%	0.023%
35	55	United States of America	Taiwan	32	27	173	0.017%	0.030%	0.024%	0.023%
36	56	Switzerland	United States of America	63	25	74	0.033%	0.027%	0.010%	0.023%
	57	Denmark	Denmark	42	34	41	0.022%	0.037%	0.006%	0.022%
37	58	Belgium	France	32	14	236	0.017%	0.015%	0.033%	0.022%
38	59	Netherlands	United Kingdom	25	15	253	0.013%	0.016%	0.035%	0.021%
39	60	United States of America	Denmark	24	12	252	0.013%	0.013%	0.035%	0.020%
40	61	Finland	Sweden	36	31	34	0.019%	0.034%	0.005%	0.019%
	62	Japan	Japan	22	16	194	0.012%	0.018%	0.027%	0.019%
	63	Poland	Poland	33	32	27	0.017%	0.035%	0.004%	0.019%
41	64	United Kingdom	Ireland-Rep	15	10	265	0.008%	0.010%	0.037%	0.018%
42	65	United States of America	Finland	32	16	144	0.017%	0.018%	0.020%	0.018%
43	66	United States of America	Brazil	31	17	140	0.016%	0.019%	0.019%	0.018%
	67	Italy	Italy	28	22	115	0.014%	0.023%	0.016%	0.018%
44	68	United Kingdom	Switzerland	24	19	134	0.013%	0.021%	0.019%	0.017%
45	69	Hong Kong	South Korea	9	5	294	0.005%	0.006%	0.041%	0.017%
46	70	Singapore	United States of America	32	18	109	0.017%	0.019%	0.015%	0.017%
47	71	Luxembourg	United States of America	64	13	21	0.034%	0.014%	0.003%	0.017%
48	72	Switzerland	France	31	21	67	0.016%	0.023%	0.009%	0.016%
49	73	Belgium	United Kingdom	36	15	75	0.019%	0.017%	0.010%	0.015%
50	74	United Kingdom	Spain	20	11	166	0.010%	0.012%	0.023%	0.015%
	75	Singapore	Singapore	12	11	186	0.006%	0.012%	0.026%	0.015%
51	76	United States of America	Spain	31	15	86	0.016%	0.016%	0.012%	0.015%
52	77	Ireland-Rep	United Kingdom	27	22	31	0.014%	0.024%	0.004%	0.014%
53	78	United Kingdom	Sweden	17	11	137	0.009%	0.012%	0.019%	0.014%
54	79	United States of America	Poland	22	18	64	0.011%	0.020%	0.009%	0.013%
55	80	United States of America	Austria	27	15	65	0.014%	0.016%	0.009%	0.013%
56	81	Czech Republic	Poland	24	24	12	0.012%	0.025%	0.002%	0.013%
57	82	Sweden	United States of America	29	11	89	0.015%	0.012%	0.012%	0.013%
58	83	Hong Kong	United States of America	18	11	126	0.009%	0.012%	0.018%	0.013%
	84	Austria	Austria	24	19	31	0.012%	0.020%	0.004%	0.012%
59	85	Denmark	United States of America	25	13	68	0.013%	0.014%	0.009%	0.012%
60	86	Australia	New Zealand	17	15	76	0.009%	0.016%	0.011%	0.012%
61	87	United States of America	Cayman Islands	1	1	240	0.001%	0.001%	0.033%	0.012%
	88	New Zealand	New Zealand	21	20	20	0.011%	0.021%	0.003%	0.012%
62	89	United States of America	New Zealand	12	9	137	0.006%	0.009%	0.019%	0.011%
63	90	India	United States of America	27	12	44	0.014%	0.013%	0.006%	0.011%
64	91	Hong Kong	Singapore	14	12	92	0.007%	0.013%	0.013%	0.011%
65	92	United Kingdom	Australia	19	9	96	0.010%	0.010%	0.013%	0.011%
66	93	Ireland-Rep	United States of America	21	12	62	0.011%	0.012%	0.009%	0.011%
	94	Switzerland	Switzerland	22	15	30	0.012%	0.016%	0.004%	0.010%
67	95	Hong Kong	Taiwan	13	12	87	0.007%	0.012%	0.012%	0.010%
68	96	Netherlands	Germany	22	15	25	0.012%	0.016%	0.003%	0.010%
	97	Malaysia	Malaysia	19	17	13	0.010%	0.018%	0.002%	0.010%
69	98	Hong Kong	China	13	10	86	0.007%	0.010%	0.012%	0.010%
70	99	United States of America	Argentina	15	8	90	0.008%	0.009%	0.013%	0.010%
71	100	Germany	Sweden	7	7	120	0.004%	0.007%	0.017%	0.009%

Appendix 14: Country pairs (private equity) 101-200

Investment country pairs: Private Equity cross-border and domestic (1980-2005)										2/3
CB	Nr.	Source	Host	Participation	Deal part.	Deal flow	% Part.	% DP	%DF	Activity
72	101	United States of America	Hungary	13	8	83	0.007%	0.009%	0.012%	0.009%
	102	Czech Republic	Czech Republic	15	14	26	0.008%	0.015%	0.004%	0.009%
73	103	Hong Kong	Indonesia	9	7	102	0.005%	0.008%	0.014%	0.009%
74	104	France	United Kingdom	18	10	25	0.009%	0.011%	0.003%	0.008%
	105	Vietnam	Vietnam	13	13	17	0.007%	0.014%	0.002%	0.008%
75	106	Belgium	Germany	16	6	64	0.008%	0.006%	0.009%	0.008%
76	107	South Korea	United States of America	18	7	41	0.009%	0.008%	0.006%	0.008%
77	108	United States of America	Mexico	11	9	55	0.006%	0.010%	0.008%	0.008%
78	109	France	Netherlands	5	3	126	0.003%	0.003%	0.018%	0.008%
79	110	United Kingdom	South Korea	5	1	134	0.003%	0.002%	0.019%	0.008%
	111	Portugal	Portugal	14	13	11	0.007%	0.014%	0.001%	0.008%
	112	Greece	Greece	4	4	116	0.002%	0.004%	0.016%	0.008%
80	113	Singapore	Australia	13	12	20	0.007%	0.013%	0.003%	0.007%
	114	China	China	14	13	3	0.007%	0.014%	0.000%	0.007%
81	115	Norway	United States of America	18	8	24	0.009%	0.009%	0.003%	0.007%
82	116	United Kingdom	Denmark	10	7	64	0.005%	0.007%	0.009%	0.007%
83	117	United States of America	Philippines	7	5	90	0.003%	0.005%	0.013%	0.007%
84	118	United Kingdom	Israel	14	10	24	0.007%	0.010%	0.003%	0.007%
85	119	United States of America	Chile	8	6	72	0.004%	0.007%	0.010%	0.007%
86	120	Singapore	Hong Kong	11	9	37	0.006%	0.010%	0.005%	0.007%
87	121	United States of America	Norway	12	7	38	0.006%	0.008%	0.005%	0.006%
88	122	Germany	Austria	12	8	32	0.006%	0.008%	0.004%	0.006%
89	123	Belgium	Netherlands	17	6	26	0.009%	0.006%	0.004%	0.006%
90	124	Sweden	United Kingdom	10	9	30	0.005%	0.009%	0.004%	0.006%
91	125	Singapore	China	9	8	37	0.005%	0.009%	0.005%	0.006%
92	126	Finland	United States of America	15	6	27	0.008%	0.007%	0.004%	0.006%
93	127	Hong Kong	India	7	5	64	0.004%	0.006%	0.009%	0.006%
94	128	United States of America	Czech Republic	10	9	25	0.005%	0.010%	0.003%	0.006%
95	129	United Kingdom	India	7	6	56	0.004%	0.007%	0.008%	0.006%
96	130	Hong Kong	Malaysia	9	9	28	0.005%	0.009%	0.004%	0.006%
97	131	Sweden	Norway	9	8	32	0.005%	0.009%	0.004%	0.006%
	132	Thailand	Thailand	7	7	49	0.004%	0.007%	0.007%	0.006%
98	133	United Kingdom	Finland	9	6	43	0.005%	0.007%	0.006%	0.006%
99	134	United States of America	Romania	6	5	64	0.003%	0.005%	0.009%	0.006%
100	135	United Kingdom	China	6	4	68	0.003%	0.005%	0.009%	0.006%
101	136	United Kingdom	Belgium	13	9	6	0.007%	0.009%	0.001%	0.006%
102	137	Netherlands	France	12	5	37	0.006%	0.005%	0.005%	0.006%
103	138	United Kingdom	Portugal	1	1	110	0.001%	0.001%	0.015%	0.005%
104	139	Germany	Switzerland	14	7	10	0.007%	0.007%	0.001%	0.005%
105	140	Denmark	United Kingdom	9	8	22	0.005%	0.008%	0.003%	0.005%
106	141	United Kingdom	Canada	9	5	41	0.004%	0.006%	0.006%	0.005%
107	142	Hong Kong	Thailand	7	7	30	0.004%	0.008%	0.004%	0.005%
108	143	Norway	Denmark	6	4	55	0.003%	0.004%	0.008%	0.005%
109	144	Germany	United Kingdom	11	5	25	0.006%	0.005%	0.004%	0.005%
110	145	Sweden	Finland	10	8	4	0.005%	0.008%	0.001%	0.005%
111	146	Finland	Denmark	7	7	22	0.004%	0.007%	0.003%	0.005%
112	147	United Kingdom	Sri Lanka	8	8	8	0.004%	0.009%	0.001%	0.005%
113	148	Switzerland	Germany	9	6	19	0.005%	0.006%	0.003%	0.005%
114	149	United States of America	South Africa	8	3	42	0.004%	0.003%	0.006%	0.004%
115	150	United Kingdom	Austria	7	5	33	0.004%	0.005%	0.005%	0.004%
116	151	Switzerland	Italy	7	6	21	0.004%	0.007%	0.003%	0.004%
117	152	France	Germany	12	5	15	0.006%	0.005%	0.002%	0.004%
118	153	United States of America	Nigeria	3	2	65	0.002%	0.002%	0.009%	0.004%
119	154	France	Belgium	9	5	21	0.004%	0.005%	0.003%	0.004%
120	155	United Kingdom	Hong Kong	7	4	35	0.003%	0.004%	0.005%	0.004%
121	156	United States of America	Russian Federation	5	3	49	0.003%	0.003%	0.007%	0.004%
122	157	Singapore	Taiwan	6	5	28	0.003%	0.005%	0.004%	0.004%
123	158	New Zealand	Australia	1	1	77	0.001%	0.001%	0.011%	0.004%
124	159	United Kingdom	Taiwan	3	2	59	0.002%	0.002%	0.008%	0.004%
125	160	United States of America	Indonesia	7	7	4	0.004%	0.008%	0.000%	0.004%
126	161	France	Luxembourg	2	1	68	0.001%	0.001%	0.009%	0.004%
127	162	Netherlands	Belgium	9	5	12	0.005%	0.005%	0.002%	0.004%
128	163	Switzerland	Denmark	5	2	48	0.003%	0.002%	0.007%	0.004%
129	164	Belgium	Switzerland	9	4	15	0.005%	0.004%	0.002%	0.004%
130	165	Denmark	Germany	8	6	7	0.004%	0.006%	0.001%	0.004%
131	166	Japan	South Korea	6	4	24	0.003%	0.004%	0.003%	0.004%
132	167	Netherlands Antilles	France	6	6	6	0.003%	0.007%	0.001%	0.004%
133	168	Austria	Germany	7	5	8	0.004%	0.006%	0.001%	0.004%
134	169	Finland	Norway	6	4	21	0.003%	0.004%	0.003%	0.003%
135	170	Netherlands	Italy	2	1	56	0.001%	0.001%	0.008%	0.003%
	171	Slovak Republic	Slovak Republic	6	6	3	0.003%	0.007%	0.000%	0.003%
136	172	Norway	Sweden	7	4	15	0.004%	0.004%	0.002%	0.003%
137	173	Hong Kong	Philippines	5	4	23	0.003%	0.004%	0.003%	0.003%
138	174	France	Switzerland	7	5	3	0.004%	0.006%	0.000%	0.003%
139	175	Germany	France	8	3	18	0.004%	0.003%	0.002%	0.003%
140	176	United States of America	Greece	7	5	2	0.004%	0.005%	0.000%	0.003%
141	177	Germany	Israel	7	4	10	0.004%	0.004%	0.001%	0.003%
142	178	Japan	Singapore	6	3	17	0.003%	0.003%	0.002%	0.003%
143	179	United States of America	Bulgaria	4	2	31	0.002%	0.002%	0.004%	0.003%
144	180	United Kingdom	Singapore	3	3	26	0.002%	0.003%	0.004%	0.003%
145	181	Sweden	Denmark	5	4	14	0.003%	0.004%	0.002%	0.003%
146	182	Denmark	Finland	6	4	3	0.003%	0.005%	0.000%	0.003%
147	183	Switzerland	Sweden	5	5	1	0.003%	0.005%	0.000%	0.003%
148	184	Japan	United Kingdom	6	2	18	0.003%	0.002%	0.003%	0.003%
149	185	Brazil	Argentina	5	5	0	0.003%	0.005%	0.000%	0.003%
	186	Hungary	Hungary	5	5	4	0.003%	0.005%	0.001%	0.003%
150	187	Hong Kong	Australia	5	4	4	0.003%	0.005%	0.001%	0.003%
151	188	Belgium	Ireland-Rep	6	3	11	0.003%	0.003%	0.002%	0.003%
152	189	Italy	France	5	4	4	0.003%	0.005%	0.001%	0.003%
153	190	Israel	United Kingdom	6	3	10	0.003%	0.003%	0.001%	0.003%
154	191	Hong Kong	United Kingdom	4	4	14	0.002%	0.004%	0.002%	0.003%
155	192	Germany	Italy	4	4	10	0.002%	0.004%	0.001%	0.003%
156	193	United States of America	Malaysia	5	5	4	0.002%	0.005%	0.001%	0.003%
157	194	Spain	United Kingdom	4	2	27	0.002%	0.002%	0.004%	0.003%
158	195	United States of America	Turkey	4	3	18	0.002%	0.003%	0.002%	0.003%
159	196	Hong Kong	Japan	4	3	13	0.002%	0.004%	0.002%	0.003%
160	197	Sweden	Iceland	2	2	29	0.001%	0.002%	0.004%	0.002%
161	198	Switzerland	United Kingdom	5	2	17	0.003%	0.002%	0.002%	0.002%
162	199	Netherlands	Canada	4	2	20	0.002%	0.002%	0.003%	0.002%
163	200	Belgium	Canada	4	4	3	0.002%	0.004%	0.000%	0.002%

Appendix 15: Country pairs (private equity) 201-300

	Investment country pairs: Private Equity cross-border and domestic (1980-2005)								3/3
CB	Nr.	Source	Host	Participation	Deal part.	Deal flow	% Part.	% DP	%DF	Activity
164	201	United States of America	Lithuania	2	2	30	0.001%	0.002%	0.004%	0.002%
165	202	Sweden	Switzerland	4	2	12	0.002%	0.003%	0.002%	0.002%
166	203	Taiwan	China	4	3	12	0.002%	0.003%	0.002%	0.002%
167	204	Switzerland	Argentina	4	4	0	0.002%	0.004%	0.000%	0.002%
168	205	United Kingdom	Czech Republic	3	1	24	0.002%	0.002%	0.003%	0.002%
169	206	Denmark	Sweden	5	3	3	0.003%	0.003%	0.000%	0.002%
170	207	Greece	Bulgaria	2	1	29	0.001%	0.001%	0.004%	0.002%
171	208	Taiwan	France	6	2	7	0.003%	0.002%	0.001%	0.002%
172	209	Switzerland	Austria	1	1	31	0.001%	0.001%	0.004%	0.002%
173	210	Switzerland	Portugal	2	2	23	0.001%	0.002%	0.003%	0.002%
174	211	Norway	United Kingdom	4	3	7	0.002%	0.003%	0.001%	0.002%
175	212	United States of America	Portugal	4	1	17	0.002%	0.001%	0.002%	0.002%
176	213	Netherlands	Norway	4	2	7	0.002%	0.003%	0.001%	0.002%
177	214	Taiwan	Japan	3	3	6	0.002%	0.003%	0.001%	0.002%
178	215	United States of America	Colombia	2	2	22	0.001%	0.002%	0.003%	0.002%
179	216	Belgium	Israel	3	3	6	0.002%	0.003%	0.001%	0.002%
180	217	United Kingdom	Poland	3	1	21	0.002%	0.001%	0.003%	0.002%
181	218	Australia	United Kingdom	4	3	3	0.002%	0.003%	0.000%	0.002%
182	219	France	Sweden	5	2	6	0.003%	0.002%	0.001%	0.002%
183	220	Greece	Cyprus	2	2	16	0.001%	0.002%	0.002%	0.002%
184	221	Belgium	Luxembourg	4	2	5	0.002%	0.003%	0.001%	0.002%
185	222	Singapore	Thailand	3	3	3	0.002%	0.003%	0.000%	0.002%
186	223	Belgium	Singapore	3	3	3	0.002%	0.003%	0.000%	0.002%
187	224	Bermuda	United States of America	3	1	20	0.002%	0.001%	0.003%	0.002%
188	225	United States of America	Thailand	3	3	2	0.002%	0.003%	0.000%	0.002%
189	226	United Kingdom	Nigeria	1	1	25	0.001%	0.001%	0.003%	0.002%
190	227	Japan	France	4	1	12	0.002%	0.001%	0.002%	0.002%
	228	Sri Lanka	Sri Lanka	3	3	0	0.002%	0.003%	0.000%	0.002%
191	229	United Kingdom	Kenya	3	3	0	0.002%	0.003%	0.000%	0.002%
	230	Russian Federation	Russian Federation	3	3	0	0.002%	0.003%	0.000%	0.002%
192	231	Japan	China	2	1	19	0.001%	0.001%	0.003%	0.002%
193	232	Belgium	Sweden	5	1	5	0.003%	0.001%	0.001%	0.002%
194	233	Italy	United Kingdom	4	1	13	0.002%	0.001%	0.002%	0.002%
195	234	Luxembourg	Italy	2	2	11	0.001%	0.002%	0.001%	0.002%
196	235	Netherlands	Israel	4	2	6	0.002%	0.002%	0.001%	0.002%
197	236	Czech Republic	Slovak Republic	3	3	2	0.002%	0.003%	0.000%	0.002%
198	237	Canada	South Korea	1	0	27	0.001%	0.000%	0.004%	0.002%
199	238	United Kingdom	Philippines	1	1	21	0.001%	0.001%	0.003%	0.002%
200	239	Brazil	Chile	2	2	9	0.001%	0.002%	0.001%	0.002%
201	240	Sweden	Japan	2	2	9	0.001%	0.002%	0.001%	0.001%
202	241	Canada	United Kingdom	3	2	8	0.002%	0.002%	0.001%	0.001%
203	242	France	Italy	3	3	1	0.002%	0.003%	0.000%	0.001%
204	243	Italy	Belgium	2	2	12	0.001%	0.002%	0.002%	0.001%
205	244	United Kingdom	Russian Federation	2	2	8	0.001%	0.002%	0.001%	0.001%
206	245	Switzerland	Israel	3	3	1	0.002%	0.003%	0.000%	0.001%
207	246	Finland	Lithuania	3	2	4	0.002%	0.002%	0.001%	0.001%
208	247	Netherlands	Denmark	2	2	7	0.001%	0.002%	0.001%	0.001%
209	248	Australia	Italy	1	1	18	0.001%	0.001%	0.003%	0.001%
210	249	Italy	Ireland-Rep	1	1	22	0.001%	0.001%	0.003%	0.001%
211	250	Netherlands	Switzerland	4	1	4	0.002%	0.001%	0.001%	0.001%
212	251	Luxembourg	United Kingdom	3	1	10	0.002%	0.001%	0.001%	0.001%
213	252	Netherlands	Czech Republic	1	0	24	0.001%	0.000%	0.003%	0.001%
214	253	Singapore	India	2	2	8	0.001%	0.002%	0.001%	0.001%
215	254	Singapore	Malaysia	2	2	3	0.001%	0.002%	0.000%	0.001%
216	255	Germany	Netherlands	3	1	10	0.002%	0.001%	0.001%	0.001%
217	256	Singapore	Indonesia	1	1	14	0.001%	0.001%	0.002%	0.001%
218	257	Australia	Canada	2	2	2	0.001%	0.002%	0.000%	0.001%
219	258	United Kingdom	Japan	1	1	14	0.001%	0.001%	0.002%	0.001%
220	259	Australia	Singapore	2	2	2	0.001%	0.002%	0.000%	0.001%
221	260	France	Israel	3	1	3	0.002%	0.002%	0.000%	0.001%
222	261	Luxembourg	France	3	1	6	0.002%	0.001%	0.001%	0.001%
223	262	Netherlands Antilles	Finland	2	2	2	0.001%	0.002%	0.000%	0.001%
224	263	Switzerland	Norway	2	1	11	0.001%	0.001%	0.002%	0.001%
225	264	United Kingdom	Hungary	3	2	1	0.002%	0.002%	0.000%	0.001%
226	265	Finland	Estonia	2	2	0	0.001%	0.002%	0.000%	0.001%
	266	Morocco	Morocco	2	2	4	0.001%	0.002%	0.001%	0.001%
227	267	Switzerland	Netherlands	2	2	0	0.001%	0.002%	0.000%	0.001%
228	268	Switzerland	Canada	2	2	0	0.001%	0.002%	0.000%	0.001%
229	269	United States of America	Estonia	2	2	0	0.001%	0.002%	0.000%	0.001%
230	270	Japan	Hong Kong	2	2	0	0.001%	0.002%	0.000%	0.001%
231	271	United States of America	Iceland	3	1	1	0.002%	0.002%	0.000%	0.001%
232	272	Brazil	United States of America	2	2	3	0.001%	0.002%	0.000%	0.001%
233	273	Norway	Kenya	2	1	9	0.001%	0.001%	0.001%	0.001%
234	274	United States of America	Slovak Republic	2	2	3	0.001%	0.002%	0.000%	0.001%
235	275	United Kingdom	Norway	2	1	5	0.001%	0.001%	0.001%	0.001%
236	276	United States of America	Morocco	1	1	10	0.001%	0.001%	0.001%	0.001%
237	277	Luxembourg	Singapore	1	1	10	0.001%	0.001%	0.001%	0.001%
238	278	Australia	Indonesia	1	1	10	0.001%	0.001%	0.001%	0.001%
239	279	Netherlands	Sweden	2	1	3	0.001%	0.001%	0.000%	0.001%
240	280	Japan	Canada	3	1	5	0.002%	0.001%	0.001%	0.001%
241	281	Singapore	South Korea	2	1	3	0.001%	0.001%	0.000%	0.001%
242	282	New Zealand	United States of America	3	1	2	0.002%	0.001%	0.000%	0.001%
243	283	Israel	France	1	0	14	0.001%	0.000%	0.002%	0.001%
244	284	France	Portugal	2	0	9	0.001%	0.000%	0.001%	0.001%
245	285	United Kingdom	South Africa	3	1	0	0.002%	0.001%	0.000%	0.001%
246	286	France	Canada	2	1	2	0.001%	0.001%	0.000%	0.001%
247	287	India	Singapore	1	0	12	0.001%	0.000%	0.002%	0.001%
248	288	Denmark	Australia	2	1	1	0.001%	0.001%	0.000%	0.001%
249	289	Argentina	United States of America	2	1	5	0.001%	0.001%	0.001%	0.001%
250	290	United States of America	United Arab Emirates	1	1	7	0.001%	0.001%	0.001%	0.001%
251	291	Canada	Germany	2	1	1	0.001%	0.001%	0.000%	0.001%
252	292	United States of America	Croatia	1	1	6	0.001%	0.001%	0.001%	0.001%
253	293	France	Spain	2	2	0	0.001%	0.002%	0.000%	0.001%
254	294	Germany	Hong Kong	2	1	5	0.001%	0.001%	0.001%	0.001%
255	295	United Kingdom	Thailand	1	1	5	0.001%	0.001%	0.001%	0.001%
256	296	United States of America	Algeria	1	1	4	0.001%	0.001%	0.001%	0.001%
257	297	Greece	United States of America	2	1	3	0.001%	0.001%	0.000%	0.001%
258	298	Taiwan	Hong Kong	1	1	0	0.001%	0.001%	0.000%	0.001%
259	299	United States of America	Netherlands Antilles	1	1	3	0.001%	0.001%	0.000%	0.001%
260	300	Brazil	British Virgin	1	1	7	0.001%	0.001%	0.001%	0.001%

Appendix 16: Venture Capital investment: Gravity model analysis with gravity indicators

Gravity model analysis Venture Capital				Participation Numberofobs=2012 F(31,1980)=32.8 Prob>F=0 R-squared=0.3848 RootMSE=0.94335			Deal participation Numberofobs=2012 F(31,1980)=23.54 Prob>F=0 R-squared=0.2723 RootMSE=1.1137			Dealflow Numberofobs=1744 F(31,1712)=17.03 Prob>F=0 R-squared=0.2749 RootMSE=1.6727			Activity % Numberofobs=2012 F(31,1980)=27.93 Prob>F=0 R-squared=0.3369 RootMSE=1.0902		
Indicators	log	Source Host		Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
A) Gravity model indicators				Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
1) Economic mass			(+)												
Population	log	S	(+)	**0.3443**	0.000	0.438	**0.3628**	0.000	0.426	**0.5610**	0.000	0.442	**0.4150**	0.000	0.475
		H	(+)	**0.3864**	0.000	0.517	**0.3314**	0.000	0.409	**0.4979**	0.000	0.414	**0.3876**	0.000	0.466
2) Economic distance			(-)												
Distance	log		(-)	**-0.1883**	0.000	-0.187	**-0.2050**	0.000	-0.187	**-0.3394**	0.000	-0.204	**-0.2479**	0.000	-0.221
Factors eco. distance:			(+)												
Common language			(+)	**0.5652**	0.000	0.194	**0.6175**	0.000	0.195	**0.5724**	0.000	0.124	**0.6479**	0.000	0.199
Common border			(+)	-0.0779	0.346	-0.024	-0.1346	0.172	-0.038	**-0.4557**	0.011	-0.084	**-0.2312**	0.019	-0.064
Common history			(+)	0.2671	0.037	0.044	0.2619	0.062	0.040	**0.4966**	0.025	0.052	**0.3379**	0.018	0.050
Common currency			(+)	**-0.6204**	0.000	-0.111	**-0.6379**	0.000	-0.106	**-0.8976**	0.000	-0.088	**-0.7588**	0.000	-0.122
Common legal system			(+)	**-0.1374**	0.014	-0.056	-0.0534	0.434	-0.020	-0.0773	0.503	-0.019	-0.1058	0.111	-0.039
3) Country pair specific															
Exchange rates		S	(+)	0.0017	0.475	0.015	0.0030	0.287	0.025	**-0.0135**	0.002	-0.075	-0.0012	0.657	-0.010
		H	(-)	**-0.0040**	0.027	-0.041	-0.0004	0.826	-0.004	-0.0055	0.176	-0.033	**-0.0061**	0.004	-0.056
Openness of im- and exports to GDP		S	(+)	0.1341	0.001	0.085	0.0681	0.155	0.040	**0.4084**	0.000	0.162	**0.1999**	0.000	0.113
		H	(+)	0.0528	0.190	0.026	**0.1289**	0.006	0.058	**0.1745**	0.034	0.053	**0.1175**	0.009	0.052
Development		S	(+)	-0.0697	0.698	-0.015	0.0208	0.929	0.004	**0.8977**	0.010	0.119	0.0295	0.888	0.006
		H	(+)	0.0785	0.490	0.024	-0.0444	0.740	-0.013	**-0.5054**	0.041	-0.095	-0.1100	0.430	-0.031
2) Endowment-related variables															
GDP per capita	log	S	(+)	**1.0562**	0.000	0.370	**0.9764**	0.000	0.315	**1.0550**	0.000	0.222	**1.1312**	0.000	0.356
		H	(+)	**0.8492**	0.000	0.424	**0.6163**	0.000	0.283	**0.9876**	0.000	0.306	**0.7972**	0.000	0.357

Appendix 17: Venture Capital investment: Analysis with gravity and banking indicators

Gravity model analysis Venture Capital				Participation Numberofobs=2012 F(45,1966)=31.17 Prob>F=0 R-squared=0.4611 RootMSE=0.88607			Deal participation Numberofobs=2012 F(45,1966)=24.88 Prob>F=0 R-squared=0.3624 RootMSE=1.0462			Dealflow Numberofobs=1744 F(45,1698)=16.05 Prob>F=0 R-squared=0.3233 RootMSE=1.6225			Activity % Numberofobs=2012 F(45,1966)=27.18 Prob>F=0 R-squared=0.4112 RootMSE=1.031		
Indicators	log	Source Host		Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
A) Gravity model indicators				Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
1) Economic mass			(+)												
Population	log	S	(+)	**0.2669**	0.000	0.340	**0.2169**	0.000	0.254	**0.4682**	0.000	0.369	**0.2907**	0.000	0.333
		H	(+)	**0.2553**	0.000	0.342	**0.2543**	0.000	0.314	**0.4178**	0.000	0.348	**0.2937**	0.000	0.353
2) Economic distance			(-)												
Distance	log		(-)	**-0.3486**	0.000	-0.346	**-0.3811**	0.000	-0.348	**-0.4802**	0.000	-0.288	**-0.4119**	0.000	-0.367
Factors eco. distance:			(+)												
Common language			(+)	**0.5422**	0.000	0.186	**0.5860**	0.000	0.185	**0.5301**	0.000	0.115	**0.6095**	0.000	0.187
Common border			(+)	-0.1197	0.137	-0.037	-0.1739	0.072	-0.049	**-0.4106**	0.021	-0.075	**-0.2432**	0.011	-0.067
Common history			(+)	0.1601	0.145	0.026	0.1723	0.175	0.026	0.1982	0.366	0.021	0.2135	0.102	0.032
Common currency			(+)	**-0.4647**	0.000	-0.083	**-0.4212**	0.000	-0.070	**-0.5897**	0.002	-0.058	**-0.5725**	0.000	-0.092
Common legal system			(+)	-0.0931	0.076	-0.038	-0.0036	0.955	-0.001	0.0357	0.750	0.009	-0.0466	0.455	-0.017
3) Country pair specific															
Exchange rates		S	(+)	-0.0037	0.112	-0.034	-0.0030	0.271	-0.025	**-0.0204**	0.000	-0.113	**-0.0064**	0.016	-0.053
		H	(-)	**-0.0079**	0.000	-0.081	**-0.0055**	0.011	-0.051	-0.0079	0.112	-0.047	**-0.0086**	0.000	-0.078
Openness of im- and exports to GDP		S	(+)	0.1403	0.001	0.089	0.0260	0.600	0.015	**0.3674**	0.000	0.146	**0.1693**	0.000	0.096
		H	(+)	0.0711	0.122	0.035	**0.1669**	0.002	0.075	0.1795	0.073	0.054	**0.1286**	0.014	0.057
Development		S	(+)	**0.7412**	0.002	0.160	**0.8577**	0.002	0.171	**1.9563**	0.000	0.258	**1.0561**	0.000	0.205
		H	(+)	**0.5991**	0.000	0.187	**0.4857**	0.003	0.139	0.4829	0.141	0.090	**0.5453**	0.001	0.153
B) Private Equity related indicators															
1) Banking system															
1.1 Size			(+)												
M2 to GDP		S	(+)	-0.0672	0.243	-0.026	-0.0776	0.274	-0.027	-0.1661	0.162	-0.039	-0.0735	0.301	-0.025
		H	(+)	**-0.2433**	0.000	-0.081	**-0.2544**	0.001	-0.078	-0.1096	0.467	-0.023	-0.1360	0.098	-0.041
Private credit to GDP		S	(+)	**0.4780**	0.000	0.211	**0.7069**	0.000	0.288	**1.1202**	0.000	0.305	**0.7001**	0.000	0.278
		H	(+)	**0.3917**	0.000	0.182	**0.4146**	0.000	0.178	**0.4028**	0.004	0.116	**0.3731**	0.000	0.156
1.2 Efficiency			(+)												
Return on assets		S	(+)	0.0009	0.217	0.021	0.0004	0.702	0.008	-0.0007	0.600	-0.010	0.0003	0.707	0.007
		H	(+)	0.0000	0.969	-0.001	-0.0005	0.377	-0.017	0.0008	0.372	0.021	0.0004	0.549	0.013
Operating costs to total assets		S	(-)	-0.0003	0.101	-0.042	**-0.0007**	0.011	-0.081	-0.0004	0.296	-0.035	-0.0003	0.207	-0.037
		H	(-)	-0.0001	0.420	-0.016	-0.0001	0.728	-0.009	0.0005	0.109	0.053	0.0002	0.272	0.031
Net interest margin		S	(+)	**0.1398**	0.000	0.117	**0.1594**	0.000	0.123	**0.2093**	0.014	0.105	**0.1954**	0.000	0.147
		H	(+)	0.0523	0.058	0.055	**0.0868**	0.002	0.085	**0.1156**	0.012	0.077	**0.0821**	0.006	0.078
1.3 Competitiveness			(+)												
Interest rate spread		S	(+)	-0.0062	0.072	-0.040	-0.0056	0.190	-0.033	-0.0076	0.384	-0.025	-0.0059	0.118	-0.034
		H	(+)	-0.0010	0.841	-0.004	-0.0047	0.490	-0.016	-0.0002	0.984	0.000	-0.0010	0.874	-0.003
Number of banks per GDP		S	(+)	0.0000	0.262	0.051	0.0000	0.135	0.074	**-0.0001**	0.046	-0.123	0.0000	0.621	0.023
		H	(+)	**0.0001**	0.000	0.208	**0.0000**	0.020	0.105	0.0000	0.203	0.070	**0.0001**	0.001	0.140
2) Endowment-related variables															
2.2 Corporate eco. conditions			(+)												
GDP per capita	log	S	(+)	**0.3777**	0.013	0.132	0.0636	0.717	0.021	0.0636	0.825	0.013	0.2060	0.211	0.065
		H	(+)	0.1889	0.061	0.094	0.0809	0.490	0.037	0.2422	0.291	0.075	0.1696	0.169	0.076

Appendix 18: Private Equity investment: Gravity model analysis with gravity indicators

Gravity model analysis Private Equity Indicators	log	Source Host		Participation Numberofobs=1167 F(31,1135)=18.41 Prob>F=0 R-squared=0.3681 RootMSE=0.82193			Deal participation Numberofobs=1167 F(31,1135)=9.04 Prob>F=0 R-squared=0.2045 RootMSE=1.016			Dealflow Numberofobs=992 F(31,960)=13.53 Prob>F=0 R-squared=0.3136 RootMSE=1.6414			Activity % Numberofobs=1167 F(31,1135)=13.99 Prob>F=0 R-squared=0.3078 RootMSE=1.0038		
A) Gravity model indicators				Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
1) Economic mass			(+)												
Population	log	S	(+)	**0.3173**	0.000	0.477	**0.2552**	0.000	0.348	**0.7213**	0.000	0.574	**0.3849**	0.000	0.496
		H	(+)	**0.3099**	0.000	0.477	**0.2564**	0.000	0.358	**0.4322**	0.000	0.349	**0.3213**	0.000	0.423
2) Economic distance			(-)												
Distance	log		(-)	-0.0481	0.148	-0.057	-0.0530	0.218	-0.057	**-0.2134**	0.005	-0.132	**-0.1206**	0.004	-0.123
Factors eco. distance:			(+)												
Common language			(+)	**0.2176**	0.003	0.092	**0.2709**	0.002	0.104	**0.5312**	0.001	0.120	**0.3507**	0.000	0.127
Common border			(+)	-0.0401	0.697	-0.015	-0.0841	0.514	-0.028	**-0.5764**	0.009	-0.109	**-0.2643**	0.034	-0.084
Common history			(+)	0.1210	0.373	0.026	0.0941	0.554	0.018	0.2709	0.297	0.031	0.1575	0.335	0.029
Common currency			(+)	**-0.6047**	0.000	-0.119	**-0.6708**	0.000	-0.120	**-1.0448**	0.000	-0.099	**-0.7405**	0.000	-0.125
Common legal system			(+)	0.0822	0.228	0.039	0.1214	0.142	0.053	0.2464	0.105	0.061	0.1117	0.171	0.046
3) Country pair specific															
Exchange rates		S	(+)	**-0.0073**	0.014	-0.074	**-0.0086**	0.025	-0.079	-0.0078	0.184	-0.040	**-0.0082**	0.022	-0.071
		H	(-)	-0.0001	0.959	-0.001	0.0048	0.067	0.051	-0.0004	0.937	-0.002	0.0012	0.669	0.012
Openness of im- and exports to GDP		S	(+)	**0.2092**	0.000	0.132	0.1232	0.060	0.071	**0.5241**	0.000	0.172	**0.2302**	0.000	0.125
		H	(+)	-0.0412	0.374	-0.023	0.0416	0.462	0.021	0.1701	0.149	0.048	0.0723	0.262	0.034
Development		S	(+)	**0.5301**	0.035	0.085	0.3103	0.369	0.045	**0.8865**	0.048	0.073	0.4951	0.095	0.068
		H	(+)	0.0995	0.497	0.035	-0.0026	0.989	-0.001	-0.6646	0.071	-0.118	-0.1260	0.508	-0.038
2) Endowment-related variables															
GDP per capita	log	S	(+)	**0.5276**	0.001	0.163	**0.6003**	0.002	0.169	**1.0293**	0.000	0.167	**0.7401**	0.000	0.196
		H	(+)	**0.6650**	0.000	0.372	**0.4178**	0.000	0.212	**1.2492**	0.000	0.353	**0.7049**	0.000	0.338

Appendix 19: Private Equity investment: Analysis with gravity indicators and banking indicators

Gravity model analysis Private Equity Indicators	log	Source Host		Participation Numberofobs=1167 F(45,1121)=16.07 Prob>F=0 R-squared=0.4296 RootMSE=0.78576			Deal participation Numberofobs=1167 F(45,1121)=10.43 Prob>F=0 R-squared=0.2864 RootMSE=0.96833			Dealflow Numberofobs=992 F(45,946)=11 Prob>F=0 R-squared=0.3458 RootMSE=1.6142			Activity % Numberofobs=1167 F(45,1121)=13.16 Prob>F=0 R-squared=0.3761 RootMSE=0.95896		
A) Gravity model indicators				Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta	Coef.	P>|t|	Beta
1) Economic mass			(+)												
Population	log	S	(+)	**0.2146**	0.000	0.322	0.0795	0.115	0.108	**0.6253**	0.000	0.498	**0.2364**	0.000	0.304
		H	(+)	**0.2621**	0.000	0.403	**0.2777**	0.000	0.388	**0.4055**	0.000	0.328	**0.3201**	0.000	0.422
2) Economic distance			(-)												
Distance	log		(-)	**-0.1530**	0.000	-0.182	**-0.1636**	0.000	-0.176	**-0.3586**	0.000	-0.222	**-0.2231**	0.000	-0.227
Factors eco. distance:			(+)												
Common language			(+)	0.1301	0.075	0.055	0.1628	0.063	0.062	**0.3476**	0.034	0.078	**0.2267**	0.009	0.082
Common border			(+)	-0.0616	0.543	-0.023	-0.1294	0.311	-0.044	**-0.4691**	0.045	-0.089	**-0.2472**	0.046	-0.079
Common history			(+)	0.1995	0.111	0.042	0.2120	0.167	0.041	0.2745	0.320	0.031	0.2328	0.145	0.042
Common currency			(+)	**-0.4302**	0.000	-0.085	**-0.4541**	0.004	-0.081	**-0.7338**	0.022	-0.069	**-0.5125**	0.001	-0.086
Common legal system			(+)	0.0801	0.236	0.038	0.1247	0.130	0.054	0.2628	0.082	0.065	0.1257	0.115	0.051
3) Country pair specific															
Exchange rates		S	(+)	**-0.0115**	0.000	-0.117	**-0.0136**	0.001	-0.125	**-0.0133**	0.038	-0.067	**-0.0121**	0.001	-0.105
		H	(-)	-0.0027	0.272	-0.031	0.0010	0.716	0.011	0.0004	0.945	0.002	0.0000	0.989	0.000
Openness of im- and exports to GDP		S	(+)	**0.2369**	0.000	0.150	0.1411	0.059	0.081	**0.6012**	0.000	0.198	**0.2332**	0.001	0.126
		H	(+)	0.0018	0.973	0.001	**0.1408**	0.036	0.071	0.2127	0.112	0.061	**0.1511**	0.039	0.072
Development		S	(+)	**1.9368**	0.000	0.310	**2.0406**	0.000	0.297	**2.6679**	0.000	0.219	**2.1845**	0.000	0.300
		H	(+)	**0.3915**	0.047	0.139	0.3347	0.163	0.108	0.4624	0.347	0.082	0.4464	0.056	0.136
B) Private Equity related indicators															
1) Banking system															
1.1 Size			(+)												
M2 to GDP		S	(+)	**-0.1911**	0.007	-0.082	**-0.2495**	0.006	-0.097	-0.1150	0.506	-0.026	**-0.1773**	0.045	-0.065
		H	(+)	**-0.2684**	0.001	-0.104	**-0.3119**	0.003	-0.110	-0.0703	0.715	-0.014	**-0.3146**	0.002	-0.105
Private credit to GDP		S	(+)	**0.5061**	0.000	0.277	**0.6990**	0.000	0.347	**0.5331**	0.011	0.155	**0.6899**	0.000	0.323
		H	(+)	**0.2450**	0.004	0.138	0.1831	0.077	0.094	0.3235	0.105	0.097	**0.3062**	0.004	0.148
1.2 Efficiency			(+)												
Return on assets		S	(+)	-0.0005	0.057	-0.011	0.0007	0.109	0.012	0.0004	0.606	0.004	0.0001	0.873	0.001
		H	(+)	0.0002	0.740	0.008	0.0003	0.596	0.015	0.0001	0.918	0.004	0.0004	0.609	0.015
Operating costs to total assets		S	(-)	0.0003	0.272	0.035	0.0001	0.703	0.015	0.0005	0.431	0.029	0.0003	0.373	0.030
		H	(-)	-0.0001	0.587	-0.017	-0.0001	0.674	-0.015	**0.0009**	0.030	0.101	0.0003	0.223	0.054
Net interest margin		S	(+)	**0.1734**	0.003	0.162	**0.2321**	0.000	0.197	**0.5372**	0.000	0.257	**0.2609**	0.000	0.209
		H	(+)	**-0.0806**	0.036	-0.081	-0.0605	0.181	-0.055	0.0552	0.506	0.029	-0.0583	0.214	-0.050
1.3 Competitiveness			(+)												
Interest rate spread		S	(+)	**0.0169**	0.012	0.061	**0.0189**	0.016	0.062	-0.0110	0.770	-0.014	**0.0159**	0.046	0.049
		H	(+)	-0.0040	0.580	-0.015	-0.0041	0.683	-0.014	0.0037	0.779	0.007	-0.0015	0.841	-0.005
Number of banks per GDP		S	(+)	0.0000	0.589	0.042	0.0000	0.508	0.056	0.0000	0.295	-0.110	0.0000	0.989	-0.001
		H	(+)	**0.0000**	0.029	0.137	0.0000	0.625	0.034	0.0000	0.577	0.043	0.0000	0.638	0.029
2) Endowment-related variables															
2.2 Corporate eco. conditions			(+)												
GDP per capita	log	S	(+)	**-0.5201**	0.025	-0.161	**-0.8473**	0.002	-0.238	-0.0540	0.890	-0.009	**-0.6155**	0.022	-0.163
		H	(+)	**0.2963**	0.024	0.166	0.2153	0.186	0.109	0.5717	0.099	0.161	0.2958	0.064	0.142