

Charles University in Prague

Faculty of Social Sciences
Institute of Economic Studies



BACHELOR THESIS

Drivers of private equity fundraising and investment: Comparison of Central and Eastern Europe and Western Europe

Author: **Albert Jelínek**

Supervisor: **PhDr. Pavel Streblov, Msc.**

Academic Year: **2012/2013**

Bibliographic record

JELÍNEK, A. *Drivers of private equity fundraising and investment: Comparison of Central and Eastern Europe and Western Europe.* (Bachelor thesis) Charles University in Prague

Volume: 69 798 characters

Declaration of Authorship

The author hereby declares that he compiled this thesis independently, using only the listed resources and literature. This thesis was not used to obtain another academic degree.

The author grants to Charles University permission to reproduce and to distribute copies of this thesis document in whole or in part.

Prague, May 17, 2013

Signature

Acknowledgments

The author is grateful especially to his supervisor PhDr. Pavel Streblov, Msc. for his comments, support and guidance.

The author would also like to express deepest gratitude to Michael White, Ewan Gibb and Hammond Alastair for their advices and providing passion to the topic.

Special thanks to Anne Hutton for her support and invaluable guidance. Thanks to Barbora Knappova for her deep patience and support.

Abstract

This thesis is focused on investment and fundraising in private equity and aims to contribute to the understanding of the factors that influence it. The thesis is unique since it investigates common determinants of fundraising and investment and compares them between Central and Eastern Europe and Western Europe. We consider macro-determinants as well as determinants directly related to the private equity cycle. The thesis is based on two datasets running from 2002 to 2011 and each dataset consists data of three countries with the largest private equity markets in the region. We selected the UK, Germany and Sweden as representatives of Western Europe and the Czech Republic, Hungary and Poland as representatives of Central and Eastern Europe. We use panel data method for our research. The results show that the main common determinants of private equity fundraising and investment in both regions are determinants directly related to the private equity cycle and market capitalisation.

JEL Classification C33, E22, E44, F21 G24, G30

Keywords private equity, venture capital, fundraising, investment

Author's e-mail albertjelinek@seznam.cz

Supervisor's e-mail streblov@hotmail.com

Abstrakt

Tato práce je zaměřena na fundraising a investice v private equity a jejím cílem je přispět k porozumění faktorům které toto ovlivňují. Tato práce je unikátní tím, že se snaží nalézt společné determinanty fundraisingu a investic a porovnává je mezi Střední a Východní Evropou a Západní Evropou. V rámci této práce zkoumáme makroekonomické determinanty stejně tak jako determinanty přímo spojené s cyklem private equity. Náš výzkum je založen na dvou datasetech obsahující data z let 2002 až 2011 a každý z těchto datasetů obsahuje data tří zemí s největším private equity trhem. Zvolili jsme Spojené Království, Německo a Švédsko jako zástupce zemí Západní Evropy a Českou Republiku, Maďarsko a Polsko jako zástupce Střední a Východní Evropy. Pro náš výzkum používáme metodu panelových dat. Na základě získaných výsledků můžeme říci, že hlavními společnými determinanty fundraisingu a investic v private equity v obou regionech jsou determinanty přímo spojené s private equity cyklem a tržní kapitalizace.

Klasifikace JEL

C33, E22, E44, F21 G24, G30

Klíčová slova

private equity, venture capital, fundraising, investice

E-mail autora

albertjelinek@seznam.cz

E-mail vedoucího práce

streblov@hotmail.com

Contents

List of Tables	ix
List of Figures	x
Acronyms	xi
Thesis Proposal	xii
1 Introduction	1
2 Private Equity	3
2.1 Introduction to Private Equity	3
2.1.1 Private equity cycle	4
2.2 Private Equity in Western Europe	5
2.2.1 Germany	6
2.2.2 Sweden	8
2.2.3 United Kingdom	9
2.3 Private Equity in Central and Eastern Europe	11
2.3.1 The Czech Republic	13
2.3.2 Hungary	14
2.3.3 Poland	15
3 Theory	17
3.1 Fundraising	17
3.2 Investment	18
4 Data	21
4.1 Data	21
4.1.1 Data on fundraising	23
4.1.2 Data on investment	24

5	Models & methodology	25
6	Results	28
6.1	Overall results	28
6.2	Results - Fundraising	29
6.3	Results - Investment	30
6.4	Discussion - Values of R^2	32
7	Conclusion	33
	Bibliography	37
A	Tables	I
B	Figures	VII

List of Tables

A.1	Regression results	I
A.2	Correlation table - CEE	II
A.3	Correlation table - Western Europe	II
A.4	Estimation results CEE - Fundraising	III
A.5	Estimation results Western Europe - Fundraising	IV
A.6	Estimation results CEE - Investment	V
A.7	Estimation results Western Europe - Investment	VI

List of Figures

2.1	Fundraising & investment in Western Europe	6
2.2	Fundraising & investment in Germany	7
2.3	Fundraising & investment in Sweden	9
2.4	Fundraising & investment in the United Kingdom	10
2.5	Fundraising & investment in CEE	12
2.6	Fundraising & investment in the Czech Republic	14
2.7	Fundraising & investment in Hungary	15
2.8	Fundraising & investment in Poland	16
B.1	Sources of capital raised for CEE	VII
B.2	Sources of capital raised for Western Europe	VIII
B.3	Geographic sources of capital raised for CEE	VIII
B.4	Geographic sources of capital raised for Western Europe	IX

Acronyms

CEE	Central and Eastern Europe
Div	Divestment
EBRD	European Bank for Reconstruction and Development
EU	European Union
EVCA	European Private Equity and Venture Capital Association
Fr	Amounts of funds raised
GDP	Gross Domestic Product
GDPgr	Gross domestic product growth
GDS	Gross domestic savings
GP	General Partner
IFC	International Finance Corporation
Inv	Investment
IPO	Initial Public Offering
IR	Interest rates
IRR	Internal rate of return
LP	Limited Partner
MCAP	Market capitalisation
OECD	Organisation for Economic Co-operation and Development
PCF	Private capital flows
PE	Private Equity
RnD	Research and development
SME	Small and medium sized companies
SMR	Stock market return

Bachelor Thesis Proposal

Author	Albert Jelínek
Supervisor	PhDr. Pavel Streblov, Msc.
Proposed topic	Drivers of private equity fundraising and investment: Comparison of Central and Eastern Europe and Western Europe

Topic characteristics Private equity industry in Central and Eastern Europe (CEE) and Western Europe in the last decade experienced two extremes. Strong growth and deep decline. The industry in both regions recovers however, it seems that the full recovery will take time. Fundraising in CEE as well as in Western Europe becomes more difficult than before the crisis. Investors are less willing to commit their capital to private equity in CEE and private equity companies in Western Europe also register difficulties with raising new funds. Investment activity grows in both regions however, there are signs of lacking demand for private equity capital from entrepreneurs. Therefore it is interesting to try to find the determinants for fundraising and investment and try to find out if there are common determinants. Moreover we try to compare them between CEE and Western Europe. Our research is unique since we use the latest data available.

Hypotheses The aim of this thesis is to find out if there are common determinants of private equity fundraising and investment and try to find out if there are differences between them in CEE and Western Europe.

Methodology To analyse the common determinants of private equity fundraising and investment and compare them between CEE and Western Europe, we use two datasets running from 2002 to 2011. One consisting of data from representative countries of CEE and the other consisting data of representative

countries of Western Europe. We chose the Czech Republic, Poland and Hungary from CEE region and the UK, Sweden and Germany from Western Europe. We use panel data methodology.

Outline

1. Introduction to private equity
2. Theoretical Background
3. Data
4. Models and Methodology
5. Empirical part
6. Conclusion

Core bibliography

1. BALBOA, M. & J. MARTÍ (2003): “An integrative approach to the determinants of private equity fundraising.” *EFMA 2004 Basel Meetings Paper*
2. BALBOA, M. & J. MARTÍ (2009): “The double market approach in venture capital and private equity: The case of Europe.” *EU VII Programme, Financing Entrepreneurial Ventures in Europe*
3. BERNOTH, K. et al. (2010): “Drivers of private equity investment in CEE and Western European countries.” *DIW Berlin Discussion Paper*
4. GOMPERS, P.A. & J. LERNER (1999): “What drives venture capital fundraising?.” *National Bureau of Economic Research*
5. JENG, L.A. & P.C. WELLS (2000): “The determinants of venture capital funding: evidence across countries.” *Journal of corporate Finance* **6(3)**: pp. 241–289.

Author

Supervisor

Chapter 1

Introduction

Private Equity (PE) is now considered as the cornerstone for commercialization and innovation in modern economies, it has a clear and measurable positive impact on economies confirmed by many studies. Private equity in Europe in the last decade experienced two extremes, boom and fall. In the years 2005-2006 the PE industry grew tremendously and it was the period of the highest amounts raised and invested. Private equity in CEE after the accession of new countries to EU in 2004 grew significantly as well and number of new funds and PE companies were founded. The second negative extreme was the consequence of economic crisis in 2008. The fundraising and investment fell sharply and the PE industry suffered a strong downturn. Although in Western Europe it regains its previous numbers, the private equity industry in CEE is struggling to recover. The levels of fundraising remain low and the typical PE investors are vanishing. The private equity industry in CEE is catching up with its counterpart the PE industry in Western Europe and it is interesting to observe what drives the industry in developed market and what drives it in an emerging or almost emerged one.

The objective of this thesis is to identify the determinants of private equity fundraising and investment, compare them between CEE and Western Europe and recognize common determinants for fundraising and investment in both regions. We consider macro determinants as well as the ones directly related to the private equity process. The variables are chosen based on previous works about determinants of fundraising and investment. There are papers about differences in fundraising in CEE and Western Europe as well as papers about differences in investment between these regions but there is no literature that

would try to find common determinants for investment and fundraising and compare them between CEE and Western Europe. Furthermore, the literature about determinants of fundraising and investment is scarce and it is not recent on the contrary this thesis is based on data from 2002-2011, the latest data available.

The thesis uses data from three countries from CEE and three countries from Western Europe as representatives of the regions. We have chosen countries with the greatest private equity markets from both regions.

The United Kingdom is the biggest PE market in Europe with the highest volumes of fundraising, investment and divestment. German and Swedish PE industries are one of the largest in Europe, even though they are significantly smaller than the PE industry in the UK. Poland is the leading PE market from CEE with the greatest volumes of fundraising, investment and divestment. Hungarian private equity is the second largest in CEE region, although its activity is declining. Private equity in the Czech Republic is significantly smaller than PE in Poland; however, it is the third largest PE market in CEE

The thesis is structured as follows: Chapter 2 gives us an introduction to private equity and describes the development of PE in each country we have chosen from CEE and Western Europe. Chapter 3 talks about the theory of fundraising and investment in private equity. Chapter 4 describes data from private equity and the data we use in our thesis. Chapter 5 presents the methodology applied and the models we use. Chapter 6 talks about results of our regressions. Chapter 7 summarizes our findings and discusses the implications of our results.

Chapter 2

Private Equity

2.1 Introduction to Private Equity

There are many definitions of private equity and it is up to us to find the proper one. This paper will work with the definition published by European Private Equity and Venture Capital Association (EVCA). According to EVCA, "Private equity is equity capital provided to enterprises not quoted on a stock market. Private equity includes the following investment stages: venture capital, growth capital, replacement capital, rescue/turnaround and buyouts". There is number of articles that use the term venture capital as a synonym to the term PE. According to Sedláková (2008), this occurs in Continental Europe. The definition used in the USA divides private equity to venture capital and buyout thus it is similar to EVCA definition.

The history of private equity starts in 1940s in the USA when the first venture capital company was established. Its name was American Research and Development and it was founded in 1946 (Dominguez 1974). Private equity became widespread during 1970s in the USA and Western Europe. Since then we can observe rapid growth of private equity (Sedláková 2008).

Private equity is complement of corporate financing, providing financing for start-up firms, private middle-market firms, firms in financial distress and for buyout of public or private firms. Furthermore, private equity is now considered as the cornerstone for commercialization and innovation in modern economies (Bernoth *et al.* 2010), as it has clear and measurable positive impact on economies which is confirmed by many studies (Rajchlová *et al.* 2011). A PE company is an intermediary between investors on one side and entrepreneurs

on the other. Private equity companies reduce the information asymmetry between investors and entrepreneurs, providing their expertise and knowledge in sourcing and assessing new ventures and allowing investors to invest in projects that uninformed outsiders would reject (Barnes & Menzies 2005).

2.1.1 Private equity cycle

In PE we can talk about cyclical process or cyclical behaviour (Balboa & Martí 2003), which means that stages of private equity periodically repeat. The three most important stages are fundraising, investment in companies and in the end divestment. This paper is focused on the first and second stage and we will talk about it in more detail in Chapter 3. However, we will shortly describe the whole process here.

Fundraising is a process during which PE company raises money from investors and forms a private equity fund; these are usually formed as limited partnerships. The investor of the fund is Limited Partner (LP) and private equity company respective fund manager is General Partner (GP). Both are responsible for management of the fund. PE funds are traditionally closed-end funds, which means that investors can invest only during fundraising period. Once the fund is closed it is not possible to invest more nor exit the fund before its life-end. Private Equity funds are usually formed for ten to twelve years and during this time GPs must invest committed capital and later divest it. Fundraising is a process that usually takes 12 to 18 months, depending on skills and reputation of fund managers.

The investment stage begins when the fund is closed and GPs may start to screen for investment opportunities. This stage lasts usually three to five years during which all committed should be invested¹. Companies that are acquired during investment phase are acquired with clear business plan, clear financial targets and with a view to make the company attractive to future buyers. Some companies are brought to the portfolio already with known exit strategy. After this initial investment comes the managing and monitoring phase. During this phase GPs use all their skills, knowledge and network of relationships to raise the value of companies in funds portfolio. Fund managers are active in managing portfolio companies. They are usually in Board of Directors and they can

¹It should be invested all because GPs are paid by annual fee which is usually between 1.5 and 3 percent of the total capital raised and LPs would not like to pay fee from capital that was not used.

act as advisors to company managers. GPs can hire new management or they can help with choosing of new staff, forming portfolio company strategy and they can assist with arranging of additional financing².

Divestment period is the ending stage of funds life-cycle and it is its crucial part. This stage shows how successful was the investment and what was the Internal rate of return (IRR) measuring the "success" of the investment. IRR targets are usually set between 20 and 30 percent. It has to be determined which way the exit will be done and when the best time to exit the investment is. Investments are done for five to seven years but it is not exactly specified when the exit will be made. Predominantly it depends on the actual position of the company on the market that can be influenced by many factors, such as global recession, capital requirements, new regulatory rules, its business life-cycle etc.. Exit can be done through trade sale, buy back, sale to other private equity investors, write-off or IPO.

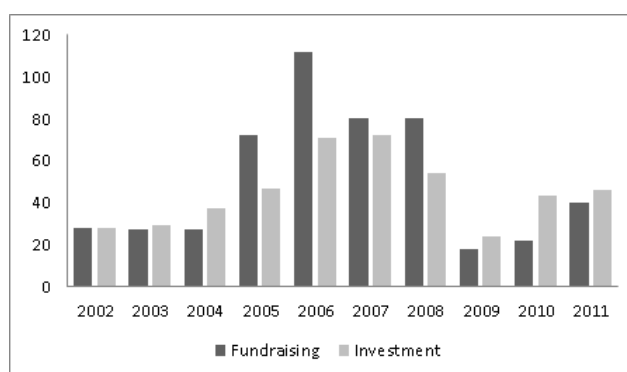
2.2 Private Equity in Western Europe

Private equity in Western Europe is one of the strongest and most attractive private equity markets in the world. As we mentioned earlier, private equity was firstly introduced in the USA in the 1940s, in Europe first PE ventures occurred in the 1970s (Martí & Balboa 2001). In the beginning there were mostly venture capitalist but in the 1980s, they changed their focus from early-stage investments to buy-out and other later stage investments (Balboa & Martí 2003). In the 1980s the limited partnership was the most common setting of PE and closed ended funds accounted for 75 to 80 percent of all funds (Martí & Balboa 2001). In 1987 the amount of funds raised was €2.9 billion, this amount grew to €48 billion in 2000 (Balboa & Martí 2003). According to Tykvová *et al.* (2012) Europe today faces a combined problem of supply shortage, demand shortage and thin markets. Fundraising in Western Europe after crisis became more difficult. Tykvová *et al.* (2012) also states that there is only small amount of prospective high-tech enterprises that have potential for high growth. Moreover European private equity funds are relatively small and low-experienced and therefore they are not able to gain funding from large institutional investors (Tykvová *et al.* 2012). As we can see on the graph below

²The degree of involvement of fund managers in managing portfolio company varies depending on the specific project and portfolio company. Company in earlier stage of growth needs more managerial effort than other more mature enterprises.

the private equity industry in Western Europe experienced tremendous boom which started in 2004. Fundraising nearly quadrupled between 2004 and 2006. Investment grew as well, however not as steeply as fundraising. Private equity industry was hit by crisis with short delay thus the fall came in year 2009. The industry recovers however the amounts raised and invested are far from what the numbers before the crisis.

Figure 2.1: Fundraising & investment in Western Europe



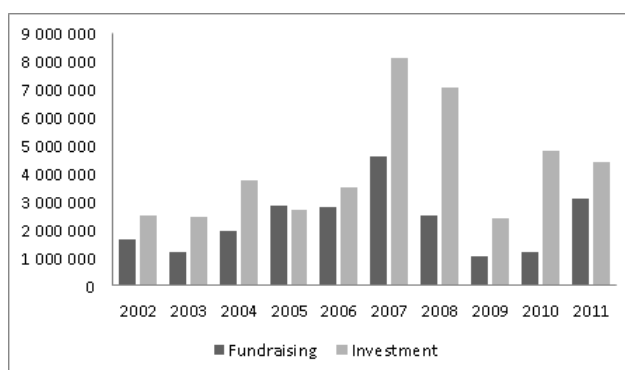
Source: EVCA yearbook 2012, BVK Special Private Equity in Europa 2002-2006
 Amounts in billions of €

2.2.1 Germany

Today the private equity industry in Germany is one of the largest in Europe. The financial system of Germany is a representative of the bank-based system which was not the most appropriate environment for the development of the PE industry, compared to Anglo-Saxon market-based systems (Dubocage & Rivaud-Danset 2004). In mid-1960s the first private equity company, Deutsche Beteiligungsgesellschaft, was founded in Germany by the government and major German banks. This was mainly a venture capital company providing finance to companies not publicly listed. In 1975, German government initiated experiment in venture capital and the fund Deutsche Wagnisfinanzierungsgesellschaft was founded. This was motivated by the facts that Germany was falling behind the US, UK and France in technological innovations and the government saw solution in venture capital. Moreover, Germany was also experiencing an equity gap that could be solved by this as well. This experiment was cancelled in 1984, since most of the financed companies had gone bankrupt. For the next decade the venture capital financing almost vanished from German PE market. In 1980s the first buy-out funds emerged but the private equity activity was

still small and there were only very few PE transactions during the first half of 1980s. The first concrete steps towards the introduction of leveraged buy-outs were linked to German family offices (Jowett & Jowett 2011). The German government wanted to overcome the handicap of bank-based financial system and it started to intervene in favour of development of stronger PE industry. The second half of 1980s was the period when PE companies oriented on leveraged buy-outs and it was a period of significant boom of PE activity in Germany. The main sources of private equity transactions in Germany in the years 1984-1990 were buy-outs of family businesses. In the beginning of 1990s a number of new PE companies were founded and many of them opened offices in Germany and just a minority continued to operate from London. The investments in 1990 totalled €530 million and they continuously grew until the year 2000. In the years 1992-1994 German PE activity was boosted from German reunification as new investment opportunities came up. The year 1997 was brake point for German PE and the beginning of a new era. The investments grew from €715 million to €4767 million in 2000 and the volume of deals flourished. In 1990s the buy-outs of family businesses were still major source of PE transactions. In the year 2001 the investments dropped sharply to €2500 million and remained about the same until 2006 when it grew to €3518 million as we can see on the graph below. The same trend was followed by fundraising. Investment as well as fundraising peaked in 2007 then sharp decline came caused by crisis. In year 2010 the situation improved and investment as well as fundraising started to grow again to previous numbers.

Figure 2.2: Fundraising & investment in Germany



Source: EVCA yearbook 2012, BVK Special Private Equity in Europa 2002-2006
Amounts in thousands of €

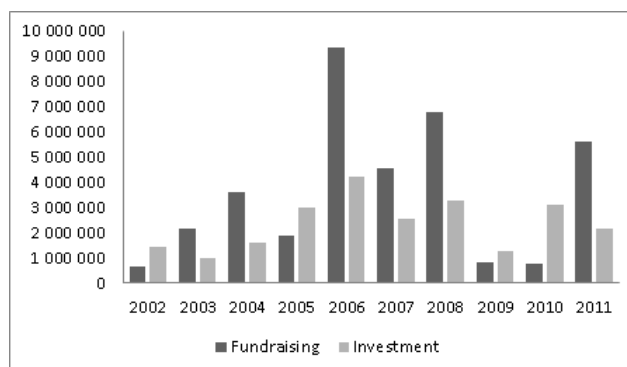
2.2.2 Sweden

In 1970s the Swedish economy as well as other world economies entered stagnation due to the oil crises. Swedish industrial production was strongly affected and between the years 1973 and 1982 the production fell by 25 percent. The Swedish government saw the way out of this situation through private equity investments. The government supported the establishment of new development funds that supported Small and medium sized companies (SME). The first Swedish private equity company Foretagskapital was established in 1973 and the owners were merchant banks and the state. Between the years 1975 and 1981 many other regional development funds were established by the government.

The important period for the development of Swedish PE started in 1980 when the government commission Nodenfalk suggested that the government should stimulate the creation of private investment companies for small businesses (Karaomerlioglu & Jacobsson 2000). In 1982 the first investment company based on the recommendation of Nodenfalk was established. Important for the development of PE industry was allowing institutional investors to invest into SME. Additionally taxes were reduced. All this helped to a significant increase of capital inflow to PE. During the late 1980s the PE industry stagnated, however the number of funds increased.

The second wave of PE boom in Sweden started in early 1990s and in 1992 the Swedish PE reached the highest number of funds on the market. The scenario in 1990s was similar to the previous decade. After the stock market crash in 1989 and the economic crisis in 1991 the Swedish government decided again to pursue policies of supporting SME and private equity was the tool to do it (Karaomerlioglu & Jacobsson 2000). The government established new institutions, introduced the tax and stock market reform and pumped money to PE market. During the second half of 1990s the amounts fundraised and invested grew sharply. In 1998 the amount invested was €202 million and in 1999 it was already €1277 million and it peaked in 2000 when investment climbed to €2300 million. As we can see on the graph below, after this tremendous PE boom there came a period of slower growth that ended in 2008 when the crisis hit Swedish PE industry and volumes fell sharply. In 2007 the amount raised was €6.8 billion and in 2008 only €826 million. Crisis in Sweden did not last long and in 2011 the amount raised grew to €5.6 billion.

Figure 2.3: Fundraising & investment in Sweden



Source: EVCA yearbook 2012, BVK Special Private Equity in Europa 2002-2006.
Amounts in thousands of €

If we look at Sweden from the regional point of view, we must conclude that the Swedish private equity industry is the largest and the most active from the Nordic states. The volumes raised and invested are several times higher than in Finland, Norway and Denmark. The strong participation of government is typical for all the Nordic states as well as the large share of domestic investors.

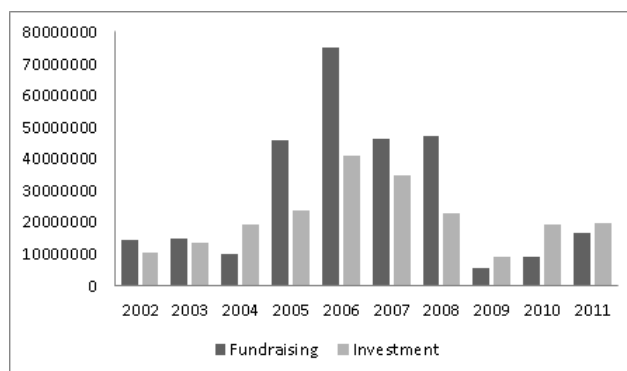
2.2.3 United Kingdom

In the United Kingdom the private equity industry is the second biggest in the world and the largest and the most active in Europe. The amounts of funds raised in the UK in the years 2007 and 2011 were on average 46 percent of the total in Europe and investment in these years was on average 42 percent of the total investment in Europe (EVCA 2012). In the UK there are many offices of the international as well as a te regional funds that focus on investment in countries other than the UK.

The private equity industry in the UK started in late 1970s when the interest of governmental and private investors to invest in SME grew (Morgan 2009). After the economic downturn in 1982, the PE industry started to grow and from €144 million raised in 1983 it grew to €1975 million raised in 1989. Fundraising dropped sharply in the years 1990-1993 during the recession and the investment declined by 20 percent. The rest of 1990s was the period of strong growth of PE in the UK. The major investors were pension funds, banks and insurance companies. Fundraising grew from €0.82 billion in 1993 to €14.6 billion in 2000. Between the years 2001 and 2003 the fundraising kept around

€14 billion each year and investment after fall to €7 billion in 2001 grew again to €13 billion in 2003. The year 2004 was specific since new countries joined the EU and new investment opportunities came. The fundraising in 2004 in the UK declined and on the contrary investment grew significantly. The year 2005 was the beginning of the extreme growth of PE industry. Fundraising grew from €10 billion in 2004 to €75 billion in 2006 and investment grew from €24 billion in 2004 to €41 billion in 2006. After this period the growth ended and turned into fall. Crisis hit the private equity industry in the UK significantly.

Figure 2.4: Fundraising & investment in the United Kingdom



Source: EVCA yearbook 2012, BVK Special Private Equity in Europa 2002-2006.
Amounts in thousands of €

The legal framework in the UK differs from others in Europe as it is based on common law. The UK financial service is the representative of the market-based financial system. This brings also differences in regulation of PE industry. According to Caselli (2010), the general idea in the UK is that the market discipline is more important and powerful than regulators, thus investing in equity is not regulated by the financial system laws. Therefore PE investments is not in category of financial services and it is not supervised. In Continental Europe, the private equity is considered as financial service. It is supervised and this leads to different financial environments. The British legal framework is very similar to the framework in the US and since the private equity was founded in the US there are many similarities between the legal frameworks for equity investors in the US and in the UK (Dubocage & Rivaud-Danset 2004).

2.3 Private Equity in Central and Eastern Europe

The private equity history in CEE³ begins in the early 1990s when the region started transformation from the centrally planned economies to the market economies. PE in CEE region has therefore shorter history than in Western Europe and the volumes of fundraising and the volumes of investment as a fraction of GDP are significantly lower than in Western Europe (Bernoth *et al.* 2010).

The transition process was an important driver for the first private equity activity in the CEE region. Economic stabilization, reduction of interest rates, convertibility of local currencies and privatization of state enterprises were the drivers that started the PE activity in CEE (Groh *et al.* 2008). CEE started to grow rapidly and also due to the favourable location near Western Europe it had positive economic outlook. The privatization process was the cornerstone for the first PE investments in the region. According to Klonowski (2006), the first funds established in the CEE region were Hungarian-American Enterprise Fund (\$70 million), the Polish-American Enterprise Fund (\$240 million), both founded in 1990 and the Czech Slovak American Enterprise Fund (\$15 million) that was founded in 1991 (Klonowski 2006). The main investor of these funds was American Congress and the other investors were International Finance Corporation (IFC) and the European Bank for Reconstruction and Development (EBRD). CEE experienced economic slow down between the years 1998 and 2003. The amount of fundraising fell from \$517 million in 1998 to \$144 million in 2003. It was not only because the downturn in CEE, but also the investors were afraid of consequences of the crisis in Russia.

The year 2004 was crucial for the development of private equity in CEE, since it was the year when the Baltic countries, Poland, the Czech Republic, Slovakia, Hungary, Slovenia and Malta joined the European Union (EU). The positive impact can be seen on figures of all the new member countries. The amounts raised grew significantly and investment activity flourished as well as the region became less risky for the investors. In CEE region funds are usually regional funds focusing on the whole region and the number of funds focusing on one country only is very small. The size of markets in each CEE country is relatively small and the investors look at the region as a whole. This brings drawbacks since the countries look similar but there are differences that should not be

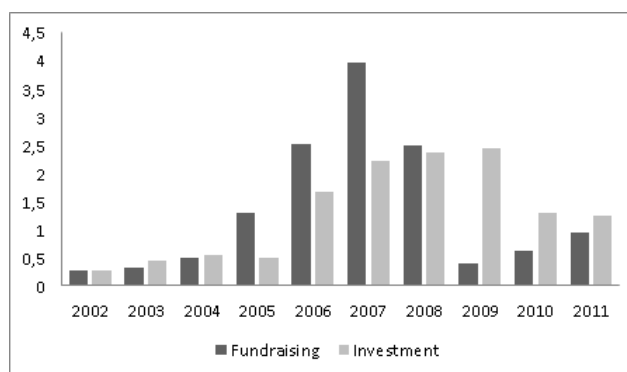
³CEE countries are Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

generalized. This can be seen on how the countries economies coped with the crisis and how healthy is their financial and public system.

The private equity industry in CEE after the economic crisis is facing difficulties with fundraising and with declining supply of capital for private equity. One of the reasons for that is that the investors from the USA that used to be the major foreign investors to the private equity in CEE lost interest in investing to private equity in CEE region and almost disappeared. This may be caused by problems of Eurozone like Greek crisis, Spanish and Italian high yields on government bonds etc.. The US investors do not differentiate and they look on Europe as on one region so they are not willing to commit their capital to CEE. Other problem is that CEE region is no more typical emerging private equity market and it is now viewed as emerged and still emerging. It has lost the appeal of emerging market with a lot of high yield investment opportunities. Therefore some LPs that used to invest in CEE region look for investment opportunities elsewhere. From the capital committed to private equity in all emerging markets 25% was invested in PE in CEE in 2006 and this dropped to only 5% in 2009.

The typical PE investors like pension funds are investing less in PE. This is caused by changes in regulation of pension funds. In some CEE countries they were allowed to invest in PE, however a recent trend is that pension funds are more regulated and governments start to control them more than before. This is the case of Poland and Hungary.

Figure 2.5: Fundraising & investment in CEE

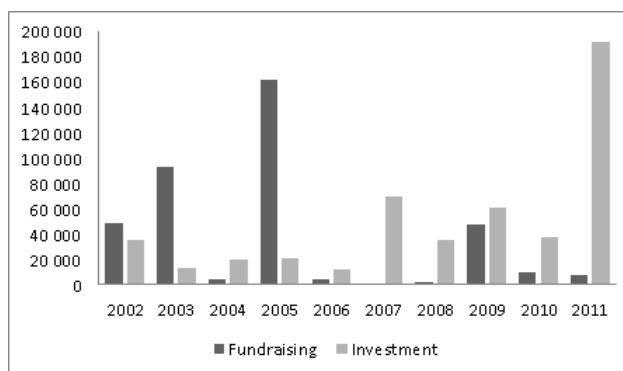


Source: EVCA yearbook 2012, BVK Special Private Equity in Europa 2002-2006
Amounts in billions of €

2.3.1 The Czech Republic

Private equity in the Czech Republic started its history in early-1990s right after the Velvet revolution that brought the communist regime to the end. We can divide the development of PE industry into four stages. The first stage (1991-1998) was quite poor regarding the volume of deals and there were only 4 funds operating in the Czech Republic. The first PE fund was formed in 1991 and it was called Czech-American Entrepreneurial Fund and its main investors were EBRD and the American Congress. Similar funds were then formed in 1994, they were both invested by European Union's Phare Program (Sedláková 2008). Renaissance Partners formed in 1995 was the first fund with traditional investors. This fund raised the amounts invested in the Czech Republic, but the trend of PE industry development was not as positive as in Poland or Hungary, where the industry grew much faster. The reason for that was also the fact that the three first funds were founded as foundations and as such they were regulated. This regulation did not allow foundations to run business or to participate in doing business of third person (Sedláková 2008). Therefore the PE activity of foundations ended in the mid 1990s. During the first period the capital was used for start-up and expansion investments. In 1998 the PE industry started to grow when the number of new PE funds entered the Czech market, among them were Erste Private Equity Limited, Riverside, Conti Private Equity and Arx Equity. This started the second period (1999-2006) of PE development. In 2001, the fundraising declined as a result of world economic downturn, however in the years 2002 and 2003 fundraising grew significantly and in 2005 the fundraising reached €162 million which was the highest amount raised in the Czech PE industry. After the year 2005, the fundraising activity remained low in the Czech republic. In 2006 EBRD finished supporting the Czech private equity industry, that was agreed by the Czech government and EBRD, since the Czech government wanted to be the first CEE country that has an independent PE industry that is not supported by EBRD. This however makes fundraising even more difficult in post crisis period that is typical for demand for capital from government institutions and institutions like EBRD and IFC. Another constraint of fundraising is that the Czech Republic is according to EVCA (2008), that indicates the overall tax and legal environment for the development of private equity, the worst from all the European countries.

Figure 2.6: Fundraising & investment in the Czech Republic



Source: EVCA yearbook 2012, BVK Special Private Equity in Europa 2002-2006.
Amounts in thousands of €

2.3.2 Hungary

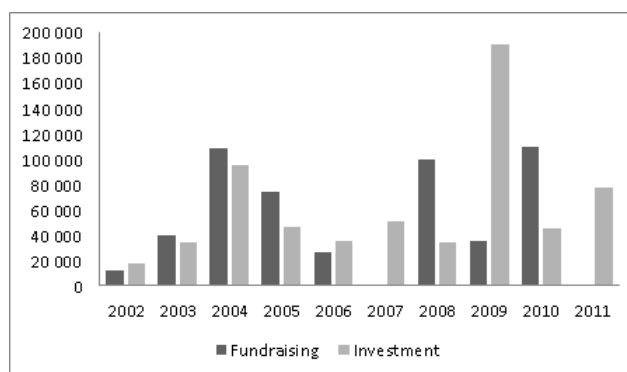
Hungary used to be the leader of private equity market in CEE. The first funds emerging were regional funds and funds that specialised in investment only in Hungary. These funds were the major suppliers of capital into the country. The first PE investments occurred in Hungary in 1993 after the short delay caused by preparations after the change of political regime. The investments grew and peaked in 1997. In 1998 the investments dropped sharply as a result of the Russian crisis and the uncertainty over new government. The growth of PE industry in Hungary started in the second half of 1990s, when the Hungarian market became a preferred area for the foreign investors and during this time the local PE market was one of the strongest in CEE region. The accession to EU started new chapter of Hungarian PE. The amounts of funds raised and volumes invested grew tremendously. The years 2005-2008 were the golden years of Hungarian PE industry. In 2009 a significant drop in PE activity came as a result of the crisis that came to the CEE region with short delay.

The government was important in the development of PE industry in Hungary. There were two periods when the government strongly supported PE industry. The first was in the years 2004 and 2005, when the supply of resources derived from the Hungarian state budget largely increased. This helped to strengthen the confidence of foreign investors and the volume of capital raised in Hungary quadrupled and the share of global funds grew from almost zero interest to €460 million. The Hungarian government used the state resources again in 2010, when Jeremie funds were set up⁴. These funds were financed jointly by the

⁴Jeremie funds were part of JEREMIE program (Joint European Resources for Micro to Medium Enterprises) combining EU resources with private funds. The PE fund managers

government and the private sector investors and the public sector contributed more than one-fifth of all states resources. Jeremie funds during their first year reached the similar proportion of investments as the private sector investors.

Figure 2.7: Fundraising & investment in Hungary



Source: EVCA yearbook 2012, BVK Special Private Equity in Europa 2002-2006.
Amounts in thousands of €

According to Karsai (2012), the proportion of domestic institutional investors compared to other CEE countries was extremely low. This was caused by a gap in the legislation of the domestic capital market. In 2006 this problem was solved by change in legislation and the Hungarian pension funds were allowed to invest up to 5 percent of their assets in funds registered as private equity funds in Hungary or in foreign country.

As it was said the Hungarian PE market was the leader in the CEE region. Since the mistakes in economic policy, exhaustion of privatization opportunities, high level of indebtedness and the relatively small size of market, the potential investors were less willing to commit their capital to Hungary and the regional significance of the Hungarian PE market is gradually declining.

2.3.3 Poland

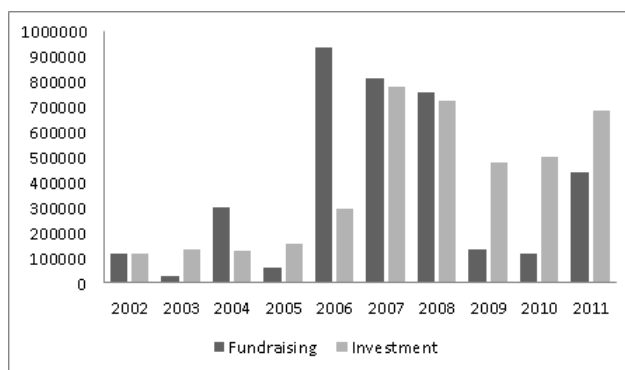
Polish PE market is one of the strongest in the CEE region and also one of the most developed among all emerging markets. According to Klonowski (2011) the development of PE in Poland can be divided into four stages: development phase, expansion, stagnation and buy-out.

The first phase (1990-1994) was the founding period of PE in Poland. The first

that received the capital JEREMIE program at the end of 2009 had to invest it until 2013. There were eight Jeremie funds in Hungary and they focused on financing innovative, small start-up companies.

PE firms that came to Poland were Enterprise investors, Innova Capital and Advent International (Klonowski 2011). The main providers of capital were IFC, the EBRD and foreign government agencies. In this development period the competition among PE firms was low and the deals executed had strong exits and good returns. The average deal size was \$4.1 million. In this stage the deals were driven by privatization and start-up investments (Klonowski 2005). The main investments focused on basic services(34%), manufacturing(25%) and food processing(24%). During the second phase (1995-1998) the PE market grew rapidly and many foreign PE companies came to Poland and raised new funds here. The new entrants were Baring Communications, Riverside Capital, Argus Capital, Oresa Ventures, Bancroft and others (Klonowski 2011). This period was driven by transfer deals, consolidation deals and regional expansion deals. Compared to the first phase, the competition for deals was higher. The average size of deals grew to \$5.4 million. The third stage (1999-2004) was the period of stagnation, number of deals went bankrupt or to liquidation. Some funds were not able to raise new funds due to poor results of the previous fund. Many PE firms were liquidated or were sold off. According to Klonowski (2011), the period (2005-2009) was the buy-out phase during which PE experienced massive boom and the main transaction were leveraged buy-outs. The amount of fundraising in 2006 climbed to €937 million. Investments peaked in 2007 with €781 million. The period from 2009 until now can be named as post-crisis phase during which the PE suffered large downturn. However, both investment and fundraising grew again in 2011. The reason why private equity in Poland coped with crisis so well is that Poland did not go through recession; and the growth of GDP only slowed down.

Figure 2.8: Fundraising & investment in Poland



Source: EVCA yearbook 2012, BVK Special Private Equity in Europa 2002-2006.
Amounts in thousands of €

Chapter 3

Theory

3.1 Fundraising

Fundraising is the initial phase of the whole private equity cycle. It is essential for the later stages and it determines the possibilities of fund managers in terms of how much they can invest and how large deals they can close. Fundraising is a process during which the PE company sells its business plan or idea to investors. It is accompanied by large information asymmetry between investors and the private equity company and it is a typical example of a principal-agent relationship. Since private equity funds are closed-ended, investors may decide to commit their capital only in the beginning of the funds life-cycle. Thus investors can not decide according to the results of the fund during its life-cycle. They may rely only on past reputation of fund managers, proposed business plan and other determinants before they commit their capital to the fund for ten to twelve years. Not only is fundraising process of collecting money but it also involves creation of relationships between fund managers and investors. Therefore, fundraising in emerging markets¹ where the private equity industry is new and fund managers do not have any track record is different from countries where fund managers have longer track record and thus have more information to decide upon. As a result, fundraising follows different patterns in different countries and therefore it limits us to find relevant conclusions when we want to identify the key determinants affecting fundraising.

Placement agent is involved in fundraising and he helps with establishing relationships between fund managers and potential investors. Expertise is essential

¹CEE is viewed as emerging however it emerges and some investors already consider it as emerged market

for attracting large potential investors and quickly and effectively run the whole process of fundraising. In case of success, the placement agents are paid large fee that equals to 2% of capital raised.

According to Balboa & Martí (2003) that build on microeconomic arguments, the cut-off point between supply-fundraising and demand-investment determines the quantity of PE capital in the economy. Supply is determined by the desire of investors to allocate their funds to this activity and demand is determined by the number of companies looking for this type of finance. These authors distinguish between short term supply curve and long term supply curve. The short term supply is fixed and it is vertical because PE industry does react slowly to change in demand and the process of fundraising is as long as 12 to 18 months. Balboa & Martí (2003) state that an increase in demand causes an increase in supply of private equity capital and that once supply reacts to the shift in demand, it does so in an excessive manner and therefore it increases the imbalances in the market. This excessive shift may be explained in two ways. The first is that investors and PE firms may believe that the increase in investment opportunities is larger than it really is and the second explanation may be that the PE firms may not properly analyse the costly adjustments connected with the growth of their own investment. According to Martí & Balboa (2001) the main determinants driving fundraising are factors directly related to the private equity process. These authors build on hypotheses that investment and divestment are the key factors that explain the new funds raised. This approach is important in countries where there is little information on final returns of past PE investments and where the fund managers and private equity companies lack reputation. The problem of lacking reputation was an issue in the beginning of private equity activity in CEE where new fund managers had to convince investors without having any reputation gained in PE industry.

The investors of private equity funds are banks, pension funds, sovereign wealth funds, fund of funds, insurance companies, government agencies, private individuals, capital markets and other asset managers.

3.2 Investment

This is the second stage in the private equity cycle and it is the core of private equity business. Two sides are involved here; the supply side is the private equity firm and the demand side are companies looking for PE financing. The

investment process starts by PE fund looking for and analysing market for potential investment. When company looking for PE financing is found, the evaluating of investment opportunity starts. Private equity company makes its own analysis and proposes to the investee company the scope of funds investment, indicative price and other conditions. When this is agreed, main conditions and terms are proposed and Term-Sheet is signed. That is a preliminary agreement in form of an agreement on a future agreement, there are the basic business and legal conditions, including a time schedule for the transaction. After that the process of due diligence starts. This phase helps the investor to set the final price and it contributes to the protection of the investor's capital. When due diligence ends without finding any complications, the final price and conditions are offered by PE company. If this is accepted, the final contract is signed.

Investment is the second stage in the PE cycle thus the main determinant of the size of future investment is the amount raised. Moreover, the investment is influenced by many macroeconomic factors similarly as fundraising. Authors Jeng & Wells (2000) aimed to assess determinants of PE investment and they focused on IPO, GDP and market capitalization growth, labor market rigidities, accounting standards, private pension funds and government programs. Their conclusion is that the main driver of investment is IPO and market capitalization growth is not significant. This conclusion was supported by Bonini & Alkan (2009) finding IPO to be significant factor in explaining the cross country variations in level of investment. On the other hand Gompers & Lerner (1999) state that IPO is not significant in determining the level of PE investment and that GDP growth positively influences the investment. Contrary to that, Jeng & Wells (2000) do not consider GDP growth to be significant for PE investments. Investment is also influenced by legal setting of the country, which is supported by Cumming *et al.* (2010) concluding that differences in legality have a significant impact on investments and their governance. The quality of the entrepreneurial environment is according to Bonini & Alkan (2009) positively correlated with PE investment. These authors also conclude that positive socioeconomic and investment environment have a strong and positive effect on the inception and development of PE investment activity.

Investment into risk capital is classified according to the target company's life cycle phase. The venture capital investments are based on participating in the initial life cycle phase which consists of:

- Seed financing: Financing taking part in experimentation phase and research of the product/service, assess and develop an initial concept before business has reached the start-up phase. The failure risk is very high.
- Start-up financing: Financing the production activity even if the commercial success of the product/service is not known yet. The finance is used for product development and marketing. The level of risk is high.
- Early stage financing: Financing to a company that has completed the product development stage and production is running, but the commercial validity of the product/service must still be evaluated. High financial contributions and lower risks.

The private equity investments are based on participating in the latter life cycle phases of company:

- Growth: Financing in relatively mature or developed companies that are looking for capital to expand or restructure operations, enter new market or finance acquisition.
- Rescue/Turnaround: Financing available for an existing business that has experienced trading difficulties and has a view to re-establish prosperity. This type of financing is usually done by specialized funds.
- Replacement capital/Secondary purchase: Purchase of minority stake of existing shares in a company from another investor, PE firm or shareholders.
- Buy-out: Financing provided to permit current operating management and investors to acquire existing product lines or business. We further divide this to management buy-in, management buy-out and leveraged buy-out.

Investment period usually lasts for first three to five years and during this phase all capital of the fund is invested. Investments are made according to the predefined business plan of the fund. If the fund is a buy-out fund, the fund managers do not invest in any companies in different stage of its life cycle.

Chapter 4

Data

4.1 Data

Gathering data about PE is a difficult task since the resources are very limited. The literature covering fundraising and investment activities in PE industry is scarce and the only publicly available data are available from EVCA yearbooks and special reports. The author tried to collect data by sending questionnaire to a large number of PE firms in Europe but only few responses came back. Therefore this paper is based primarily on data from EVCA (2012).

Not only accessibility of the data but also its reliability is an issue for research on the PE industry. Private equity companies are reluctant to provide any data from their business and the data in EVCA yearbooks are aggregated for each country. If we take the volumes divested or invested we can see in many publications about PE that information about final selling price or purchasing price is missing. Moreover the data collected by EVCA are based on voluntary data disclosure of investors that are members of EVCA and its correctness and completeness are difficult to control. Therefore the question of reliability of the data in EVCA publications may arise. Since no other freely accessible data are available and paid PE databases like PERQUIN and Emergin Markets Private Equity Association (EMPEA) after our request did not share any data hence we have to rely only on the data from EVCA and keep in mind that the data are only annual aggregated data for each country.

This work is based on two datasets, one for the CEE countries, the other for Western Europe countries. Both datasets consists of annual data running from 2002 to 2011. The dataset for CEE covers Czech Republic, Hungary and Poland and the dataset for Western Europe covers Germany, Sweden and United King-

dom. These countries are the leaders on PE market in both regions therefore we chose them to be the representative countries for our research. Poland is the leader of PE industry in the CEE region with the largest amounts raised and invested. Hungary used to be the strongest CEE private equity market in the end of 1990s but in the beginning of the last decade Poland grew more and became the leader. Czech PE market is the third strongest in the region. In Western Europe the private equity giant is the UK. German and Swedish PE markets are the most active PE behind the UK.

The period from 2002 to 2011 was chosen since there are no data available for 2012 and the data earlier than 2002 were not solid. All the data are expressed in Euro.

To homogenize the data directly related to private equity cycle each variable was normalized by the country's GDP in particular year. This adjustment is made for three reasons. First, we avoid the problem of heteroskedasticity; otherwise it may occur due to different economic growths of countries. Second, it eliminates the effect of different inflations among countries that could bias our estimated parameters. The third reason is that normalizing our data by GDP we reduce the large differences that occur in absolute values among countries. The aim of this paper is to determine the differences between determinants of fundraising in CEE and Western Europe and the differences between determinants of investment in CEE and Western Europe. Therefore, we run four regressions. Two with the volume of fundraising as the dependent variable on dataset from CEE and Western Europe and then two with the amount invested as the dependent variable again on datasets from CEE and Western Europe.

To find common determinants and to make our comparison more obvious and easily comparable we use the same explanatory variables for all four regressions. The variables were chosen based on literature talking about PE fundraising and investment. The main inspiration came from Balboa & Martí (2003), Bernoth *et al.* (2010), Balboa & Martí (2009), Jeng & Wells (2000), Martí & Balboa (2001) and Gompers & Lerner (1999). The existing literature focusing on fundraising and investment determinants can be divided among papers that focus on macro determinants, papers that focus on micro determinants and among papers that focus on determinants directly related to the PE cycle. The work from Balboa & Martí (2003) is based on microeconomic arguments although they use also macro determinants in their regressions. The work of Bernoth *et al.* (2010) is based only on macro determinants affecting investment as opposed to Martí & Balboa (2001) that tries to explain the fundraising by

means of variables related to the private equity process. There are other authors and literature as well but the mentioned ones focus their research on Europe and their publications are recent.

4.1.1 Data on fundraising

Fundraising in Western Europe and CEE differs in few aspects. The first and most obvious is the total volume of capital raised. In the years 2002-2011 the total volume of capital raised in all CEE countries in one year is on average only 2.36% of the total volume of capital raised in Europe (Karsai 2009). The total amount of funds raised in the whole Europe in 2011 was almost €40 billion and in CEE it was only €941 million.

Second is the share of domestic and non-domestic investors of PE funds. In Central and Eastern Europe the domestic investors account, on average, for 12,8 percent of total compared to Western Europe countries where the share of domestic investors was oscillating around 37% of total. There are three possible explanations.

The first is the regulation of pension funds, government agencies, banks and other institutions in each country. If these main investors are not allowed to allocate their capital into PE funds then the domestic investors consists of other investors with less capital. According to Karsai (2012) the availability of capital depends on institutional savings in the private sector and mainly those of pension funds. The local institutional investors are important in fundraising since they have better knowledge of the features and the country's current position on the market. The second reason may be the historical issues. In Western Europe the free market economy has a long tradition. Investors and institutions have knowledge about private equity industry and they are not afraid of investing into it. In CEE the PE industry is relatively young and many entrepreneurs may have no or just little information about possibilities that private equity financing offers and institutions may prefer to allocate their capital into less risky and better known vehicles. Lastly domestic investors from CEE prefer to invest and allocate their capital outside CEE. There is no literature examining these differences in share of domestic investors and further research is needed. It is an important topic since it may change significantly the PE industry in CEE and help it grow and develop.

The funds in CEE are mostly regional, very rarely focused on one country only.

Therefore the amounts raised are aggregated.

The investors of private equity funds are banks, pension funds, sovereign wealth funds, fund of funds, insurance companies, government agencies, private individuals, capital markets and other asset managers. We can compare the differences in sources of capital for PE between CEE and Western Europe on graphs B.3 and B.4. The main and traditional investors of private equity funds are pension funds, banks and fund of funds. In Western Europe the share of the traditional investors is large, in CEE the share of the traditional investors is smaller. The composition of investors in Western Europe is more balanced than in CEE. The large share of government agencies in CEE in years 2009 and 2010 was mainly due to commitments from JEREMIE funds.

4.1.2 Data on investment

The data in EVCA dataset are aggregated via two methods, industry statistics and market statistics. Industry statistics is an aggregation of the figures according to the country of location of the private equity firms office, which is in charge of the deal. At the European level, this concerns investments made by European private equity firms regardless of the location of the target company. Market statistics is an aggregation of the figures according to the location of the portfolio company. At the European level, this relates to investments in European companies regardless of the location of the private equity firm. In our research, we are working in our research with data that are from industry statistic since the fundraising data are available only as industry statistics.

In the years 2002-2011 the total volume of investment in all CEE countries in one year is on average only 3.3% of the total volume of capital invested in Europe(Karsai 2009). The total amount of investment in the whole Europe was €45.5 billion in 2011 and in CEE it was only €1.244 billion.

Chapter 5

Models & methodology

Since we have two datasets and we want to describe two different dependent variables we have four different regressions. We use panel data methodology to control for individual heterogeneity of the countries. Both our datasets are balanced panels. For easier comparison of our results we use the same explanatory variables for all four models. This enables us to find out which determinants affect the amounts of funds raised in CEE and Western Europe and also which determinants affect investments made in CEE and Western Europe. We can include explanatory variables that are robust to the inclusion or omission of other regressors. As it was already mentioned, we will run four regressions where two will be with the dependent variable being the amount of funds raised normalized by GDP and the other two will be with the dependent variable being the amount invested normalized by GDP.

The explanatory variables in our models are defined as follows:

- Gross domestic product growth (GDPgr) - Annual growth rate of GDP in percent. Source: Eurostat
- Interest rates (IR) - ten-year government bond yields in percent. Source: OECD
- Market capitalisation (MCAP) - market capitalisation of listed companies as a percentage of GDP. Source: World Development Indicators
- Research and development (RnD) - research and development expenditures as percentage of GDP. Source: World Development Indicators
- Stock market return (SMR) - annual change in All Share Price Index. Source: OECD

- Divestment (Div) - total volume divested normalized by GDP. Source: EVCA
- Investment (Inv) - total volume invested normalized by GDP. Source: EVCA

We use not only macro determinants but also determinants that are related to the PE process itself. The variables Fr, Div and Inv are all in aggregate terms since they represent the amounts raised, divested and invested by all private equity organizations in the country.

It is important to analyze the impact that GDP growth has on the volumes of investment and amounts raised. When the GDP growth is positive and the economy grows, we can expect investors to be willing to commit their capital to private equity. Moreover, good investment opportunities for PE funds can occur. The long term interest rate is included as it represents the alternative to investments to private equity Gompers & Lerner (1999). If the interest rate increases we may expect the volume of funds raised to decrease. Therefore, when the interest rate increases the volume of investments should decrease. Hence we expect the coefficient of IR to be negative in all our regressions.

We include market capitalisation that is, according to Balboa & Martí (2009), a proxy to degree of development of the capital markets which is essential for the development of PE market and may be viewed as a general reference of liquidity. If the size of capital market is large, it creates favourable environment for investment and the possibility for fund managers to exit investment (Jeng & Wells 2000). Thus it is the positive sign for PE investors and we expect to have a positive coefficient of MCAP. Another independent variable incorporated is research and development as a percentage of GDP which may influence investors when deciding where to commit their capital. Moreover in countries with higher RnD expenditure investment opportunities for PE funds are better. Stock market return is included as it is expected to positively influence volume of funds raised. It is a proxy of positive economic environment and thus it may positively influence the amounts invested (Balboa & Martí 2003). On the other hand, stock market return may be also viewed as an alternative asset to private equity (Balboa & Martí 2009).

The three variables that are related directly to the private equity process are Div, Fr and Inv. The amount divested is incorporated since the higher the volume of successful divestment is, the higher expected returns on investments are. Therefore the investors will be willing to commit their capital. Since in-

vestment is expected to be larger in countries with higher volume of successful divestment we expect the coefficient of *Div* to be positive in all our regressions. In our regressions we are going to use panel data methodology. Panel data sets are most useful when controlling for time-constant unobserved features which we think might be correlated with the explanatory variables in our model (Wooldridge 2009). It allows us to control for the effects of variables that specially affect the dependent variable of each country despite being unobservable. Moreover, panel data methodology allows us to increase the degree of freedom of the tests and it reduces collinearity among the explanatory variables.

We will consider two methods to estimate our unobserved effects panel data models - fixed effect estimation and random effect estimation.

Fixed effect estimation is an alternative method to the first differencing method. We want to get rid of fixed effect since we think it is correlated with the explanatory variables. In the fixed effect approach we will get time-demeaned data and the fixed effect disappears so we can use pooled OLS.

Random effect estimation is different from fixed effect approach as we suppose that fixed effect and explanatory variables are not correlated in all periods. In this case, fixed effect and first differencing are inefficient. To decide if we will use random effects estimation or fixed effects estimation, we will use Hausman test for all four regressions. The null hypothesis of the test states that the fixed effect is correlated with explanatory variables. Although both fixed effect estimation and random effect estimation are consistent under the null, the random effect estimation is asymptotically more efficient. Based on the results of Hausman test we are going to use random effect estimation for all our models. Prior to estimation we also need to check the collinearity among explanatory variables. We may conclude that multicollinearity is not present.

At first we will focus on model where the dependent variable will be the amount of funds raised normalized by GDP.

$$Fr_{it} = \beta_0 + \beta_1 GDPgr_{it} + \beta_2 IR_{it} + \beta_3 SMR_{it} + \beta_4 RnD_{it} + \beta_5 MCAP_{it} + \beta_6 Inv_{it} + \beta_7 Div_{it}$$

Then we will proceed with the model where the dependent variable is the amount invested normalized by GDP.

$$Inv_{it} = \beta_0 + \beta_1 GDPgr_{it} + \beta_2 IR_{it} + \beta_3 SMR_{it} + \beta_4 RnD_{it} + \beta_5 MCAP_{it} + \beta_6 Div_{it}$$

Chapter 6

Results

6.1 Overall results

The aim of this work is to determine the common determinants of fundraising and investment in Western Europe and CEE. From the results of our four regressions, we can conclude that the main and strongest determinants of fundraising and investment are determinants directly related to the private equity cycle. Market capitalisation is the most important macroeconomic determinant.

In models where the dependent variable is fundraising, the most important determinant is investment which is followed by divestment. Moreover, investment is the only significant variable in model based on CEE data and this strongly supports the findings of Martí & Balboa (2001) where they state that in countries where there is scarce and asymmetric information about final PE returns and fund managers have no or just small reputation, the main drivers of private equity fundraising are variables directly related to PE cycle. In Western Europe fundraising is determined by investment, divestment, research and development spending and market capitalisation.

In models where the dependent variable is investment the main determinant is market capitalisation followed by divestment. In CEE the investment is according to our result determined by stock market return, research and development spending and market capitalisation. In Western Europe the investment is determined by market capitalisation and fundraising. Hence the common determinant of investment is market capitalisation. We expected that the common and strongest determinant will be divestment, however, divestment affects investments only in Western Europe. This may be caused by relatively volatile trend of divestments in CEE.

6.2 Results - Fundraising

Results of both regression where the dependent variable is total volume of funds raised normalized by GDP are shown in table A.1. According to the results of the Hausman test we used random effect generalized least square regressions robust to heteroskedasticity.

We can see that GDP growth is insignificant. This is not what we have expected but on the other hand it is in line with the conclusion of Balboa & Martí (2009). Interest rate as well as stock market returns that are variables that represent the return of alternative assets to private equity are not significant in CEE nor in Western Europe. This means that investors do not decide about investing into PE according to revenues from alternatives. Furthermore we can interpret this result in a way that investors do not consider stock market revenues and long term bonds as an alternative to PE. This may be also one of the reasons why institutional investors are willing to commit their capital to private equity. Moreover, this result is again in line with findings of Balboa & Martí (2009) and Balboa & Martí (2003).

Research and development is significant in Western Europe contrary to CEE where it is not. The sign of RnD is positive therefore the more is spent on research and development the more are investors willing to commit their capital to PE. Investors when deciding about committing their capital to PE take in account the spending on research and development in Western Europe but not in CEE. This may be caused by different types of deals in Western Europe and CEE. However, that was more significant in 1990s than in period we focus on. Market capitalisation is again significant only in Western Europe. Market capitalisation is a proxy of liquidity and the coefficient of MCAP is negative and this something we did not expect. It means that the more active and bigger the capital market is the less it is fundraised. However the coefficient of MCAP is very small compared to Inv or Div.

The two explanatory variables directly related to private equity process are variables with the biggest coefficients, hence they affect fundraising the most. Investment is a significant explanatory variable in both Western Europe and CEE. In CEE it is the only significant coefficient. This means that investment is the only variable affecting the decision of potential investors about fundraising in CEE. The value of both coefficients is much larger than the value of other significant coefficients therefore investment has important and significant impact on fundraising in both regions. This result confirms our expectations that

the more is invested, the larger is fundraising. According to Balboa & Martí (2003), the main drivers of fundraising are investments and divestment and our results supports this as well. The coefficient of *Inv* is the largest coefficient of the whole model.

Divestment is significant only in Western Europe. The coefficient of *Div* is 1.1857 which is large and combined with the coefficient of *Inv* it supports the hypothesis of Martí & Balboa (2001), which says that all the main drivers of fundraising in PE are the determinants directly related to PE process i.e. divestment and investment. The result is also in line with results of Balboa & Martí (2003), Jeng & Wells (2000) and Gompers & Lerner (1999).

The size of coefficients of *Inv* and *Div* tells us that investors positively value the deal flow and their decision about committing capital to private equity funds is largely based on the activity and results of PE industry.

According to our results, fundraising in Western Europe is affected by more determinants than in CEE. This may be caused by different stages of development of private equity industry in Western Europe and in CEE. The PE industry in Western Europe in the period we focus on was more mature and on a higher level of development. The PE industry in CEE in this period was already more developed than in 1990s but there was still a difference in the amount of deals and their size. The amounts raised differ a lot each year in CEE countries. This is due to lower demand for PE financing and less private equity companies. Therefore, there are years when no funds are raised and on the other hand there are years when more funds are raised and this results in significant differences.

We can see that there is more significance in our explanatory variables in the model based on the Western Europe dataset than in the model based on CEE. The value of R^2 in the model based on Western Europe dataset is 0.8026 which is very high and in the model based on CEE data is 0.4613.

6.3 Results - Investment

Results of both regressions where the dependent variable is total volume invested normalized by GDP are shown in table A.1. We used random effect generalized least square regression robust to heteroskedasticity based on the results of the Hausman test. As in the regression with *Fr* as dependent variable, the R^2 is much higher in the model that is based on data from Western

Europe countries. The R^2 from the model based on CEE data is 0.5455 and this is a reasonably good result. The R^2 from the model based on Western Europe data is 0.7186, which is high. We will discuss the values of R^2 later.

The growth of GDP and the interest rate are insignificant in both models. The GDP growth is not affecting the decision of investors to invest and this confirms the findings of Jeng & Wells (2000). However, the findings of Bernoth *et al.* (2010) show that GDP growth is insignificant in CEE but in Western Europe GDP growth affects positively investment.

Interest rate is not significant and it does not affect investments in Western Europe nor in CEE. This supports the findings of Balboa & Martí (2009) as well as findings of Bernoth *et al.* (2010). We take the interest rate (long-term government bonds) as an alternative asset to investment in PE funds and the results of models describing fundraising showed that IR is insignificant. The fact that IR is insignificant here as well only confirms the results from fundraising.

The stock market return is significant only in the model based on CEE data. The coefficient has a negative value which means that the higher returns from the stock market are the less is invested. Stock market return may be viewed as a proxy of economic environment and from this point of view we would not expect to have a negative coefficient. If we take SMR as an alternative asset to PE we expect to have a negative sign here.

Research and development is significant only in the regression based on the CEE dataset. The coefficient of RnD is negative which is something we did not expect. We expected to get a positive significant coefficient for both regressions. This result tells us that the more money is devoted to research and development the less is invested in the CEE region.

Market capitalisation is significant in both regions. It shows us that in both regions the liquidity and the development of markets positively affects investment. This confirms the findings of Bernoth *et al.* (2010) and Gompers & Lerner (1999). A strong and active equity market creates a favourable environment for investors and it gives the PE investors the potential of exit strategy. The last determinant of our model is again a variable directly related to private equity process, divestment normalized by GDP. Divestment is significant only in the model based on Western Europe data. It tells us that liquidity is an important determinant for investors when deciding about committing their capital to PE funds. The coefficient of Div is positive and it is the largest co-

efficient, therefore divestment strongly affects investment in Western Europe. This supports the findings of Balboa & Martí (2009). We expected that divestment would be significant with a large coefficient in both regressions, however in model based on data from CEE divestment is not significant.

6.4 Discussion - Values of R^2

Now let us discuss the values of the R^2 in our regressions. We talk about *overall* R^2 as it corresponds to the normal OLS R^2 . Since the values of *overall* R^2 are not very close to the values of *within* R^2 , the individual heterogeneity is not low in our models and we could not use pooled OLS estimation and the use of random effect estimation was appropriate. We can see that both models based on data from Western Europe have a large value of R^2 . In the model where the dependent variable is Fr the R^2 is 0.8026 and in the model where the dependent variable is Inv the R^2 is 0.7186. Compared to the models based on data from CEE where the R^2 is 0.4613 respectively 0.4413. This difference may be caused by the volatile trend of fundraising, investment and divestment in CEE. If we compare these data from CEE with data from Western Europe we can see that in Western Europe we may talk about trends when describing these data, however the data from CEE do not follow trends and they look more random. According to ? overall fundraising and investment in the CEE region remains subject to significant annual swings. This may be the reason why there are differences in R^2 between regressions based on data from CEE and from Western Europe.

Chapter 7

Conclusion

Unlike the previous literature on this topic, our main focus was to look for the differences in determinants of fundraising and investment between CEE and Western Europe. Previous literature covering these determinants compares them between CEE countries and Western Europe countries, but there is no work that would try to find common determinants for fundraising and investment and compare them between CEE and Western Europe.

Private equity industry in the last decade experienced boom and recession and today it is in the phase of returning back to its previous activity. In Western Europe the PE industry is recovering successfully on the contrary to the PE industry in CEE which is struggling to recover to previous numbers. Therefore, it is interesting to search for common determinants of fundraising and investment in both regions as well as find the differences.

Our research is based on two datasets consisting of three countries each. The CEE dataset consists data of the Czech Republic, Hungary and Poland. The Western Europe dataset consists data of the Germany, Sweden and the UK. We chose these countries to be representative of the regions since their PE industry is the largest and most active in the regions. We use data from 2002-2011, the latest data available for private equity research.

The paper describes the cycle of private equity, gives us theoretical background for fundraising process and investment process and presents us with a short history of private equity industry in each country. Moreover, it talks about data about private equity that are very limited and only aggregated data are available. This makes the research in the field of private equity difficult.

Our results show that the main determinants of fundraising and investment are determinants directly related to the private equity cycle. The second main determinant is the market capitalisation.

Fundraising is mainly determined by investment followed by divestment. Investment in our regression based on CEE data is the only significant variable which may be a consequence of the strong volatility of fundraising in CEE countries. Fundraising in Western Europe is according to our findings determined by investment, divestment, market capitalisation and research and development spending.

Investment in Western Europe is strongly affected by divestment and market capitalisation, therefore the determinants for investment and fundraising in Western Europe are very similar. In CEE countries investment is determined by market capitalisation, research and development spending and stock market returns. Contrary to our expectations it is not determined by divestment. Thus the determinants of fundraising and investment in Western Europe countries are different.

If we compare our results with previous literature covering the determinants of fundraising and investment, we may conclude that our results are generally in line with previous literature.

Bibliography

- BALBOA, M. & J. MARTÍ (2003): “An integrative approach to the determinants of private equity fundraising.” In “EFMA 2004 Basel Meetings Paper,” .
- BALBOA, M. & J. MARTÍ (2009): “The double market approach in venture capital and private equity activity: The case of europe.”
- BARNES, S. & V. MENZIES (2005): “Investment into venture capital funds in europe: An exploratory study.” *Venture Capital* **7(3)**: pp. 209–226.
- BERNETH, K., R. COLAVECCHIO, & M. SASS (2010): “Drivers of private equity investment in cee and western european countries.” .
- BONINI, S. & S. ALKAN (2009): “The macro and political determinants of venture capital investments around the world.” *Available at SSRN 945312* .
- CASELLI, S. (2010): *Private equity and venture capital in Europe markets, techniques, and deals*. Amsterdam: Academic Press.
- CUMMING, D., D. SCHMIDT, & U. WALZ (2010): “Legality and venture capital governance around the world.” *Journal of Business Venturing* **25(1)**: pp. 54–72.
- DOMINGUEZ, J. R. (1974): *Venture capital*. Lexington Books Lexington, MA.
- DUBOCAGE, E. & D. RIVAUD-DANSET (2004): “The development of venture capital in europe, the role of public policy.” *Capital Market Development and the Economy, Tokyo Club Papers* **16**: pp. 76–117.
- EVCA (2008): *Benchmarking European Tax and Legal Environments*. EVCA.
- EVCA (2012): *EVCA Yearbook 2012: Pan-european Private Equity & Venture Capital Activity Report*. EVCA.

- GOMPERS, P. A. & J. LERNER (1999): “What drives venture capital fundraising?” *Technical report*, National Bureau of Economic Research.
- GROH, A., H. LIECHTENSTEIN, & K. LIESER (2008): “The attractiveness of central eastern european countries for venture capital and private equity investors.” .
- JENG, L. A. & P. C. WELLS (2000): “The determinants of venture capital funding: evidence across countries.” *Journal of corporate Finance* **6(3)**: pp. 241–289.
- JOWETT, P. & F. JOWETT (2011): *Private Equity: The German Experience*. Palgrave Macmillan.
- KARAOMERLIOGLU, D. C. & S. JACOBSSON (2000): “The swedish venture capital industry: an infant, adolescent or grown-up?” *Venture Capital: an international journal of entrepreneurial finance* **2(1)**: pp. 61–88.
- KARSAI, J. (2009): “The end of the golden age-the developments of the venture capital and private equity industry in central and eastern europe.” *IEHAS Discussion Papers* **901**.
- KARSAI, J. (2012): “Development of the hungarian venture capital and private equity industry over the past two decades.” *Discussion Papers, MT-DP* **1**.
- KLONOWSKI, D. (2005): “The evolution of the venture capital industry in transition economies: the case of poland.” *Post-Communist Economies* **17(3)**: pp. 331–348.
- KLONOWSKI, D. (2006): “Venture capital as a method of financing enterprise development in central and eastern europe.” *International Journal of Emerging Markets* **1(2)**: pp. 165–175.
- KLONOWSKI, D. (2011): “Private equity in poland after two decades of development: evolution, industry drivers, and returns.” *Venture Capital* **13(4)**: pp. 295–311.
- MARTÍ, J. & M. BALBOA (2001): “Determinants of private equity fundraising in western europe.” *Working papers= Documentos de trabajo: Serie AD* **(15)**: p. 1.

- MORGAN, G. (2009): "Private equity in the uk context." *Transfer: European review of labour and research* **15(2)**: pp. 209–227.
- RAJCHLOVÁ, J., M. BARANYKOVÁ, M. POLÁK, & Z. BROŽ (2011): "Private equity and venture capital financing in the czech republic and other european countries - developments, opportunities and limitations." *Volume LIX, Mendel University* .
- SEDLÁKOVÁ, B. (2008): *Development of Private Equity Funds in the Czech Republic*. Ph.D. thesis, Charles University.
- TYKVOVÁ, T., M. BORELL, & A. KROENCKE (2012): "Potential of venture capital in the european union." *Newsletter, Policy Department Economic and Scientific Policy European Parliament* .
- WOOLDRIDGE, J. M. (2009): *Introductory econometrics: a modern approach*. South-Western Pub.

Appendix A

Tables

Table A.1: Regression results

Independent variables	Dependent variables			
	Fundraising		Investment	
	CEE	Western Europe	CEE	Western Europe
GDPgr	.0000864	-.0004151	-.0000217	.0000773
IR	.0000364	.0018516	-.0000267	.0008501
SMR	.00000595	.0000106	-.0000136**	-.0000117
RnD	-.0004196	.0026533*	-.0010634**	.0000147
MCAP	-.0000209	-.0000709*	.0000343**	.0000572***
Inv	.5722215**	1.7879660***	–	–
Div	-.0781648	1.1857060*	-.0068794	.9562365***
Constant	.0002276	-.0137698	.001432	-.0044446
N	30	30	30	30
R^2	0.4613	0.8026	0.4413	0.7186
Hausman	.9754	1.0000	.9702	0.1962

Note: *Statistically significant at the 10% level;**Statistically significant at the 5% level;
***Statistically significant at the 1% level.

Table A.2: Correlation table - CEE

	GDPgr	IR	SMR	RnD	MCAP	Inv	Div
GDPgr	1.00						
IR	-0.39	1.00					
SMR	0.57	-0.17	1.00				
RnD	-0.19	-0.49	-0.13	1.00			
MCAP	0.37	-0.21	0.49	-0.14	1.00		
Inv	-0.08	0.21	-0.24	-0.46	0.25	1.00	
Div	-0.11	0.27	-0.15	-0.08	-0.22	0.01	1.00

Table A.3: Correlation table - Western Europe

	GDPgr	IR	SMR	RnD	MCAP	Inv	Div
GDPgr	1.00						
IR	0.04	1.00					
SMR	0.64	-0.31	1.00				
RnD	0.11	-0.35	0.07	1.00			
MCAP	0.28	0.18	0.35	-0.22	1.00		
Inv	0.29	0.25	0.24	-0.26	0.76	1.00	
Div	0.32	0.07	0.31	-0.27	0.66	0.76	1.00

Table A.4: Estimation results CEE - Fundraising

```

Random-effects GLS regression           Number of obs   =       30
Group variable: country1              Number of groups =        3

R-sq:  within = 0.3117                 Obs per group:  min =       10
      between = 0.9972                   avg =          10.0
      overall = 0.4613                   max =          10

corr(u_i, X) = 0 (assumed)             Wald chi2(7)    =       18.84
                                          Prob > chi2     =       0.0087

```

Fr	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
GDPgr	.0000864	.0000694	1.25	0.213	-.0000496	.0002223
IR	.0000364	.0001351	0.27	0.788	-.0002284	.0003012
SMR	5.95e-06	8.10e-06	0.73	0.463	-9.93e-06	.0000218
RnD	-.0004196	.0006029	-0.70	0.486	-.0016013	.000762
MCAP	-2.09e-06	.0000203	-0.10	0.918	-.0000418	.0000376
Inv	.5722215	.2547133	2.25	0.025	.0729927	1.07145
Div	-.0781648	.1091319	-0.72	0.474	-.2920593	.1357297
_cons	.0002276	.0015188	0.15	0.881	-.0027493	.0032044
sigma_u	0					
sigma_e	.00079449					
rho	0	(fraction of variance due to u_i)				

Table A.5: Estimation results Western Europe - Fundraising

```

Random-effects GLS regression           Number of obs   =       30
Group variable: CountryW1              Number of groups =        3

R-sq:  within = 0.6999                  Obs per group:  min =       10
        between = 1.0000                  avg =          10.0
        overall = 0.8026                  max =          10

                                           Wald chi2(7)    =       89.45
corr(u_i, X) = 0 (assumed)              Prob > chi2     =       0.0000

```

Fr	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
GDPgr	-.0004151	.0005223	-0.79	0.427	-.0014387	.0006085
IR	.0018516	.0017431	1.06	0.288	-.0015649	.0052681
SMR	.0000106	.0000785	0.13	0.893	-.0001432	.0001644
RnD	.0026533	.0015085	1.76	0.079	-.0003033	.0056099
MCAP	-.0000709	.00004	-1.77	0.076	-.0001493	7.50e-06
Inv	1.787966	.3567749	5.01	0.000	1.0887	2.487232
Div	1.185706	.65086	1.82	0.068	-.0899565	2.461368
_cons	-.0137698	.0090109	-1.53	0.126	-.031431	.0038913
sigma_u	0					
sigma_e	.00559238					
rho	0	(fraction of variance due to u_i)				

Table A.6: Estimation results CEE - Investment

Random-effects GLS regression	Number of obs	=	30
Group variable: country1	Number of groups	=	3
R-sq: within = 0.1960	Obs per group: min =		10
between = 0.9963	avg =		10.0
overall = 0.4413	max =		10
	Wald chi2(6)	=	18.16
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0058

Inv	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
GDPgr	-.0000217	.0000566	-0.38	0.701	-.0001327	.0000892
IR	-.0000267	.0001105	-0.24	0.809	-.0002431	.0001898
SMR	-.0000136	5.99e-06	-2.27	0.023	-.0000254	-1.88e-06
RnD	-.0010634	.0004409	-2.41	0.016	-.0019276	-.0001991
MCAP	.0000343	.000015	2.29	0.022	4.92e-06	.0000636
Div	-.0068794	.0893264	-0.08	0.939	-.1819561	.1681972
_cons	.001432	.001207	1.19	0.235	-.0009336	.0037976
sigma_u	0					
sigma_e	.00064845					
rho	0	(fraction of variance due to u_i)				

Table A.7: Estimation results Western Europe - Investment

```

Random-effects GLS regression           Number of obs   =       30
Group variable: CountryW1              Number of groups =        3

R-sq:  within = 0.3636                  Obs per group:  min =       10
      between = 1.0000                    avg =          10.0
      overall = 0.7186                    max =          10

                                           Wald chi2(6)    =       58.74
corr(u_i, X) = 0 (assumed)              Prob > chi2     =       0.0000

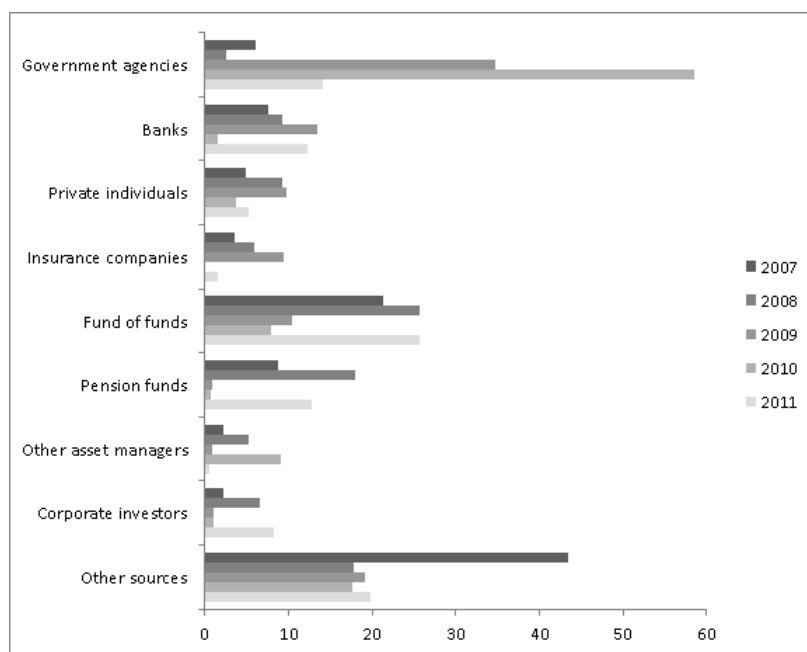
```

Inv	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
GDPgr	.0000773	.0003048	0.25	0.800	-.0005201	.0006747
IR	.0008501	.0010032	0.85	0.397	-.0011161	.0028164
SMR	-.0000117	.0000458	-0.26	0.799	-.0001015	.0000781
RnD	.0000147	.0008816	0.02	0.987	-.0017133	.0017426
MCAP	.0000572	.0000201	2.85	0.004	.0000178	.0000966
Div	.9562365	.3239455	2.95	0.003	.3213149	1.591158
_cons	-.0044446	.0051842	-0.86	0.391	-.0146054	.0057162
sigma_u	0					
sigma_e	.00282194					
rho	0	(fraction of variance due to u_i)				

Appendix B

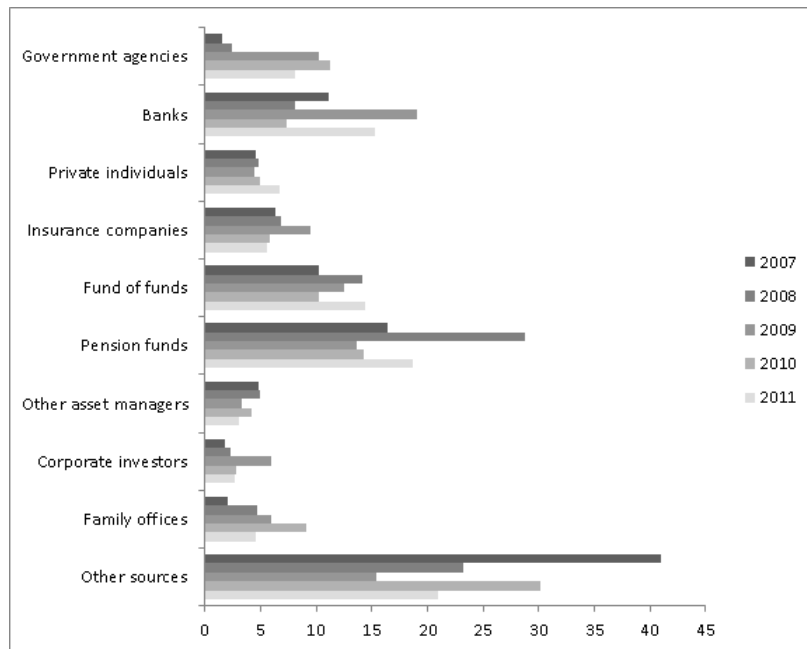
Figures

Figure B.1: Sources of capital raised for CEE



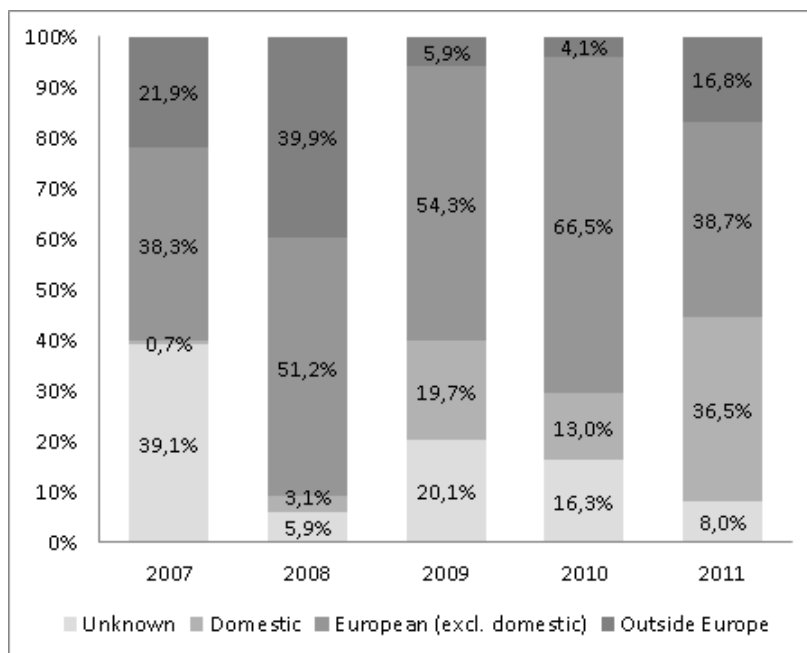
Source: EVCA Central and Eastern Europe Statistics 2011

Figure B.2: Sources of capital raised for Western Europe



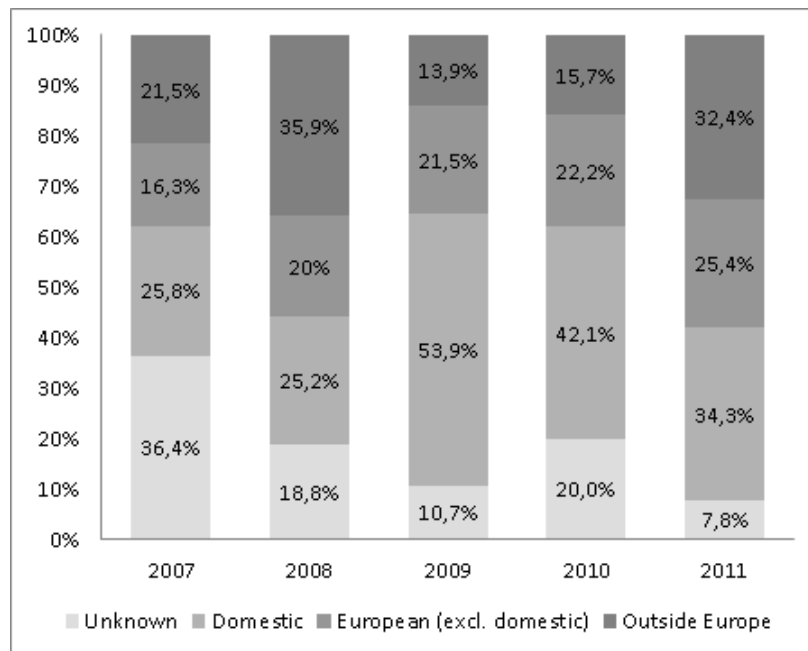
Source: EVCA Central and Eastern Europe Statistics 2011

Figure B.3: Geographic sources of capital raised for CEE



Source: EVCA yearbook 2012

Figure B.4: Geographic sources of capital raised for Western Europe



Source: EVCA yearbook 2012