ERASMUS UNIVERSITY ROTTERDAM
ERASMUS SCHOOL OF ECONOMICS
Bachelor Thesis Economics & Business
Specialization: Financial Economics

Private equity funds' performance across Europe

Attractiveness-based comparison

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Finish date: 16 July 2024

ABSTRACT

Central question of the paper is how the performance of the private equity funds in Europe is linked to the attractiveness of the country these European funds are established in. The relationship is studied during the period of 1989-2021 using the regression construction, predicting the net IRR and net multiple, testing for robustness of the outcome through time. The results showed that net IRR and net multiple are higher in more attractive countries for PE funds, with 2.20% and 0.13 difference in general regression, and 3.13% and 0.17 for the period of 2010-2021, respectively. Findings highlight the importance of the choice of country to register and operate private equity fund in, even more so, this importance have risen in recent period.

Keywords: Private equity, Europe, Performance, Financial development, Attractiveness

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CHAPTER 1 Introduction

Since 1976, when private equity was first shaped by Jerome Kohlberg, Henry Kravis and George Kohlberg, forming KKR, there has been a debate regarding the appropriateness of value creation that buyout process usually involved. This is how private equity started. Despite efficiency that this industry brought to the business world, the public still judges PE firms based on the social aspects it influences. As such, Bargenter (2023) summarises some of the negatives that need to be considered in the field of medical treatment. While the investment in healthcare business increased from 41.5 billion to 119.9 billion dollars in the US, the increased presence of PE in the business results in higher costs for consumers. Additionally, there is a widespread opinion that private equity firms result in many businesses being destroyed and jobs lost. Davis, Haltiwanger, Jarmin, Lerner, & Miranda (2011) find that in the study period of 1980-2005 gross job destruction relative to control group becomes 10 percent higher post buyout. Same study finds that 13.5 percentage point increase in job reallocation relative to control group is associated after 2 years post buyout, which leads to a conclusion that private equity firms result not simply in destruction of jobs, but it is being creative, therefore improving target firms' performance, although controversial.

According to McKinsey & Co. (2024), private equity industry's assets under management amounted to 13.1 trillion dollars as of June 30th, 2023, which hints at the significance that private equity firms have in shaping the economy and the world of entrepreneurship.

In addition, special report of Preqin of 2017 states that top 100 general partners (GPs) by size managed to raise 1.5 trillion dollars in a 10-year period, which showcases the prominence and power the industry has. Same report indicates that 64 out of 100 biggest GPs are located in United States, while only 24 in Europe (out of which 21 funds are operating from Western Europe). This raises the question whether the fact that Western (generally, more financially developed) countries in Europe perform better than their Eastern neighbours. Could it be that in countries where private equity firms are not so widespread perform better because of lower competition? Additionally, there is a general notion indicating that there is a positive correlation between the country's development and the complexity of its financial system, which implies prevalence of private equity funds in developed countries, as these countries will also have intricate financial system.

The aim of the research is, thus, to construct intercomparison of private equity funds within Europe, comparing the funds by groups of countries, divided by the attractiveness of private equity activity in these countries. Motivation to focus on European region arises from the fact that most of the past research takes either the worldwide scope or targets only US market, evidenced by some studies, such as paper by Tykvova (2017) and referenced Preqin report (2017).

Attempts to find papers that studied the question addressed in this paper did not yield any study with the research question addressing the differences in performance of private equity funds based on the country or European region, therefore combination of approaches in analysing private equity is utilized. This way of conducting the analysis fills the gap in the study of the relationship between how attractive the European country is and what performance results the funds established in the specific country show, quantifying this potential correlation.

To measure and compare the performance, the experience of previous studies is used, such as Harris, Jenkinson, and Kaplan (2014) and Manac, Martin, and Wood (2022), where net IRR and net multiple are utilised as a measure of PE fund performance indicators. Relevant data is being extracted form Preqin database throughout the whole research. In their turn, papers by Groh, von Liechtenstein, and Lieser (2010) and Bedu & Montalban (2013) provide useful insights into the indicators regarding country's attractiveness predictors. Combining the research question from mentioned papers would be interesting as to also compare country categories in regards to different funds' strategies. This approach was decided to being supported by the data on four performance indicators, namely, IRR, net multiple, distributed to paid-in ratio (DPI) and residual value to paid-in ratio (RVPI) for the European region, closed to investments, funds. Further, to quantify the difference in performance of funds in countries of different level of attractiveness, two groups, developed and developing, were established based on the number of funds registered and stock market capitalisation to GDP ratios. Influence of performance indicators mentioned (IRR, net multiple, DPI, RVPI) was modelled not only by country's attractiveness, but, in line with previous research, size, vintage year and fund strategy, forming regressions. All the data regarding PE funds was collected using the Preqin database, while supporting features derived mainly from OECD database, with regression results obtained using Stata statistical software.

Most important finding of the paper confirmed the expectation that the more financially developed the country is, meaning it is more attractive to PE investments, hence, fund establishment, the higher the performance parameters are. Thus, if a fund is registered in the country group labelled developed, its IRR and net multiple will be associated with better performance by, respectively, 2.20% and 0.13 points. DPI and RVPI, as well, followed the expected trend, with distributions being greater by 18.79% in more attractive countries, while the value concentrated in investments not yet exited is greater by 5.56% in countries with developing environment for PE industry. In line with previous research, increase in fund's size showed to be negatively correlated with performance, while different fund strategies predicted varying results. Notably, all the findings turned out to be more robust in the recent period, taken as 2010-2021, compared to 1989-2009. Results obtained in this paper imply that it would be interesting to focus future research on legal aspects that impact country's attractiveness, as it seems to have significant, yet, unobserved impact on PE industry formation in Europe.

CHAPTER 2 Theoretical Framework

2.1 Introduction

Research done in the field of private equity is extensive, so it is important to note profound findings obtained previously. Considering that the main objective of this research is to divide European funds by country category in terms of how attractive the country is to private equity industry and comparing the performance of these categories, combination of research papers with distinct central questions were collected and summarized below.

2.2.1 Country attractiveness research

While analysing papers that took their studies in the context of Europe, cluster of research works were found that made their objective to define factors of European countries' universal indicators that predict the attractiveness of each country to form a fund in. Some attempts in this field with respect to legal environment, apart from natural focus on economic and financial aspects, were done by several authors.

For instance, Bedu & Montalban (2013) compared attractiveness of European countries based on legal origin and diversity of capitalism theories, differentiating between private equity and venture capital. The authors have identified the list of factors that were found to impact the most the decision of private equity fund to be established in the country, which are: market capitalization, investor protection, protection of property rights, favourable environment for insurance companies' investment, favourable fiscal environment for managers, favourable fiscal R&D incentives for companies, ease of firing workers and Public GERD. In regards to venture capital, authors argue that the higher the tax incentives on R&D push emerging and innovative firms to rely on their operations' revenue, which, in turn, reduces VC investment need. Furthermore, VC industry tends to be more attracted to the countries with high investor protection than PE firms, for the reason of PE funds attracting high-stakes investors ("blockholder-controlled"). When talking about PE, authors found significant evidence of the market capitalisation growth and PE growth to be correlated. Additionally, LBO growth is correlated with low employment protection in the country of activity conduct. However, such indicators as property rights protection and contract enforcement legally have not proved to be meaningful indicators of country's attractiveness.

Yet another paper to explore similar concept is research by Groh, von Liechtenstein & Lieser (2010), preceding the analysis of Bedu & Montalban (2013). Authors find that economic activity, depth of capital market, taxation, investor protection and corporate governance, human and social environment, and entrepreneurial culture are the most meaningful predictors of country to being attractive for PE and VC funds to operate, only three of which, Investor Protection and Corporate

Governance and Depth of Capital Markets, turned out to be universal for all 27 European countries in the sample, ranking UK to be the most attractive out of the whole European Union (at the time it was the part of EU), Germany being moderately more attractive than the EU average. Nordic countries showed high scores as well, while large economies, including France, Italy and Spain proved to be less attractive compared to the EU average.

Research by Bernoth, Colavecchio, & Sass (2010) attempts not only to identify PE investment attractiveness aspects in Europe but construct the comparison of these factors between 14 Western countries and 3 CEE, studying data in 2001-2008 period. After analysing 32 potential influence factors, authors were able to conclude that in both parts of Europe bank lending and market capitalisation to GDP ratio are important predictors of investment flows. Improvement in those parameters is said to have significantly higher impact in CEE countries. Another interesting finding states that the level of taxes is much more important determinant for investment in PE in CEE than it is in Western economies.

As is seen, there is no agreement on exact countries to be most attractive for private equity funds, although UK is always on top, which is the case since it possesses the largest amount of PE firms across Europe. The diversity in the ratings of countries, however, is influenced by three main factors: time period of the research, attractiveness indicators for comparison used and performance measures.

2.2.2 Performance papers

Moving on to the performance overview, paper by Harris et al. (2014) focuses on only two types of funds, which are venture capital and buyout funds. On the basis of 1400 funds that they collected data for, authors were able to conclude that buyouts outperformed S&P 500 by 3% per year on average, with venture funds underperforming the market, on the other hand. It is also concluded that using multiple of invested capital is a better measure than IRR as a summary indicator of performance. Paper by Manac et al. (2022) also finds that venture capital funds are among the poorest performers in terms of IRR. Most importantly, it also concludes that the biggest funds are involved in under-performing segments, reducing their performance. In addition, Kaplan & Schoar (2003) find that private equity firms are very persistent in their high performance, especially considering that this effect could be understated by the inclusion of those firms that are demonstrating low performance and are unlikely to be successful in raising subsequent funds.

Focusing our attention on Europe, Diller & Kaserer (2004) presented wholistic results based on the analysis of 777 PE firms in Europe based on the sample period of 1980-2003, which unfolded that, on average, 23% of funds are drawn down on the vintage date, increasing to, on average, 60% benchmark, while 7 years is the average period for limited partners to get their investment back.

Authors also derived a figure of 12.7% of IRR based on the sample of 200 liquidated fund of funds (so that it would be representative of the whole PE industry performance).

Adding to the literature on private equity performance, Sannajust & Groh (2020) took the approach of looking at the emerging markets funds performance with a central question of the existence of the benefits for first movers. What they found is statistical advantage of entering specific country's market later would yield better returns. Specifically, authors calculated that "…one-year delay to deal closing increases the transaction IRR by between 1 and 2.6 percentage points, on average…", implying that experience in the market plays the founding role in the success of PE firm in emerging market. It is also supported by regressions' results of any specification that yielded significant R^2 ratios, showing that experience on the market and IRR are positively correlated. To further support this claim, paper accounts for the advantage that local firms might have compared to the foreign investors.

2.3 Summary and Hypotheses

Combining previous research findings into the useful implications for performing research on the effect of county on the performance of private equity funds, there are several findings to consider. First, is that the Nordic countries, UK and Germany are the most attractive for private equity firms to operate, while investor protection, corporate governance and depth of capital market predict the attractiveness of European countries the best. Second, in regards to fund strategy, venture capital funds often underperform when compared to other funds (Manac et al., (2022)) and S&P 500 index, while buyout funds overperform S&P 500 (Harris et al. (2014)). Lastly, Diller & Kaserer (2004) derived IRR average of 12.7% based on European sample, which is useful to benchmark fund performance to. Additionally, Manac et al. (2022) observe that larger funds perform worse. Although literature reviewed and the one linked to it include most of the conclusions that could be derived from the information analysed, we can still see no link between the attractiveness of individual country or region and performance of private equity funds there, providing the opportunity to establish such a link in this research.

Hypotheses were formulated on the basis of the literature reviewed, which address influence of the country the fund is registered in on its performance and the impact of size on funds' performance:

H1 (Central hypothesis): Countries with higher depth of capital market determine better performance indicators of PE funds

This hypothesis is of interest because of the conclusions reached by Sannajust & Groh (2020) as well as Groh et al. (2010), which imply that the emerging markets is not necessarily advantageous to operate in, as experience determines a great part of fund's performance and that such high scores in investor protection, corporate governance and depth of capital markets (measured in this paper by combined score of funds registered and market capitalisation to GDP ratio) are attributing to the better performance of funds in countries which have these factors on a high level. Importantly, testing this hypothesis there is a possibility to establish the link between country's attractiveness for PE funds and their performance.

H2: Increase in a fund's size is associated with lower performance

The finding was made in the paper by Manac et al. (2022), who found that funds that are bigger in size of collected capital are performing poorer than those with less funds. Therefore, the expectation is to observe similar relationship in the sample collected.

CHAPTER 3 Data

Taking into consideration that the aim of this paper is to define the effects of country development indicators on the performance of private equity funds in European region, the requirement is to collect the data from the source containing European funds. For this purpose, it was decided to use Preqin database, as it possesses one of the largest global collections of private equity funds compared to other possible sources.

Using Preqin enables comparison of funds on several different dimensions. Internal rate of return (IRR), distributed to paid-in capital (DPI), residual value to paid-in capital (RVPI), called capital, final close size, vintage/inception year, net multiple and many other indicators can be accessed. According to Preqin Data Guide, indicators reported are pre-tax.

IRR is a conventional measure of fund's performance throughout prevalent number of research on private equity, hence, to support transitivity with other results obtained, herewith IRR is used as central performance measure as well. However, it is important to note one pitfall of using this measure. Manipulating the timeline to alter base for IRR calculation seems to be a widely spread practice. Doing so allows funds to inflate their IRRs, which is done by taking short term debt and servicing it by the fees received as a commission for managing limited partners' investment, meaning that for certain period LPs money have not been called. Other potential pitfall related to the first one mentioned has to do with IRR being overstated because of some percentage of funds being kept as reserves. Therefore, ratio of funds called can assist in properly valuing fund's performance once paired with IRR. Additionally, to attract capital at the early stages, fund managers tend to report interim results being initially higher than the actual IRR for that period, which happens most of the times in the absence of requirement to report interim results, so all the numbers are self-reported. Net multiple, however, does not tend to have comparable manipulation potential, as, according to Preqin definition, it is measured as: the ratio between the total value that the limited partner has derived from its interest in the partnership – i.e. distributed cash and securities plus the value of the LP's remaining interest in the partnership – and its total cash investment in the partnership, expressed as a multiple.

Table 1: Preqin definitions of private equity types included in the sample

Balanced	Invests in companies at all stages of development, from early stage to buyout
Buyout	Invests in established companies, often with the intention of improving operations and/or financials. Investment often involves the use of leverage
Co-Investment	Direct investment made by a limited partner in a company/asset backed by a fund. The limited partner therefore acquires two separate stakes in the company/asset: one indirectly through the fund and one directly in the company/asse
Co-Investment MM	A financial instrument that seeks to co-invest in the deals of more than one fund vehicle
Direct Secondaries	The sale of an interest in a direct private equity investment or a portfolio of direct private equity investments to a new third-party investor. The buyer either manages the investment/portfolio or appoints a manager, typically a direct secondaries manager, to do so
Secondaries	Acquires stakes in private equity funds from existing LPs
Venture Capital	Provides capital to new or growing businesses with perceived long-term growth potential. It is split in two main categories, which are: early stage (seed or start-up) and expansion/late stage. This depends on company's (investee) life stage.
Fund of Funds	Invests its capital in a number of limited partnerships
Growth	Typically takes significant minority positions in companies without the use of leverage. Targets profitable, but still maturing, investee companies with significant scope for growth. Investment horizons are mid-to-long term, similar to those seen with buyout funds
Turnaround	Aims to revitalize companies with poor performance or those that are experiencing trading difficulties.

Note: Preqin manual provides the whole list of definitions (see References); "MM" in "Co-Investment MM" stands for Multi-Manager.

CHAPTER 4 Method

Due to the relatively low complexity of data found on the performance of private equity firms in Europe, I am going to use several statistical instruments to analyse and challenge the hypotheses formulated previously. Similar to the research done on private equity funds by Manac et al. (2022), it was decided to present collected indicators in the form of tables to present the data granularly, accenting every aspect of funds that was possible to collect using Preqin.

Following the visual representation of funds strategy, close size and IRRs in aggregated form, separated by countries and regions, the model will be constructed, which have the following variables presented below:

$$(1)\ IRR_i = \alpha_i + \beta_1 \times Country\ group_i + \beta_2 \times Fund\ strategy_i + \beta_3 \times ln(Fund\ Size)_i + \beta_4 \times Vintage\ bracket_i + e_i$$

Regression (1) considers the effect on IRR based on individual country that the PE fund is registered in (based on group effect), the strategy the fund is following, the natural logarithm (In line with Cumming and Dai (2011)) of the fund's size and vintage bracket.

As is seen from the model, the vintage brackets for the sample of obtained data were formed. This includes the following division: 1989-2002, 2003-2006, 2007-2009 and 2010 till the last vintage year in the extract – 2021. Such formation is explained by the economic conditions that affected the whole world, naturally, including Europe. First category that includes years 1989-2002 is established, as year 1989 defines the earliest vintage year in our sample, while 2002 brought more financial regulation in response to accounting scandals related to companies such as Enron, which led to creation of Sarbanes-Oxley Act for more strict corporate supervision and transparency. Second bracket of 2003-2006 features pre-financial crisis period, followed by 2007-2009 crisis period. Although it is known that financial crisis referenced peaked in 2008, we need to take into account the stock market overheating, which implies lower volumes of investments made and at least one year of a recovery period post-crisis. The last group of years is continuous, starting in 2010 ending in 2021. It was decided not to include the year of 2022 and consequent, as 2022 is characterised by widespread accumulation of savings, that resulted in high demand (projected increase of 21% from 2021) for luxury goods and high-stake investments (Bain & Company, November 2022), hence, it can be inferred that formation of private equity funds in 2022 was easier than in past periods. Additionally, it is in the interest of data consistency to exclude funds opened to investment, as their performance indicators would be an approximate, which is usually manipulated at that stage (Brown, Gredil, & Kaplan (2019)), so short-lived funds are also excluded from the sample in that manner. It could be argued that the year of 1992, marked by the start of Basel I exploitation, was overlooked as a

benchmark. However, the only vintage year preceding it in the sample is 1989, which has a count of only 1 datapoint.

Size variable in the regression model is measured in millions of dollars (taken into the natural logarithm. However, Preqin does not adjust fund close size for inflation, therefore the values in a sample were adjusted using CPI index for each of 31 countries following the adjustment made in Manac et al. (2022), taking 2021 as a base year.

Moving forth, country group variable is included in the model, which is meant to reflect each group of countries attractiveness for private equity funds to be registered or located in. Addressing the grouping of countries in European region, two parameters have been included to perform the ranking, namely, stock market capitalisation to GDP ratio (in line with Bernoth, Colavecchio, & Sass (2010)), measured in percentage, and number of funds registered in each country included in the sample. The former data was found on the website of CEIC in combination with OECD database. When collecting the data on the quantity of funds registered, as an approximation, the number of funds that Preqin lists in its database per country was used. Naturally, it might not fully cover the existence of all the funds within the sample period, especially small-sized, but this measure still does represent the financial development of the country. Obtaining these two measures (see Table 5 in Appendix) and lining them up, two groups were identified:

Table 2: Sample countries grouping

Group	Countries included
Developed	Denmark, Finland, Ireland, Jersey, Luxembourg, Netherlands, Sweden, Switzerland, United Kingdom
Developing	Austria, Belgium, Bulgaria, Croatia, Czech Republic, Estonia, France, Germany, Greece, Iceland, Italy, Latvia, Lithuania, Norway, Poland, Portugal, Republic of Serbia, Russian Federation, Slovakia, Spain, Turkey, Ukraine

Note: countries presented in the table represent the countries that observed funds in the sample are registered in; "Group" is the subjective category that countries are placed in based on two parameters, stock market capitalisation to GDP ratio and number of funds registered (taken from Preqin); "Developed" category includes countries that have stock market capitalisation above 90% and funds registered above 150; "Developing" category includes countries that do not qualify to be placed in "Developed" category according to set benchmark. Jersey and Ireland are special cases.

It is worthwhile to note that Jersey was included into the first category due to this island being a known tax haven, with corporate tax rate for financial organisations being 10% (source: government of Jersey). Ireland is also deserving to qualify as developed private equity market, since Brexit made it even more attractive financial centre, in this case, for UK general managers,

to attract European capital. Furthermore, the separation of countries into "developed" and "developing" captures only the two parameters mentioned previously to simplify the analysis, thus, not reflecting objective development as is usually perceived, but rather and exclusively the development in terms of private equity industry operations.

Expanding the regression set, it is compulsory to add more variations of performance prediction indicators other than IRR for the wholesome picture. As discussed previously, IRR can reflect too uniform of return on investment, while in reality certain years could yield abnormal, compared to average, returns, leading to uneven distribution of this indicator. Moreover, if years with highest returns were also marked with high inflation, this further overestimates the IRR. Therefore, RVPI, DPI and net multiple indicators will be used as independent variables on the basis of the main model:

$$(2)\ \textit{Net Multiple}_i = \alpha_i + \beta_1 \times \textit{Country group}_i + \beta_2 \times \textit{Fund strategy}_i + \beta_3 \times \ln(\textit{Fund Size})_i + \beta_4 \times \textit{Vintage bracket}_i + e_i$$

$$(3)\ \textit{DPI}_i = \alpha_i + \beta_1 \times \textit{Country group}_i + \beta_2 \times \textit{Fund strategy}_i + \beta_3 \times \ln(\textit{Fund Size})_i + \beta_4 \times \textit{Vintage bracket}_i + e_i$$

$$(4)\ \textit{RVPI}_i = \alpha_i + \beta_1 \times \textit{Country group}_i + \beta_2 \times \textit{Fund strategy}_i + \beta_3 \times \ln(\textit{Fund Size})_i + \beta_4 \times \textit{Vintage bracket}_i + e_i$$

CHAPTER 5 Results & Discussion

Discussion of the results is started by the descriptive statistics collected on the level of countries that the fund is registered in, developed and developing. It is meaningful to look at the place of registration and not the operations region due to two main factors. First, is that the country that fund is registered in, often will coincide with its activity there, proportionate to all geographies of its presence. Second, place of registration determines the limited partners activity, hence, access to raising desired funds.

Table 3 reveals that in developed countries category funds have approximately twice as big size as they do in developing category. This is the observation that reconfirms the appropriateness of the labels given to two categories. Additionally, "developed" countries possess average GDP per capita of 65,018 USD, which is by, approximately, 20,000 higher than this of counterparts. The two observations from collected sample are in line with the Alexander Peter Groh, Heinrich von Liechtenstein, Karsten Lieser (2010), as "developed" countries include the likes of Switzerland and UK in terms of the rigorousness of their legal system and depth of capital markets, making the group attractive to invest in. Other parameters in Table 3 do not have significant differences, except for IRR and DPI. "Developed" countries have their IRR, on average, at 17.28%, whereas "developing" seeing almost 3% drop – 14.61%, although net multiple is slightly different. In combination with DPI higher by around 20%, findings suggest that "Developed" countries have higher expectations of investors to receive quick and high returns together with stricter regulation in private equity industry. Lastly, Table 3 shows that "Developed" category has significantly higher oscillations in the indicators, implying competitiveness level to be higher.

Table 3: Summary statistics by country group

Indicator	**Developed**			**Developing**		
	Mean	Min.	Max.	Mean	Min.	Max.
Size	1264	4	26111	519.37	2	19804
IRR (%)	17.28	-100	407.69	14.61	-21.4	100
Net Multiple	1.89	0.06	13.24	1.78	0.14	9.46
DPI (%)	111.78	0.05	1235	92.21	0.02	880
RVPI (%)	76.73	0.04	440	86.26	0.15	479
GDP per capita	65018	24006	129810	45220	5338	87739
Observations		552			422	

Note: Size variable is measured in millions USD, in 2021 value; GDP per capita is measured in USD, expressed in absolute value; Min. – denotes the smallest observation in the sample; Max. – denotes the largest observation in the sample.

Preceding the regression analysis in Table 5, it is helpful to first take a look at the overview of types of funds in the sample in Table 4. What is observable, is the prevalence of buyout and venture capital funds (416 and 194, respectively, out of 974). This is easily explained by the fact that these are the earliest strategies established in private equity world. Unfortunately, some of the fund types, such as balanced and turnaround, have only few observations, leading to some the sample selection bias.

Table 4: Summary of the sample in terms of fund strategy

	Number	**Average IRR (%)**	**Average Net multiple**
Balanced	9	24.278	1.792
Buyout	416	17.485	1.857
Co-Investment	13	15.279	1.679
Co-Investment MM	17	16.539	1.757
Direct Secondaries	20	15.761	1.696
Fund of Funds	160	13.278	1.734
Growth	85	15.509	1.746
Secondaries	57	18.898	1.703
Turnaround	3	36.000	2.075
Venture	194	14.365	1.986
Total/Mean/Mean	974	18.74	1.80

Note: Table includes central to PE industry indicators: average IRR and net multiple.

After constructing regressions based on model (1) for all subcategories (a, b, c, d), the results, presented in Table 5, were obtained. Since the sample size of 974 is not large enough for the sample, including 10 different strategy categories, 31 European country and 33 vintage years, it is natural that, considering uneven distribution of funds by inception year, prevalence of funds registered in Western Europe. Specifically, when we observe the number of funds per country, two countries consist 48.41% of the whole sample, which are UK and France, making it unviable to run the regression on all the countries as dummies separately. Therefore, country separation into two groups was performed (see Method).

In regard to the vintage year dummies, the skewness problem in the distribution of this variable also applies. For instance, years 1989-2004 have extremely low quantity of datapoints present, ranging from 1 to 15, these years' coefficients interpretation speculative.

Once the limitations of the regressions mentioned above are taken into account, objective interpretation can be started. Table 5 compares the same model with different independent variables, namely, IRR, net multiple, RVPI and DPI.

Looking at Table 5, decreasing IRR (-2.20%) associated with lower level of country group of private equity development is line with the expectation, as funds in developed countries have access to a larger variety of financing, as well as the economy in those countries would generally consistently grow, allowing for higher returns. It also arises from the fact mentioned previously, when limited partners have high expectation from GPs in terms of returns, because of larger variety of alternative investments. Similarly, country being in the "developing" group is associated with a decrease of 0.13 performance in net multiple. Covering less developed countries in private equity effect on IRR and net multiple, it is already apparent that the results confirm the hypothesis of countries with higher depth of capital markets feature funds that perform better than in developing on that dimension countries. Paper by Sannajust & Groh (2020) seems to predict such results, as authors state that operating private equity fund in emerging economies would yield higher performance results with higher level of experience in that specific market.

However, to confirm the ideas discussed, looking at DPI and RVPI changes is helpful. Looking at DPI coefficient in Table 4 for "developing" countries, there is a difference of 18.79% between the categories. Consistently, operating in "developing" countries is associated with higher RVPI by 5.56%. This is an indication of likely higher investor protection in "developed" country group, as increase in DPI and decrease in RVPI puts emphasis on limited partners' benefits. Higher DPI is also linked to a better performance and intricate fund structure, as it usually happens that distributions occur not only from higher liquidity, but the ability to take on more debt.

Continuing the discussion, Table 5 shows that 1 percentage increase in the size of a fund is associated with all the indicators decreasing. It signals that larger funds become less effective on all the dimensions, yielding lower returns for limited partners and poorer attractiveness of a fund, damaging the general partners reputation. Nevertheless, since general partners are benefitting from the regular fee, usually of 2%, paid by limited partners, they have an incentive to raise more capital, which is less risky source of income than carried interest. This finding is in line with the paper of Manac et al. (2022), who find negative correlation between the increase in size of a fund and its performance. Therefore, findings confirm the second hypothesis about the decrease of a performance of a fund with increase in size.

As for the vintage years of funds' establishment, despite the expectation of seeing significantly lower performance in the crisis period of 2007-2009, funds established during these years have not been doing much worse than those in 2003-2006. Considering that funds with an inception year before 2003 or after 2009, the conclusion can be made that the successful investment horizon of most funds is significantly more extended than 5 years, as it is likely that most of the funds established after 2003 have felt the consequences of crisis uniformly.

Table 5: Regressions' results

Coefficient	IRR (%)	Net Multiple	DPI (%)	RVPI (%)
Developing	-2.20*	-0.13**	-18.79***	5.56
Balanced	7.39	-0.14	-7.77	-6.36
Co-Investment	-4.71	-0.34**	-34.76*	0.79
Co-Investment MM	-2.43*	-0.16*	-37.56**	21.56
Direct Secondaries	-0.53	-0.19	-14.94	-4.48
Fund of Funds	-2.48***	-0.12*	-22.82***	10.81**
Growth	-2.51	-0.19*	-26.64**	7.41
Secondaries	0.09	-0.21	-7.06	-13.57*
Turnaround	14.35***	1.64*	119.75	43.89
Venture	-1.72	0.05	-33.37**	38.84***
Ln(Size)	-0.31	-0.08***	-4.54*	-3.18**
1989-2002	-8.61***	-0.18	58.50***	-76.23***
2003-2006	-10.42***	-0.30***	32.69***	-62.82***
2007-2009	-10.07***	-0.37***	23.94***	-60.44***
Constant	22.71***	2.47***	141.28***	105.77***

Note: "Developing" coefficient represents the impact of countries being in this group on performance measure; Strategy dummies list categories benchmarked to buyout funds; Vintage bracket present 4 categories, 1989-2002, 2003-2006; 2007-2009 and 2010-2021, which is set as a benchmark; Ln(Size) variable represents the natural logarithm of size, initially measured in millions of dollars of raised funds; Significance level is marked by stars, with * - implying significance on a 10% level, ** - 5% level and *** - 1%.

Lastly, it is interesting to observe the pattern of funds' performance in terms of their strategies. Table 5 coefficients suggest that there were only three types of funds doing better in terms of IRR than buyouts: balanced, secondaries and turnaround. However, net multiple coefficients suggest that venture capital and turnaround funds were the only once in terms of fund strategy to outperform buyouts.

Robustness through time

To further test the observations discussed earlier, the effect of recency of funds' establishment was considered, since it is known that the private equity market has been truly developed since recent times. The construction of the additional regressions, following the model laid out in methodology, was performed. Unlike previous regressions, only two, most important variables predicting performance were left as independent variables, while vintage bracket was removed as a control variable due to the split of the regressions based on the two timeframes: 1989-2009 and 2010-2021.

Table 6: Performance of PE funds under different timeframe

Coefficient	**IRR (%)**		**Net Multiple**	
	1989-2009	**2010-2021**	**1989-2009**	**2010-2021**
Developing	-0.71	-3.13*	-0.06	-0.17**
Balanced	24.30	-1.90	-0.54**	-0.00
Co-Investment	-1.81	-4.56	-0.67***	-0.28
Co-Investment MM	-5.48*	-1.68	-0.61***	-0.07
Direct Secondaries	2.38	-3.05	-0.05	-0.33**
Fund of Funds	-3.73**	-2.51**	-0.20	-0.13**
Growth	-7.48*	-1.17	-0.52**	-0.10
Secondaries	-0.57	0.83	-0.00	-0.19***
Turnaround	-	14.54***	-	1.66*
Venture	-9.18***	2.87	-0.39	0.34*
Ln(Size)	-0.15	-0.42	-0.06	-0.08***
Constant	13.70***	22.91***	2.21***	2.47***

Note: "-" sign indicates the absence of the observations on Turnaround fund category in years 1989-2009 in the sample; Significance level is marked by stars, with * - implying significance on a 10% level, ** - 5% level and *** - 1%.

Observing the results in Table 6, it is immediately visible how pronounced the difference in the coefficients is between the funds established within 2010-2021 period and earlier, in 1989-2009. Thus, funds operating in more attractive and developed financially countries predicted to produce IRR, which is 0.71% and 3.13% higher in years 1989-2009 and 2010-2021, respectively, showing the increase of 2.42% in recent period. Like IRR, net multiple coefficients demonstrate 0.11 points advantage increase in this indicator when comparing two periods. Based on the size variable in the regressions in Table 6 we can accept our alternative hypothesis 2, consistent with Table 5, predicting lower performance indicators with 1% fund size increase, showing more robust results through time.

Considering the regressions' results in Table 5 and Table 6, it can be concluded that funds established more recently in countries, considered attractive for PE fund establishment, have

significantly more pronounced performance advantage in terms of both IRR and net multiple. Therefore, the observation that with PE industry development through time more attractive countries outpace their counterparts in terms of performance gives room to argue that the agglomeration effect plays the top role in the formation of such advantage. This is especially true for such countries as United Kingdom, Netherlands and Switzerland. All three countries are known for their historical intricacy and efficacy in wealth management due to great capital accumulation due to colonial past (UK and Netherlands) or conditions that formed a safe hub (as in the case of Switzerland), which implies that alternative investments, such as private equity, would definitely attract the attention of institutional investors at earliest stages of development possible, leading further to competitive advantage in PE operations. In their turn, Luxembourg and Jersey attract private equity formation due to appealing tax rates. As such, maximum level of tax on distribution reaches 15% at maximum (source: The Government of Luxembourg), making Luxembourg attractive not only for GPs to operate from, but also for LPs to invest in. Similarly, Jersey features some attractive rates on financial activity and partnerships. All of it hints at that sophisticated general partners, having valuable experience, choose countries with high emphasis on legal benefits and overall financial activity, which in turn yields high performance figures of PE funds in these countries.

There are multiple reasons that could affect the performance distinction between countries based on their attractiveness to be more pronounced in recent years compared to the earlier period. To start with, the initial access to larger capital markets in certain countries, such as United Kingdom and Netherlands, resulted in clear advantage of PE funds there to be established at a higher pace than in developing economies. This fact was supported by the, generally, high skill of professionals operating in countries with prosperous economies, which lead to swift knowledge accumulation and reinforcement of the initial competitive advantage. Another factor that could influence the foundational formation of PE industry strength in certain country, is, as discussed, favourable tax regime, associated with legal side of doing business.

With the passage of time, it is likely that beginner general partners, despite their geographic focus of potential investments, considered registering a fund in the most welcoming place, "welcoming" being defined by the experience of already existing and liquidated funds. This experience could then be analysed more effectively in recent years, given larger data sample. Linked to this logical chain, the agglomeration effect realms the European PE market, although it is obvious that the fund management is more efficient when registered in the country of target operations. However, it is worth noting that most funds are diversifying their investments, operating in several European countries simultaneously, making the fund registration decision linked to mostly legal concerns and benefits, as operations within European Union are simplified. Considering arguments stated, the concentration of funds in more attractive countries could arise only with time, and such a

trend reinforces the performance advantage that these more financially developed environments possess compared to the counterparts.

CHAPTER 6 Conclusion

This research touches upon the relationship between country's financial development in PE industry in Europe, also referred to as attractiveness, and the performance indicators, as previous literature, as far as my study went, was not aimed at establishing a link between the two. Nevertheless, research performed previously provides excellent coverage on topics of attractiveness of countries for private equity investments and of performance of private equity funds. Researchers mentioned in the paper were able to identify universal set of European countries' attractiveness predictors, including investor protection, corporate governance and depth of capital market metrics. Papers that evaluated performance stressed the usage of IRR and net multiple as the most accurate measure of funds' performance, while contributing to intercomparison of funds' strategies in the aspect of performance.

Observations and conclusions reached in the works evaluated in the literature review laid a solid foundation for methodology utilised in this study. From the research done on the most appropriate predictors of country's attractiveness in Europe, the division of sample countries was performed, dividing them according to the market capitalisation to GDP ratio and number of funds registered (according to Preqin) in each individual country, forming "developed" and "developing" groups. To test whether more attractive countries show better performance results, descriptive statistics and regression models were analysed. Key metrics were measured by IRR and net multiple, supplemented by DPI and RVPI ratios for robustness check, while natural logarithm of size variable adjusted for inflation and fund strategy classification were used as control variables in the regressions.

In line with the expectations, research was able to establish positive relationship between European country's attractiveness for PE fund establishment, most recent period of 2010-2021 showing 3.13% difference in IRR and 0.17 points difference in net multiple when comparing two country groups formed for the analysis. Overall, this relationship suggests that identifying attractive country to operate PE fund in is one of the priorities general partners need to consider. Confirming the findings of Manac et al. (2022), the increase in size predicted lower performance on both IRR and net multiple measures.

Limitations

Due to the construction of the research done, two issues impacting the significance of the results arise. First relates to the sample selection bias, which occurs even though the Preqin database utilised is one of the leaders in collecting the data on private equity funds. Specifically, sample observed suffers from the omission of relatively small funds in terms of investments collected, as well as funds that operate in developing economies, such as Ukraine or Romania, negatively impacting objectivity of the results. Second issue could be described as reverse causality problem, inherently rooted in the country's attractiveness indicators. It could be argued that as much as attractive parameters of financial and legal aspects of a country welcome private equity establishment, successful examples of PE operations in such a country strengthen the economy and conditions favourable for PE funds' performance. Nevertheless, this reverse causality seems not to overshadow the effect of country's attractiveness.

Considering the limitations of this paper, follow up research on performance comparison of PE funds across Europe based on attractiveness could dive much more in depth into the legal aspects of each European country, such as tax regimes, ease of the fund registration and the like. This would lay stronger foundation to the attractiveness index, although these kinds of indexes will be very time-sensitive, meaning that they would need to be updated quite often. Once such a specific index was formed, more granular split of country's categories is advisable, to compare attractiveness-performance relationship on larger variety of dimensions. Lastly, highest value addition on the topic studied is covering the unobserved part of funds, predominantly in Eastern, less developed, countries. This is crucial, as funds that are not willing to report the performance indicators might be very effectively managed, significantly changing the analysis results.

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APPENDIX

Table 7: Preqin definition of venture capital funds

Early Stage	Type of venture capital fund that invests only in the early stage of a company's life. Can be either Seed or Start-up
Eerly Stage: Seed	Allows a business concept to be developed – perhaps involving the production of a business plan, prototypes, and additional research – prior to bringing a product to market and commencing large- scale manufacturing
Early Stage: Start-up	Supports a non-commercial company's product development and marketing.
Expansion/Late stage	Invests in companies towards the end of the venture stage cycle. Provides capital injections for expansion into a position of stable profit streams. Typical with venture capital deals, expansion/late- stage funds take short- to mid-term, minority positions

Note: This table further classifies venture funds included in the sample. Source: Preqin

Table 8: Sample countries financial indicators

Country	Number of registered PE	Stock Market Cap. to GDP (%)
Austria	67	27.72
Belgium	126	68.64
Bulgaria	24	19.36
Croatia	15	37.26
Czech Republic	27	10.63
Denmark	152	125.96
Estonia	25	10.94
Finland	241	97.83
France	1197	79.15
Germany	723	48.33
Greece	33	22.59
Iceland	25	42.87
Ireland	78	44.89
Italy	287	24.57
Jersey	21	-
Latvia	23	3.40
Lithuania	19	8.29
Luxembourg	167	100.29
Netherlands	347	91.57
Norway	219	57.49
Poland	82	31.89
Portugal	116	29.72

Russian Federation	108	10.08
Republic of Serbia	1	9.09
Slovak Republic	12	5.36
Spain	438	67.28
Sweden	203	148.37
Switzerland	407	211.17
Turkey	29	26.06
Ukraine	12	10.31
United Kingdom	1804	119.00
Total/Mean	7028	53.00

Note: The table includes all the funds in the sample registered (known to Preqin) in years 1979-2022 in each country in the sample; Stock market capitalisation to GDP ratio was collected as an average of years 2010-2021 that were available from OECD database and CEIC; Jersey does not have its own stock exchange, hence blank field for its stock market to GDP ratio.