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**A cross-continental perspective: exploring the influence of cultural differences and regulatory frameworks on private equity fund performance in Europe and North America**

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## **ABSTRACT**

This thesis examines the effect of cultural differences and governmental regulation on private equity fund performance. Previous research shows an impact of culture and regulation on financial decision making this could easily influence private equity returns and fund performance. Data on private equity fund performance is collected for all European countries and the United States. The timeframe used for the performed panel data regressions spans from 2010 to 2020. In my regressions I analyse the effect of governmental regulation and two cultural dimensions designed by Hofstede (2001); individualism and uncertainty avoidance. When analysing the results, I find that uncertainty avoidance negatively impacts private equity fund performance. Thus, countries which possess a higher level of uncertainty avoidance could showcase a lower level of national fund performance.

**Keywords:**

Private equity, fund performance, culture, regulation, cross country effects, internal rate of return.

**JEL codes:** G23, G24, G28, G32, L25

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## CHAPTER 1 Introduction

Private equity funds and venture capitalist have large amounts of money available for investing in projects or companies. Analysts try to make the best possible estimation of the reality in terms of the future profits of certain projects. In most cases investment behavior could be of great influence on the fund performance. Investment behavior could be explained by risk tolerance and investor's choice. This in turn, can be caused by cultural differences. Although, private equity was first established in the United States, it has also gained popularity in Europe over the years (Seretakis, 2013). While in 2005 majority of private equity funds were based in the United States, today, there is an increasing number of private equity funds emerging in Western Europe (Megginson, 2005). Besides, there is a difference in fund performance between the United States and European countries. Knowing that there are vast differences in culture and regulation between the United States and different European countries, I will compare different countries based on private equity performance, cultural differences, and regulation. Lately the market for mergers and acquisitions has slowed down and private equity performance has been falling. It has mostly been silenced by uncertain macroeconomic conditions, high inflation, and rapidly rising interest rates (*Wie laat zich uitkleden voor Bugaboo?*, 2023). Regarding this, certain regulation or different investors' behavior could stimulate the market for mergers and acquisitions.

Numerous studies have been conducted on private equity funds and their performance. In their paper Walz and Cumming (2004) state that fund performance is often measured by the Internal Rate of Return (IRR). On top of this they also show that regulation in different countries significantly contributes to fund performance. The more secure the legal framework, the higher the IRRs. The IRR method is used to try and estimate the financial efficiency of investments. The IRR provides appropriate recommendations to help form an opinion about investment opportunities (Lu and Yin, 2021). Existing research indicates that cultural differences might explain risk avoidance and investors' preferences (Anderson et al., 2011). Culture can often be described as a system of traditional behavior, shared values, beliefs, and traits (Stulz & Williamson, 2003). A culture can be considered in a variety of ways in forms of traditional behavior, certain characteristics for a country, a society, a certain race, or of a period in time (Birukou et al., 2013). Besides as cited by Bailey and Peoples (1998) culture is the socially transmitted knowledge and behavior shared by a group of people. As shown the existing literature agrees that culture arose from something shared and learned by a certain group of people. On the other hand, the content of culture varies between countries, which can refer to behavior, knowledge, beliefs, norms, and ideas (Axelrod, 1997). It is important to study the relationship between culture and fund performance because it affects financial decision-making (Breuer and Nadler, 2015) and PE firms are often exposed to different cultural backgrounds. Thus, in this study I will explore if cultural differences and regulation affect investors' behavior and thus fund performance. Hofstede (2003) figured that culture can be measured by 5 dimensions Power Distance, Individualism,

Masculinity, Uncertainty Avoidance, and Long-Term Orientation. The sixth dimension to measure culture is Indulgence (Hofstede and Minkov, 2010). To investigate the impact of cultural differences on fund performance I focus on two cultural dimensions which have often been linked to financial decision-making and investment choices; individualism and uncertainty avoidance (Hofstede, 2001). These two dimensions are the most relevant to the investors' environment. Uncertainty avoidance measures the degree of risk tolerance in a country. Individualism measures the degree of interdependence in countries. Primarily this has to do with whether people's self-image is defined in terms of "I" or "We".

For this paper I will replicate the study by Fernandez-Perez et al., (2021) on the cultural effect on stock market response concerning the COVID-19 pandemic. No study has yet examined the cultural and regulatory effect on fund performance. By examining the effect on fund performance instead of the effect on stock market response this could give us a broader understanding of the effect of cultural differences and regulation. Thus, in addition to Fernandez-Perez et al. I will investigate the effect of cultural differences and regulation on the performance of private equity funds. In this study I will research the fund performance of private equity funds in Europe and the United States, because there are cultural differences and more regulation regarding private equity funds in Europe (Payne, 2011). I will research the cultural differences of Europe and the United States according to Hofstede's country comparison tool (Country comparison tool, w.d.). By examining this, I want to verify if there are differences in fund performance in European private equity funds compared to North American private equity funds regarding cultural differences and regulation. This leads to the following research question: *How will cultural differences and regulation affect the fund performance for private equity funds in Europe compared to private equity funds in North America?*



## **CHAPTER 2 Theoretical Framework**

In this section I will provide a theoretical framework that enables me to generate testable hypotheses for my empirical research. I will introduce private equity as an asset class, culture, and regulation. This paper aims to distinguish the relationship between cultural differences, regulation, and private equity performance.

### **2.1 Private equity funds**

The private equity industry has expanded substantially over the last 30 years. Its overall relevance in the economy as well as assets under management (AUM) have grown significantly during this time. Originally private equity was a specific and small part of the financial market, now it is an important and indispensable component of the portfolios of institutional investors (Sensoy et al., 2014). Nowadays, private equity serves as a major driver of entrepreneurial activity and capital formation.

Private equity firms are typically structured as limited partnerships with the purpose of facilitating investments that would not be funded through traditional capital sources. Investing by private equity firms is usually carried out by general partners (GP's) who serve the limited partners (LP's). As stated by Kaplan and Schoar (2005) limited partners are mainly institutional investors or wealthy individuals who provide the private equity fund with capital. The liability of the limited partner is limited to the amount of capital they invest. General partners are assigned with responsibility for overseeing the management, operations, and allocation of the committed capital. Opposed to limited partners, they bear complete responsibility for any debts incurred by the partnership (Horton, 2022). The compensation structure for general partners consists of an annual management fee around 1-2% of committed capital and a variable portion which is usually around 20% of fund profits (Gompers & Lerner, 1999).

#### ***2.1.1 Definition of private equity***

Private equity is commonly understood as a group of investors acquiring or facilitating the acquisition of an established company with the belief that a change in governance and management approach will result in higher returns (G. Wood & Wright, 2010). Private equity, as the name implies, is not required to disclose information to the public (Kaplan & Schoar, 2005). Private equity refers to having ownership or a stake in a company that is not publicly listed or traded. They purchase stakes in private companies or acquire control of public companies to take them private (Segal, 2022). The amount of committed capital, assets under management or fund size differs per fund. The public equity market outweighs the private equity market as there are many more public companies. Publicly traded companies are companies whose ownership is arranged through stock shares which are traded freely and are listed on a stock exchange. Many managers believe that being a publicly traded company entails numerous opportunities and flexibility. Besides, it would provide financial reliability and

security. There is a striking contrast between the structure and operational activities of the public and private equity market. Private equity is mostly defined by later stage investments and transactions involving mature companies. Some include early-stage investments by venture capital firms as well. Rather than offering capital in exchange for shares like public investors, private equity investors claim to add a certain value to the companies they invest in (Moon, 2006). Wright et al. (2000) show that private equity investors claim they are adding value by changing the governance and management style of a matured enterprise.

### ***2.1.2 Private equity fund performance***

Different fund characteristics can have an impact on private equity fund performance. These characteristics include fund type, fund size, fund sequence, and cash flows. It is important to delve further in the specific aspects that influence private equity fund performance, to better understand the realization of fund performance.

Different fund types include venture capital or leveraged buy outs. The difference between venture capital and buy outs is the timing of the investment (Wood & Wright, 2010). Although there is a big difference in performance between venture capital and buyouts. Previous research has found that U.S. buyout funds outperforms the public market by 20-27% over the life of the fund. In contrast with venture capital that has underperformed the public market over the last decade (Harris et al., 2014).

Fund size is typically measured by the total assets under management. This entails the total market value of the investments or the resources available for doing investments by a private equity firm (Chen, 2022). It remains questionable if fund size influences fund performance. For buyout funds literature confirmed the absence of a significant relation between fund size and fund performance (Harris et al., 2014). Although other papers confirm a positive significant relation between fund size and fund performance, validating the use of fund size rather than fund sequence. As there is a positive, but not always significant relation between fund sequence and fund performance (Phalippou & Gottschalg, 2009).

Walz and Cumming (2004) state that fund performance is often measured by the Internal Rate of Return (IRR). The IRR is an absolute measure and is used to try and estimate the financial efficiency of investments. Besides, the IRR provides appropriate recommendations to help form an opinion about investment opportunities (Lu & Yin, 2021). A higher IRR implicates a higher rate of return on investments, which means a better private equity fund performance. In practice relative metrics like the Public Market Equivalent (PME) result in higher fund performance measures compared to absolute indicators like the IRR (Robinson & Sensoy, 2016). Still the IRR remains the most common way to measure fund performance (Aigner et al., 2008).

## **2.2 Cultural differences**

As shown by Axelrod (1997) the cultural content between countries varies, this depends on certain behaviour, knowledge, beliefs, norms, and ideas. Cultural differences can be observed in multiple forms. The study of country comparison by Hofstede (1980), remains the most notable study for assessing cultural differences at national level. According to Hofstede, culture is defined as “*the collective programming of minds*” that separates people into different cultural groups and recognizes value as the fundamental components of cultures. Hofstede defined the following six cultural dimensions for measuring culture: power distance, individualism, masculinity, uncertainty avoidance, long term orientation, and indulgence (Hofstede, 2007). These dimensions are compatible for measuring a national culture, since they impact ethical decision-making, business ethics, and organization structure (Vitell et al., 1993). In addition to this, national culture also affects behavior, rationality, and personal norms and values (Minkov & Hofstede, 2011). The paper of Calori et al. (1994) used Hofstede’s framework to analyze the relationship between differences in national culture and decisions in corporates. The two cultural dimensions best suited to investigate influence on fund performance and often associated with financial decision making and investment decisions are individualism and uncertainty avoidance (Hofstede, 2001). Stated by Eckhardt (2002) uncertainty avoidance is defined as a country’s tolerance of the unpredictable. Furthermore, individualism is defined by the extent to which the individual’s interests prevail over the group’s interests in a certain country. When examining North America and Europe it becomes apparent that European countries and the United States possess diverse national cultures. Examining the relationship between culture and private equity performance is essential, since exit decisions and operating performance play a significant role in generating private equity value.

### **2.2.1 Culture and private equity in North America**

North American culture is remarkably diverse. This is mainly due to various cultural influences, traditions and values which arose from a difficult history of colonization, migration, and imperialism. Continental and overseas expansion have formed their culture (Kaplan and Donald, 1993). According to Hofstede’s research (2001), cultures of countries can be characterized by six cultural dimensions. Following Hofstede’s studies on cultural difference the United States is characterized by having an individualistic society and a low preference for uncertainty avoidance. This could impact financial decision making.

Being a United States invention, private equity investments first emerged in the United States in 1980 as an investment strategy. Over the years PE has evolved from a small asset class to a key participant in the world economy. In the United States the private equity industry experienced a major growth in leveraged buy outs (LBO’s) in line with the development of a very liquid debt market with high returns (Seretakakis, 2013).

The private equity industry developed as the popularity of leveraged buy outs grew as a result the United States witnessed a significant growth in its private equity industry. This growth has been a driver for entrepreneurship and innovation. However, a lot of critics are questioning the extent to which private equity adds value. Despite the positive impact on entrepreneurial activity and driving innovation, there are concerns regarding the actual value creation of private equity (Lerner et al., 2011). A certain level of individualism could also affect the added value of private equity firms. According to Hofstede (2001) individualism represents the extent to which individuals prioritize their own interests over the group's interest. In highly individualistic societies, individuals tend to prioritize their own personal happiness and care less about the well-being of the broader community. This can for example result in general partners pursuing their own interests instead of prioritizing what is most beneficial for the investors. Or this leads to so-called 'quick flips', this occurs when a private equity firm sells off an investment within a year. This raises concerns regarding the extent to which general partners prioritize long-term value creation versus pursuing quick personal financial gains (Lerner et al., 2011). Based on this knowledge, the following hypothesis can be derived:

*Hypothesis 1: A higher level of the cultural dimension Individualism is negatively associated with private equity fund performance.*

### **2.2.2 Culture and private equity in Europe**

To define Europe's culture this is highly dependent on the increasing importance of the European Union (Hansen, 2004). Consulted from European-union.europa.eu the European Union currently has 27 member states. Within the European Union there are 24 official languages spoken. The European border stretches from the Atlantic Ocean to the North of Lapland to the Mediterranean Sea, within this area, there exist various cultures (Rehn, 2005). According to Hofstede's cultural dimensions Portuguese, Spanish, Greek and Polish culture all four exhibit a significant level of uncertainty avoidance. On the other hand, the Netherlands, Germany, Denmark and Sweden have a lower preference for uncertainty avoidance. This demonstrates a more relaxed attitude towards the unknown (Hofstede, n.d.). Although patience, which is essential for success, is related to high uncertainty avoidance, low uncertainty avoidance also results in positive effects (Helmold et al., 2022).

Private equity investing first settled in the United States and developed remarkably. Only around the 1990s, private equity established in Europe. This shows slower development of the European private equity market. Nowadays, European private equity and venture capital firms have allocated approximately €350 billion in around 28.000 European companies since 2007 (Lavine, 2015). However, private equity encountered several setbacks in its development in Europe. Following the bursting of the dotcom bubble in 2000 and 2001, which declined the asset prices and activity in the private equity market. Regarding this decreased activity European private equity investors moved towards less risky investments. Funds raised by private equity firms stabilized when the prices adapted

in 2004 (European Central Bank, 2005). As studied by Amirhosseini and Okere (2012) a higher level of uncertainty avoidance could have had a significant impact on moving towards less risky investment decisions. Howcroft et al. (2003) said when investors are more risk averse, they feel easily threatened by losses and they usually tend to develop strategies to reduce risk. People in Europe tend to be more risk averse, which could have again led to moving towards less risky investments. Earlier research such as Drakos (2006) and Federer (1993) reported a negative and significant impact of uncertainty on investments and thus fund performance. Besides, uncertainty can lead to investors adjusting their investment levels, which is highly contingent on their preference towards risk (Njindan Iyke & Ho, 2017). Based on the above-mentioned uncertainty avoidance is said to have a significant effect on investment decisions and thus on fund performance. According to this the following hypothesis has been formulated:

*Hypothesis 2: A higher level of the cultural dimension uncertainty avoidance is negatively related to private equity fund performance.*

### **2.3 Regulation regarding private equity**

Historically, the relationship between regulation and business has always been controversial. There are numerous disagreements regarding the most effective way to govern a country. Where there used to be a laissez-faire approach most governments have long deviated from laissez-faire economic policies. Frequently in favour of businesses interests by implementing tariffs, subsidies, and price controls (Shaffer, 1995). The impact of regulation at firm level mostly affects their profitability. Firms are likely to adapt regulation which benefits their own operations, they will try and aim for a comparative advantage against their competition. Literature refers to this as the strategic use of public policy (Wood, 1985). Public policy and legislation differ between countries and certain governments tend to have less corporate accountability standards. This refers to having lower requirements for companies to be responsible for their actions, mostly to encourage foreign direct investment (Cumming & Johan, 2007).

Regarding private equity there is a history of lack of regulation in most parts of the industry. While tax laws and securities and exchange commission regulations have a significant impact on the private equity market (Cumming et al., 2010). Since the financial crisis in 2007 this lack of regulation concerning private equity has ended. An example of a region where private equity is well regulated is Europe, where comprehensive frameworks such as the Alternative Investment Fund Managers Directive (AIFMD) and Markets in Financial Instruments Directive (MiFID) govern the activities of private equity funds. These regulations provide investor protection and regulatory oversight (Directive 2011/61/EU, 2011). In contrast to the United States where governments are less eager to control private equity and reduce tax advantages (Spliid, 2013).

In response to the above mentioned big financial crisis in 2007, policy makers increased their attention to more strict private equity fund regulation. Multiple studies have examined the relationship between governmental regulation and private equity performance. In the following section I will present an overview of diverse perspectives both in favor of and against regulation, portraying the ongoing debate. According to Cumming and Zambelli (2013) excessive regulation leads to inefficiency, which is associated with lower private equity performance. According to their research this can result in 15-20% lower private equity returns. Besides, worldwide reports provided by industry experts align with the perspective that regulation is delaying the development of private equity markets the most (Deloitte Touche Tohmatsu, 2006). On the contrary regulation provides a safer environment for private equity funds and their investors, in a highly illiquid market. Regulations could lower the level of risk and repair the imbalance between investors and private equity funds (McCahery & Vermeulen, 2012). Europe has more regulation private equity compared to the United States, but Europe remains competitive and is able to keep up with the North American private equity market (Payne, 2011). Within the private equity industry there is an ongoing dilemma between more regulation to increase transparency and reduce risks without destroying the flexibility and the benefits private equity yields (McCahery & Vermeulen, 2012). Based on the existing literature and previous research, this paper proposes the following hypothesis to investigate the relationship between governmental regulation and private equity performance:

*Hypothesis 3: Greater governmental regulation on international trading positively affects private equity fund performance.*

## CHAPTER 3 Data

### 3.1 Sample

In this research the effect of culture and regulation on fund performance is examined. The sample used in this paper consists of private equity performance measurements, two culture indicators, one regulation indicator and three control variables. I have collected panel data on all European countries and the United States for the period from 2010-2020. The chosen timeline is interesting to examine since the PE market gradually experienced growth again following the crisis of 2009 (Schipper, 2011). I chose to examine Europe and the United States because they exhibit the highest private equity activity and have the most advanced markets in this industry (Folus & Boutron, 2015). The private equity performance measurements are collected directly from Preqin database, access to this data has been granted to me by Erasmus University. The sample focuses on liquidated private equity firms with buy out strategies. To avoid the use of fund's self-reported IRR's, I chose to examine liquidated firms with realized returns. According to Kaplan and Schoar (2005) nonliquidated firms should be excluded from the sample because they could bias the analysis. Private equity performance in this research is narrowed down to firms which focus on buy out strategies excluding venture capital (Early Stage, Seed, Start-up, Expansion, Late stage) to primarily focus on mature private equity funds. Additionally, to be eligible for inclusion in the sample private equity funds needed to have performance data accessible for the years ranging from 2010-2020. Hence, countries with missing values in key variables are removed from the sample. Due to culture and regulation being measurements on annual country level, I took the average fund performance per year per country. This average is calculated by summing up fund performance of each individual fund in a specific country and dividing it by the total number of PE funds. As a result of the sample selection, a total of 211 observations have been obtained.

Data on culture of the countries included in my research is collected from Hofstede's country comparison tool (Hofstede, n.d.). Information on regulation is accessible through the Quality of Government (QOG) database. To collect data on regulation I chose to obtain information on the Economic Freedom of the World index from the OECD time series data set. Economic growth and inflation as control variables are collected from the World Bank. The database accessed to gather this data is the World Development Indicators database. Ultimately, data on fund size was also collected from Preqin database and modified to an annual average per country.

### 3.1.1 Variables

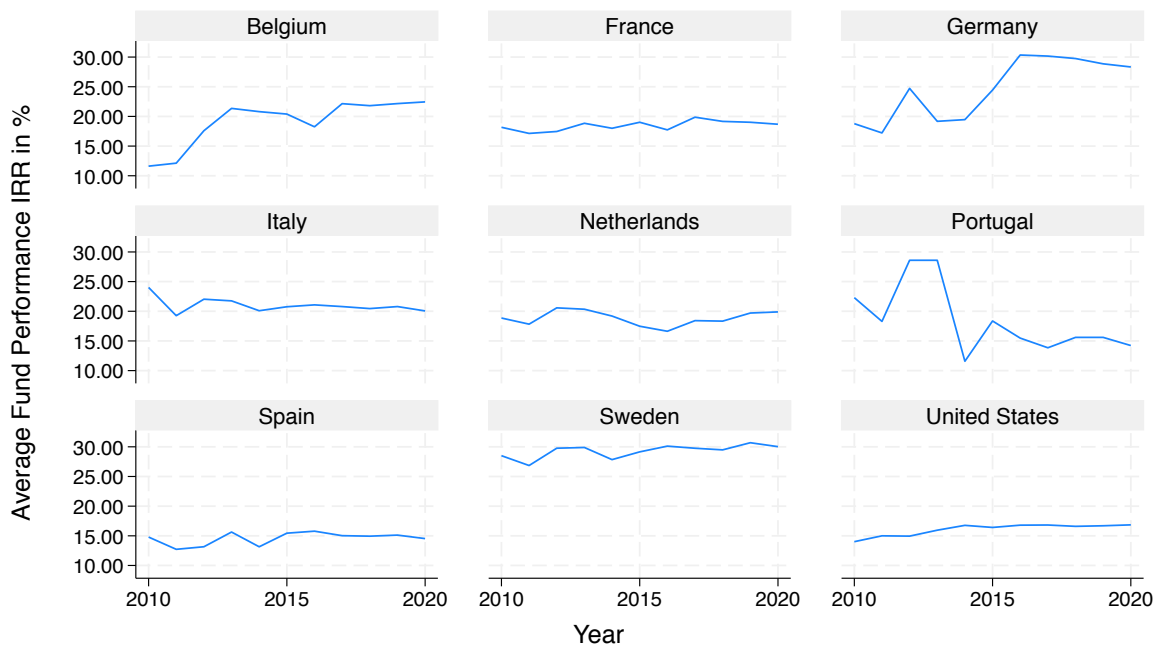
**Fund performance.** Consistent with prior studies and knowledge, fund performance is measured by the Internal Rate of return (IRR) (Walz & Cumming, 2004). According to Kaplan and Sensoy (2015) measuring PE performance with the IRR is a common practice. Besides, multiple institutions like the EVCA (European Venture Capital Association) use the IRR as a standard to measure fund performance. The IRR calculation also incorporates the estimated value of unrealized investments known as the net asset value the NAV (Harris et al., 2014). The IRR in this paper is measured on a national level. To be able to measure the IRR on a national level, I took a country average of the available fund IRR's. My calculations are presented in the equation below:

$$\text{Fund performance IRR \%} = \frac{\sum \text{of individual PE IRR 's per country}}{\text{Total number of liquidated PE funds}} \quad (1)$$

To enhance the understanding of the data and provide a visual representation of the distribution of the average IRR's. The country averages of the IRR of 8 European countries and the United States can be observed in Figure 1.

**Figure 1**

*Average Internal Rate of Return per country*





**Culture variables: Individualism (IND) & Uncertainty avoidance (UAI).** These variables represent the culture within a certain country based on the cultural dimensions by Hofstede (2001). Drawing from prior research by Hofstede and analysing the effect of each individual cultural dimension, I have obtained substantial evidence that two out of six dimensions (individualism and uncertainty avoidance) strongly impact private equity fund performance. Additionally, Beugelsdijk and Frijns (2010) demonstrate that culture has an impact on decisions about (foreign) investments. For my empirical analysis, I measured individualism and uncertainty avoidance based on Hofstede's scores. Chui et al. (2010) state that individualism is expected to be correlated with overconfidence, which could affect financial decision making. Next to this, it is known that uncertainty avoidance shapes financial decision making (Kubilay & Bayrakdaroglu, 2016). The cultural dimension scores are distributed from 0-100. For individualism this entails the following: zero being a collectivist society and 100 a highly individualistic society. For uncertainty avoidance this means: zero is a country with a very low preference for uncertainty avoidance and 100 a country with a very high preference for avoiding uncertainty.

**Regulation variable: Economic Freedom of the world index (fi\_index).** For measuring regulation regarding financial decision making, I have chosen to investigate the Economic Freedom of the World index. This index consists of 21 components developed to identify the consistency of economic policies or institutional arrangements regarding regulation of credit, labour and business, size of government, legal structure and security of property rights, access to sound money, and freedom to trade internationally. This index ranges from 0-10, with 0 indicating lower economic freedom and 10 indicating higher economic freedom.

### **3.1.2 Control variables**

**Inflation.** Adding a country-specific control variable allows me to account for unique country specific characteristics, like inflation, which differs per year and per country. Using inflation as a control variable will help to isolate the impact of culture and regulation on private equity fund performance. Inflation is measured as a GDP deflator in percentage of a certain country in a specific year. The obtained data on inflation is accessible through the World Bank from the World Development Indicators database.

**Economic growth.** To control for macro-economic changes over the chosen period from 2010-2020, I have included Economic growth as a control variable. Economic growth is measured as a GDP annual growth percentage. Data on changes in economic growth is obtained from the World Bank from the following database: World Development Indicators.

**Fund size.** Fund size is an often-used variable in existing PE performance research (Kaplan & Schoar, 2005; Da Rin & Phalippou, 2017). Data on fund size is collected from Preqin database. Fund size is defined as the total amount of capital that the fund raises (Humphery-Jenner, 2012). Given that private equity fund performance is measured as an annual national average in this research, similarly, fund size is also measured as an annual national average. This variable is calculated by summing up fund sizes of firms in a specific country and dividing by the total number of private equity funds. Fund size is expressed in million dollars.

$$Fundsize = \frac{\sum \text{of PE fundsize per country}}{\text{Total number of liquidated PE funds}} \quad (2)$$

**Year dummies.** To perform a regression analysis per year I have created year dummies. By adding year dummies, I can control for certain trends and time specific effects. Besides, adding year dummies enables me to compare the specific effects of different years on private equity fund performance. I have added a year dummy for each year in my data set. Year dummies are binary variables, which take a value of 0 or 1 depending on which year is analysed.

### 3.2 Descriptive statistics

Descriptive statistics and a correlation matrix are included, in order to provide a comprehensive analysis of the variables used in this research. The descriptive statistics, presented in Table 1, provide a summary of the key features of the variables, including measures such as mean, standard deviation, and the range of the variables.

**Table 1**

*Descriptive statistics*

	Mean	Standard deviation	Min	Max
Fund performance IRR%	17.95	6.99	0	32
Culture (IND)	58.73	18.00	27	91
Culture (UAI)	71.96	21.80	23	100
Regulation	7.73	0.33	7	8
Inflation	1.67	1.53	-3	8
Economic growth	1.57	3.51	-11	24
Fund size	608.94	305.39	17	1256
Observations	297			

Furthermore, the correlation matrix, displayed in Table 2, shows the correlation between two variables in my dataset. It illustrates the strength and direction of associations, helping to identify patterns or dependencies. By examining the correlation coefficients, it becomes possible to detect the degree of linear relationship between variables. In Table 2, the correlation matrix reveals that none of the variables exhibit a correlation higher than 0.7, which is highly desirable.

**Table 2**

*Correlation matrix of variables*

Variables	1	2	3	4	5	6	7
1. Fund performance IRR%	1.00						
2. Culture (IND)	0.26	1.00					
3. Culture (UAI)	-0.48	-0.53	1.00				
4. Regulation	0.27	0.53	-0.66	1.00			
5. Inflation	-0.12	0.02	0.01	0.18	1.00		
6. Economic growth	-0.05	0.12	-0.16	0.35	0.24	1.00	
7. Fund size	0.35	0.36	-0.35	0.28	-0.24	-0.04	1.00

## CHAPTER 4 Method.

### 4.1 Analysis

Whereas the previous chapter provided a comprehensive overview on the data collection and sample, this chapter will focus on performing analyses to answer my hypothesis stated in Chapter 2. Considering the structure of my data set, which exhibits measurements from the same set of data over a certain period, I will conduct a panel study. To verify if I should use fixed- or random effects models, I have performed a Hausman test shown in Appendix A. This test is designed to examine whether the unobserved individual effects are properly accounted for (Amini et al., 2012). The Hausman test resulted in a negative Chi-squared, this revealed that the most suitable model for my data was the random effects model. According to this I have built four different regression models, which will be used in this analysis. Model 1 is a base model concerning only my dependent variable (fund performance) and independent variables (individualism, uncertainty avoidance and regulation).

$$\text{Model 1: FundperformanceIRR}_{i,t} = \beta_0 + \beta_1 \text{CultureIND}_{i,t} + \beta_2 \text{CultureUAI}_{i,t} + \beta_3 \text{Regulation}_{i,t} + \varepsilon_{i,t} \quad (3)$$

My second model is an extension to Model 1, including my first control variable inflation. I separately added my control variables in each model to emphasize the effect of each individual control variable. In Model 3 I have added my second control variable economic growth and finally in Model 4 I have added my last control variable fund size. The regression models including my control variables are shown below. All regression models are random effects GLS regressions with clustered standard errors for countries. Clustering standard errors at country level enhances the reliability and validity of my results. The different models including different control variables are presented below:

$$\text{Model 2: FundperformanceIRR}_{i,t} = \beta_0 + \beta_1 \text{CultureIND}_{i,t} + \beta_2 \text{CultureUAI}_{i,t} + \beta_3 \text{Regulation}_{i,t} + \beta_4 \text{Inflation}_{i,t} + \varepsilon_{i,t} \quad (4)$$

$$\text{Model 3: FundperformanceIRR}_{i,t} = \beta_0 + \beta_1 \text{CultureIND}_{i,t} + \beta_2 \text{CultureUAI}_{i,t} + \beta_3 \text{Regulation}_{i,t} + \beta_4 \text{Inflation}_{i,t} + \beta_5 \text{Economic Growth}_{i,t} + \varepsilon_{i,t} \quad (5)$$

$$\text{Model 4: FundperformanceIRR}_{i,t} = \beta_0 + \beta_1 \text{CultureIND}_{i,t} + \beta_2 \text{CultureUAI}_{i,t} + \beta_3 \text{Regulation}_{i,t} + \beta_4 \text{Inflation}_{i,t} + \beta_5 \text{Economic Growth}_{i,t} + \beta_6 \text{Fundsize}_{i,t} + \varepsilon_{i,t} \quad (6)$$

To verify for the individual effects per year, I have added an additional regression model which contains a multivariate regression per year included in my dataset. This additional regression will control for time fixed effects. Model 5 shown in the equation below presents the multivariate regression model:

$$\text{Model 5: } \text{FundperformanceIRR}_i = \beta_0 + \beta_1 \text{CultureIND}_i + \beta_2 \text{CultureUAI}_i + \beta_3 \text{Regulation}_i + \beta_4 \text{Inflation}_i + \beta_5 \text{Economic Growth}_i + \beta_7 \text{Fundsize}_i + \beta_8 i \cdot \text{Year}_i + \varepsilon_i \quad (7)$$

## CHAPTER 5 Results & Discussion

### 5.1 Private equity fund performance analysis

In the following chapter the results, obtained from the regression models mentioned in Chapter 4, will be discussed. To test hypotheses 1, 2 and 3 a random effects GLS (Generalized Least Squares) regression was performed. By executing the Hausman test, outcome reported in Appendix A, it became evident to use a random effects model for my regressions. The random effects model accounts for both individual specific effects and correlation between observations. In a standard OLS (Ordinary Least Squares) regression, the errors are assumed to be uncorrelated and have constant variances (homoscedasticity). However, in a panel data or time series analysis the variances of error terms can vary. Besides, the error terms of different variables could be correlated. Using GLS regression solves this problem by estimating the regressions coefficients using a weighted least squares method. The GLS approach is commonly used in panel data regressions to take violations of OLS regression into consideration. Furthermore, clustered standard errors are used in all regression models. In my analysis I have clustered the standard errors at country level. The reason for clustering standard errors at country level is to account for heteroscedasticity because certain observations within one country are expected to be more correlated with each other than with observations in other countries.

The results of the random effects GLS regression are presented below in Table 3, testing hypotheses 1, 2 and 3. The findings are to be interpreted as the average effect of the independent variables on fund performance (dependent variable). Since, the dependent variable is measured in percentages and the independent variables are measured in units, the coefficients of the independent variables can be interpreted as changes in percentage points. When the independent variables change by 1 the dependent variable changes in percentage points with the value of the independent's coefficient.

In the different regression models, I have added one control variable at the time to properly observe the effect of each individual control variable. In Table 1 the p-values, which indicate the significance of the effect of the independent variables, are presented by stars. In Model 1, the base model without control variables, the independent variables individualism (IND) and regulation do not have a significant effect on fund performance ( $p > 0.05$ ). On the contrary the independent variable uncertainty avoidance (UAI) is highly significant and has a negative effect on fund performance ( $p < 0.05$ ). This entails when uncertainty avoidance rises with one unit, fund performance measured in percentages will decrease with 0.16 percentage points. By adding the first control variable inflation in Model 2, the sign and significance of uncertainty avoidance does not change. Again, by adding the second control variable economic growth in Model 3, the sign and significance of uncertainty avoidance remain the same. Thus, adding inflation and economic growth didn't change the significance of my independent variables, which entails a robust effect of the independent variables on fund performance. However,

by adding economic growth as a control variable the betas of my independent variables all shrunk. This typically indicates that this control variable explains a part of the variance, which was earlier attributed to the independent variables. This means that economic growth also has an explanatory power on fund performance and explains part of the influence that the independent variables have on fund performance. When the third control variable fund size is added in Model 4 the significance of uncertainty avoidance decreased. This suggest that a portion of the effect of uncertainty avoidance is explained by fund size. Adding fund size to my regression models reduces the direct impact of uncertainty avoidance on fund performance. As shown below in Table 3 the variation in fund performance explained by the independent variables differs between 0.21 and 0.27 illustrated by the R-squared. This suggests that individualism, uncertainty avoidance, regulation and the control variables explain 21%-27% of the variability in private equity fund performance.

**Table 3**

*Results of a Random effects Generalized Least Squares regression with random effects for the fund performance analysis*

	<b>Hypothesis</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
Culture (IND)	1	0.04 (0.11)	0.04 (0.11)	0.03 (0.11)	0.07 (0.12)
Culture (UAI)	2	-0.16*** (0.06)	-0.16*** (0.06)	-0.15*** (0.06)	-0.18** (0.08)
Regulation	3	-2.22 (2.53)	-2.11 (2.50)	-0.62 (3.52)	0.15 (3.16)
Inflation			0.10 (0.18)	0.13 (0.18)	0.17 (0.16)
Economic growth				-0.12 (0.11)	-0.10 (0.08)
Fund size					-0.01*** (0.00)
Constant		43.02* (23.47)	42.16* (23.34)	30.65 (30.40)	30.10 (27.74)
$R^2$		0.22	0.21	0.23	0.27

Observations N=211, Clustered standard errors appear in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### **5.1.1 Interpreting control variables**

Inflation, measured in percentages of GDP deflation, is the first control variable added to the base model in Model 2. Based on the results inflation has a positive relation with fund performance. Based on multiple papers, I expected to find a negative relation between inflation and fund performance

(Endri, 2021 & Lucas et al., 2019). The second control variable added to my base model in Model 3 is economic growth, measured as a percentage of annual GDP growth. The results in Table 3 show that economic growth exhibits a negative relationship with fund performance. This is again against my expectations. In line with past research, I expected economic growth to have a positive impact on fund performance. There are multiple reasons to believe economic growth enhances private equity fund performance. Foremost, economic growth and development equals better financial education and financial competences. Second, developed countries attract more human capital and have a much higher level of technology in comparison to developing countries (Nguyen & Nguyen, 2019 & Asal, 2016). Fund size, the third control variable added to my base model in Model 5 has an inconsistent relation to fund performance according to prior research. Kaplan and Strömberg (2009) found that fund size has a negative effect on private equity fund performance. However, according to Lopez-de-Silanes et al. (2015) fund size has no effect on private equity fund performance. Due to the uncertain effect of fund performance, the negative effect of 0.01 on fund performance was no surprise.

### ***5.1.2 Hypotheses private equity fund performance***

Based on the performed panel data analysis Hypothesis 1, which stated that a higher level of individualism in a society would negatively impact fund performance, has no statistically significant relation with fund performance. The results stated in Table 3 show an overall positive effect of individualism on fund performance also when more control variables are added. Due to the absence of a significant relationship of individualism with fund performance, I cannot draw definitive conclusions based on the available information.

After analyzing the results, I can conclude that Hypothesis 2 is accepted, which claims that a higher level of uncertainty avoidance within a country has a negative effect on fund performance. Based on the results of the random effects GLS regressions the coefficient of uncertainty avoidance has a negative significant effect on fund performance of 0.16 in the base model. Although the size of the effect differs and the significance varies between  $p < 0.01$  and  $p < 0.05$  by adding the control variables, the effect remains significant.

In conclusion, Hypothesis 3 which stated that a greater governmental regulation on international trade positively affects fund performance. The results presented in Table 3 display a negative, insignificant effect of governmental regulation on fund performance through models 1, 2 and 3. Only in Model 4 when the control variable fund size is added the sign changes and becomes positive. None of the results in my analysis for regulation are statistically significant, therefore there is no evidence to support a relation with fund performance.



## 5.2 Robustness analysis

In order to assess the reliability and validity of my results I will perform robustness checks. In this study I implement alternative model specifications to validate the findings regarding private equity fund performance, culture, and regulation. By conducting robustness checks I wish to strengthen the overall credibility of my research.

### 5.2.1 Additional variables

First, I have introduced additional variables from Hofstede's cultural dimensions to my original model, in order to examine their impact on the results. To conduct my first robustness check shown in Model 5, I have added cultural dimensions masculinity (MAS) and power distance (PDI) to Model 4. This step will enhance the robustness of my model and the validity of my results. The results of my regressions and robustness analysis are presented below in Table 4.

**Table 4**

*Results of robustness check for the fund performance analysis*

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
Culture (IND)	0.04 (0.11)	0.04 (0.11)	0.03 (0.11)	0.07 (0.12)	0.07 (0.11)
Culture (UAI)	-0.16*** (0.06)	-0.16*** (0.06)	-0.15*** (0.06)	-0.18** (0.08)	-0.13** (0.06)
Regulation	-2.22 (2.53)	-2.11 (2.50)	-0.62 (3.52)	0.15 (3.16)	-0.18 (3.22)
Inflation		0.10 (0.18)	0.13 (0.18)	0.17 (0.16)	0.17 (0.16)
Economic growth			-0.12 (0.11)	-0.10 (0.08)	-0.08 (0.08)
Fund size				-0.01*** (0.00)	-0.01*** (0.00)
<b>Culture (MAS)</b>					-0.04 (0.07)
<b>Culture (PDI)</b>					-0.06 (0.06)
Constant	43.02* (23.47)	42.16* (23.34)	30.65 (30.40)	30.10 (27.74)	34.52 (27.44)
$R^2$	0.22	0.21	0.23	0.27	0.27

Observations N=211, Clustered standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

By adding two more cultural dimensions as control variables, I have tested the robustness of my regression model. The results of my robustness check presented in Model 5 remain similar to the results of Model 4. Uncertainty avoidance had a significant effect on fund performance under the random effects GLS regression and stays significant ( $p < 0.05$ ) when performing the robustness analysis. Besides, the level variability in fund performance explained by the model remains unchanged shown by the R-squared of 0.27 in both Model 4 and Model 5. However, adding the new control

variables did change the sign of the coefficient of regulation. This indicates that regulation might not have a stable association with fund performance. Overall, performing the robustness check did not change the significance of my results, thus this could imply that my regression model is not sensitive for model changes.

### ***5.2.2 Time effects analysis***

In Table 5 the results of my second alternative model specification are shown. My second robustness check is a multivariate regression model per year. I have added an extra regression per year to my panel regression to capture time specific effects, for example certain trends or economic shocks. For the research in this paper, it has been assumed that culture has not changed between 2010 and 2020. Therefore, it is not meaningful to interpret the results of individualism and uncertainty avoidance as they are similar for each year. Unfortunately, uncertainty avoidance is the only independent variable which possesses a significant relationship with fund performance in this model. However, in line with the results of the panel regression the cultural dimension uncertainty avoidance has a negative effect on fund performance. The impact of regulation does change over time varying from -1.22 to -0.29, this can be explained by policy changes. The variation in the effect of governmental regulation also highlights the importance of policy effectiveness.

**Table 5***Results of multivariate regression analysis per year*

	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
Culture (IND)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)
Culture (UAI)	-0.15*** (0.02)	-0.15*** (0.02)	-0.15*** (0.02)	-0.15*** (0.02)	-0.14*** (0.02)	-0.15*** (0.02)	-0.15*** (0.02)	-0.15*** (0.02)	-0.15*** (0.02)	-0.15*** (0.02)	-0.15*** (0.03)
Regulation	-0.84 (1.94)	-0.89 (1.90)	-0.69 (1.92)	-0.67 (1.92)	-0.29 (1.91)	-0.74 (1.91)	-0.63 (1.92)	-0.98 (1.90)	-0.78 (1.91)	-0.79 (1.92)	-1.22 (1.96)
Inflation	-0.40 (0.34)	-0.41 (0.34)	-0.39 (0.34)	-0.36 (0.34)	-0.45 (0.34)	-0.39 (0.34)	-0.43 (0.35)	-0.35 (0.34)	-0.42 (0.34)	-0.41 (0.34)	-0.27 (0.35)
Economic growth	-0.28** (0.13)	-0.28** (0.13)	-0.28** (0.13)	-0.28** (0.13)	-0.28** (0.13)	-0.32** (0.14)	-0.29** (0.13)	-0.34** (0.13)	-0.31** (0.13)	-0.30** (0.13)	-0.41** (0.17)
Fund size	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.00*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
Constant	34.34** (15.78)	34.71** (15.48)	33.10** (15.64)	32.86** (15.63)	30.16* (15.57)	33.66** (15.62)	32.77** (15.66)	35.29** (15.47)	33.76** (15.62)	33.86** (15.68)	38.20** (16.17)
$R^2$	0.31	0.32	0.31	0.31	0.32	0.31	0.31	0.32	0.31	0.31	0.31
Adjusted $R^2$	0.28	0.30	0.28	0.28	0.30	0.29	0.28	0.30	0.29	0.28	0.29

Observations N=211, Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### 5.3 Discussion

In the preceding sections the results of my regression analysis have been used to portray the cultural and regulatory effect on fund performance. Besides, they have been used to answer the hypotheses stated in Chapter 2. In the following section the findings will be thoroughly discussed and compared to prior research. The discussion will be organised per hypothesis.

*Hypothesis 1: A higher level of the cultural dimension Individualism is negatively associated with private equity fund performance.*

Based on the results of the performed random effects GLS regression individualism did not significantly impact fund performance. This could be due to a too small sample size. As shown in Table 3 the coefficient (0.07) of individualism is positive, although rather small this could imply a positive relation with fund performance. In light of the insignificant result, caution must be exercised in drawing conclusions. Compared to previous literature the possible positive correlation between individualism and fund performance is contradicting. According to Lerner et al., 2011 a higher level of individualism within a society could negatively impact fund performance. In contrast there exists research which argues that individualism has a big positive effect on capital allocation (Espahbodi & Dahlman, 2023). The small positive effect my research has shown, could be due to only examining buyout funds and neglecting other forms of capital allocation.

*Hypothesis 2: A higher level of the cultural dimension Uncertainty avoidance is negatively related to private equity fund performance.*

The cultural dimension uncertainty avoidance has shown a negative significant relation to private equity fund performance in my research. When adding different control variables, during the robustness check, the effect of uncertainty avoidance remained significant. In line with my expectations uncertainty avoidance negatively impacts fund performance. Societies with a higher level of uncertainty avoidance prefer clear rules, have a lower risk tolerance, and often rely on traditions. Thus, the results show societies with a higher level of uncertainty avoidance could showcase a lower level of fund performance. Nevertheless, this may not always be the case as fund performance is influenced by many factors such as economic conditions and financial skills. In comparison to prior research, it is evident that uncertainty avoidance has a significant effect on investment decisions and potentially on fund performance. As examined by Amirhosseini & Okere, 2012 and Howcroft et al. (2003) they also present a negative significant effect of uncertainty avoidance on investment decisions which affect private equity fund performance.

*Hypothesis 3: Greater governmental regulation on international trading positively affects private equity fund performance.*

Based on the results of my regression governmental regulation is ought to have a negative effect on fund performance. As well as individualism, regulation does not show a significant relation with private equity fund performance. This could be explained by the sample size being too small or a different indicator for regulation which suits the data better. In this paper regulation is referred to as the level of economic freedom in a country, this indicator for regulation contains legislation on property rights, the size of a government, and the ability to trade internationally. The negative relation between regulation and fund performance could imply that a country with more legislation and greater government interference has a lower level of fund performance. This result is contradicting with existing literature. Opposite findings suggest that in countries with a higher level of regulation and better legal structures the probability of a successful private equity fund is higher (Johan & Zhang, 2016). However, consistent with my results, Cumming and Zambelli (2013) state that extreme regulation leads to inefficiency, which is associated with a lower level of fund performance. The results of contradicting research could be due to different indicators of governmental regulation.

## **CHAPTER 6 Conclusion & limitations**

In this research I examined the relationship between culture, regulation, and private equity fund performance. I have defined culture by using Hofstede's cultural dimensions. Previous research has shown different points of view regarding the cultural and regulatory effect on fund performance. Most prior literature is focused on hedge funds, with no specific study solely dedicated to private equity funds. Although, fund managers could be influenced by cultural characteristics which could influence the overall private equity fund performance. Therefore, the focal point of this study is the following research question: *How will cultural differences and regulation affect the fund performance for private equity funds in Europe compared to private equity funds in North America?*

Collecting data on fund performance, cultural differences, regulatory regimes, and economic factors allowed me to explore the relationship with fund performance and answer the research question. Data collection resulted in a sample of 211 observations across all European countries and the United States during 2010-2020. After conducting panel data regressions, multivariate regressions, and robustness checks I have found a significant relationship between the cultural dimension uncertainty avoidance and private equity fund performance. Unfortunately, my analysis pointed out there is no significant effect of regulation and the cultural dimension individualism.

All things considered; I can conclude private equity fund performance is negatively influenced by the cultural dimension uncertainty avoidance. As a result, countries with a higher level of uncertainty avoidance tend to exhibit a worse national fund performance. However, one should still exercise caution in drawing conclusions as fund performance is also influenced by various other economic factors.

### **6.1 Limitations**

In the following section I will provide an overview of the limitations to this study. The purpose of discussing the limitations in my paper is to identify and discuss the potential weaknesses of my research. Initially, my data sample consisted of 211 observations, this is a rather small sample which could affect the representativeness of my research. Besides, I have looked at national averages and only considered buyout funds in my data collection. To enlarge the sample size and improve the validity of my results, further research could consider an analysis on fund level instead of country level.

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# APPENDIX A Hausman test

*Results of Hausman test*

	(b) Random	(B) Fixed	(b-B) Difference	Standard error
Regulation	0.15	0.29	-0.15	0.00
Inflation	0.17	0.25	-0.08	0.06
Economic growth	-0.10	-0.07	-0.02	0.02
Fundsize	-0.01	-0.01	0.00	0.00

b= Consistent under H0 and Ha, B= Inconsistent under Ha, efficient under H0

$$\chi^2 = -437.92$$