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Exploring the Causal Link between Early Life Experiences and Risk-Taking Behavior: Evidence from Venture Capitalists

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Abstract

This master thesis examines the causal relationship between early-life exposure to natural disasters and risk-taking behavior among venture capital investors. Drawing on a comprehensive literature review, we define specific risk-taking measures and analyze a dataset comprising 894 VC investors and their involvement in 1.6 million total deals. Through rigorous statistical analysis, we explore the impact of experiencing natural disasters during one's formative years on VC investors' risk-taking behavior. Our findings reveal a U-shaped relationship, similar to previous studies on CEOs, suggesting that moderate levels of disaster exposure led to increased risk-taking, while extreme levels result in a more cautious approach. Moreover, an extended analysis employing continuous measurements of early-life experiences establishes a causal link between VC investors' exposure to injuries from natural disasters during their early life and their propensity for making late-stage investments. This novel insight is underpinned by robustness tests, control variables, and fixed effects, highlighting that injuries from natural disasters serve as an exogenous shock affecting VC investment timing. Though the degree of statistical significance may differ from existing literature, this thesis contributes to the understanding of financial behavior and sets the stage for future research, especially regarding the uncovered relationship between early-life injuries from natural disasters and late-stage investments. The insights gained from this study have practical implications for VC investors, providing valuable perspectives into their decision-making process, and enhancing our understanding of risk-taking dynamics in the venture capital industry.

Acknowledgement

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This journey has been both challenging and rewarding, and we are grateful for the academic and personal growth we have experienced. Our sincerest thanks to all who contributed to this unforgettable journey.

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List of Abbreviations

VC - Venture Capital

PE - Private Equity

AUM - Assets Under Management

IPO - Initial Public Offering

PB - Pitchbook

LP - Limited Partners

1. Introduction

The venture capital market has emerged as a crucial avenue for investments in startup companies, attracting investors who are actively seeking opportunities to disrupt and revolutionize entire markets. In an era characterized by rapid technological advancements and innovation, there has been a significant increase in the number of startups seeking funding from venture capitalists. These investors not only provide vital financial support but also offer valuable expertise and connections that contribute to the growth and success of these companies. The potential for high returns on investment serves as a major incentive for venture capitalists, who willingly undertake the associated risks involved in investing in early-stage companies.

The propensity for risk-taking in the realm of investing and venture capital can be profoundly influenced by an individual's early life experiences. Psychological research suggests that factors such as childhood upbringing and environmental circumstances can shape an individual's risk preferences and decision-making processes regarding investing (Cheong et al. 2021). Understanding the impact of early life experiences on risk attitudes is of utmost importance, as it allows investors and venture capitalists to contextualize risk-taking behaviors and tailor investment strategies accordingly. This, in turn, leads to more effective decision-making and improved outcomes within the dynamic and unpredictable landscape of finance and entrepreneurship. Thus, our research aims to explore the influence of early life experiences, specifically natural disasters, on the risk-taking behavior of venture capitalists. Hence, the research question we propose is as follows:

"What is the effect of exposure to natural disasters during a venture capitalist's formative years on their risk-taking behavior?"

Our research draws inspiration from previous studies that have explored the relationship between early-life experiences and risk-taking behavior in different contexts. One such study is "*What Doesn't Kill You Will Only Make You More Risk-Loving: Early-Life Disasters and CEO Behavior*" by Bernile et al. (2017), which investigates the impact of natural disasters experienced during CEOs' formative years on their risk-taking behavior, finding evidence of an effect on

risk-taking. Additionally, research conducted by Malmendier et al. (2011) and Chen et al. (2021) has established a connection between CEOs' risk-taking behavior in corporate leadership and their early-life experiences.

The study aims to explore the relationship between risk-taking propensity and the impact of natural disasters on investors. Specifically, we seek to investigate if individuals with a higher inclination for risk are more significantly affected by natural disasters due to their inherent risk-taking nature. To focus our research, we have chosen venture capital investors as a specific group involved in high-risk investing. Venture capital is known for its characteristic structure of high risk and potential for substantial rewards, aligning with our interest in examining the impact of natural disasters on investors engaged in ventures associated with elevated levels of risk. Additionally, venture capital investments are associated with higher expected returns due to factors like smaller market capitalization and lower valuation, primarily driven by increased investment risk. This further justifies our selection of venture capital as it primarily focuses on early-stage companies with little to no established value (Ruhnka & Young, 1991; Fama & French, 1993, 2015).

Our findings indicate that, we cannot find support for our hypothesis, and that contrary to the results obtained by Bernile et al. (2017) with respect to CEOs, there is no statistically significant relationship between venture capitalists' early life experiences with natural disasters and their risk-taking behavior. Our analysis encompassed various measures of risk-taking, such as syndication, staging, and late-stage investment decisions, and despite thorough examination, none of these dimensions showed a significant association with early-life experiences of natural disasters. However, our results did reveal a significant negative relationship between age and syndication, indicating that younger venture capitalists with less experience are more likely to engage in syndication. This finding aligns with prior research by Ferrary (2010), reinforcing the notion that syndication serves as a mechanism for younger venture capitalists to mitigate information asymmetry and manage risks by leveraging the expertise of others. Our study’s lack of significant findings concerning the impact of early-life experiences on risk-taking behavior highlights the complexity of this relationship within the venture capital industry and calls for further exploration.

2. Literature Review

The present literature review is structured into distinct sub-categories, aimed at providing a comprehensive empirical framework to address the research question at hand. The initial section encompasses an exploration of early life experiences, accompanied by the establishment of a foundational hypothesis. Subsequently, the second section delves into an examination of the venture capital market and explores the reasoning behind the choice of VCs. As well as defining and analyzing various investment stages. Lastly, the concluding section explores the notion of risk and explores diverse measures utilized to characterize risk-taking behavior among venture capitalists.

2.1 Early-Life Experiences

The hypothesis we propose takes partial inspiration from the research paper by Bernile, Bhagwat, and Rau titled "*What Doesn't Kill You Will Only Make You More Risk-Loving: Early-Life Disasters and CEO Behavior*" as a fundamental basis. This study aims to investigate the influence of natural disasters experienced during CEOs' adolescent years on their subsequent inclination towards risk-taking.

To achieve this objective, the authors utilize data on natural disasters that occurred in the United States during CEOs' childhood and adolescent periods. Specifically, they examine the occurrence of such disasters in the counties where CEOs grew up between the ages of 5 and 15. The researchers construct variables to capture the CEOs' exposure to fatalities, categorized as "extreme fatality experience," "medium fatality experience," and "no fatality experience."

While the authors primarily focus on fatality rates, they also consider indicators such as economic damage and crop damage. It is important to note that their analysis covers the period from 1900 to 2010, encompassing a substantial timeframe.

The study reveals compelling evidence indicating a non-linear relationship between the severity of natural disasters and CEOs' risk-taking behavior. Specifically, the researchers observe a nonmonotonic association between CEOs'

exposure to natural disasters and their propensity for engaging in risky corporate decision-making. CEOs who had a moderate level of exposure to fatalities resulting from natural disasters exhibited a greater inclination towards adopting risky corporate policies. For instance, when accounting for other relevant factors, firms led by CEOs with moderate fatality experience maintained, on average, 1.2% less cash reserves per unit of total assets compared to firms headed by CEOs with no-fatality experience.

Conversely, the study also finds that CEOs who experienced extreme fatality disasters demonstrated a reduced likelihood of embracing risk-associated policies. Consequently, the findings depict an "inverse U-shape" pattern, with CEOs having a moderate degree of fatality disaster experience occupying the highest position on the risk-taking spectrum, while CEOs with no-fatality and extreme fatality experiences occupy the lower ends.

The findings of this study hold particular significance for our research, as they contribute to our understanding of the potential impact of early-life disaster experiences on risk-taking behavior. The results align with prior research on the psychological effects of traumatic events, suggesting that individuals who have endured trauma may exhibit a higher tolerance for risk. This implies that early-life disasters can have lasting implications for an individual's attitudes and behaviors related to risk-taking.

The work by Bernile et al. (2017) expands the existing body of knowledge concerning the link between a CEO's personal experiences and their propensity for risk-taking. By demonstrating that early-life disaster experiences can influence decision-making and behavior, the study supports the premise of our hypothesis, namely that early-life disaster experiences may impact the risk-taking behavior of venture capitalists.

Within the realm of financial decision-making and its connection to individuals' early-life experiences, this literature review examines various academic journals, including the works by Malmendier, Tate, and Yan (2011) and Malmendier and Nagel (2011). These articles contribute significantly to the understanding of how

personal backgrounds and historical contexts shape financial policies and risk attitudes among decision-makers in both corporate and individual settings.

The article authored by Malmendier, Tate, and Yan (2011), titled "*Overconfidence and Early-Life Experiences: The Effect of Managerial Traits on Corporate Financial Policies*", focuses on examining the impact of overconfident managers who perceive their companies as undervalued and hold the belief that external financing is overpriced. The study reveals that such executives exhibit a diminished reliance on external financing and a decreased propensity to issue equity compared to their counterparts. Moreover, the researchers delve deeper into the influence of managers' personal histories on their financial decision-making processes. Drawing upon existing evidence that suggests individuals are particularly influenced by significant events early in life, the authors identify two formative experiences: growing up during the Great Depression and serving in the military.

Furthermore, the authors make a noteworthy observation regarding CEOs who experienced the Great Depression, as they tend to exhibit a higher degree of risk aversion, relying primarily on internal financing while exhibiting a reluctance towards public markets. Additionally, the study examines another group of CEOs with a military background, who demonstrate a more assertive approach in their financial policies, including a heightened inclination towards leverage. Particularly noteworthy is the finding that CEOs who served in World War II display significantly higher market leverage ratios within the same firm compared to both their predecessors and successors. This finding holds particular significance as it takes into account the fact that these individuals were drafted into service, thereby mitigating concerns related to self-selection bias.

In an effort to expand the investigation into the relationship between personal experiences and financial decision-making, Malmendier and Nagel (2011) contribute a notable article published in The Quarterly Journal of Economics. Their research explores whether individuals who have encountered low real stock market returns throughout their lives are less inclined to undertake financial risks. The findings indicate that individuals who have suffered substantial losses from risky investments exhibit a reduced willingness to engage in financial risk-taking

in the future. Conversely, those who have experienced high investment returns demonstrate an increased appetite for financial risks. Additionally, the authors emphasize that individuals tend to place greater significance on recent investments as compared to past ones, implying that prior experiences do influence current investment decisions.

These articles not only address significant gaps in the literature but also provide valuable insights into the psychological and behavioral aspects that underlie financial decision-making. By examining the influence of early-life experiences, such as economic downturns and military service, on managerial traits, risk attitudes, and financial policies, these studies contribute to a comprehensive understanding of the multifaceted factors that shape financial decision-making processes in various contexts. Therefore, these articles establish a solid foundation for subsequent analyses and discussions in the overall literature review.

Drawing upon the works of Malmendier et al. (2011) and Bernile et al. (2017), Cheong, Tan, and Zurbruegg (2021) conducted a comprehensive investigation into the influence of risk-relevant childhood experiences on individuals' risk preferences in trading. By closely examining the trading behavior of participants within a simulated asset market, the researchers identified several key factors that affect individuals' inclination to engage in trading activities. Specifically, they found that experiencing a significant family financial loss during childhood, the source of parents' income, the strictness of upbringing, and birth order all play a significant role in shaping individuals' risk preferences. These valuable findings contribute to the existing body of literature by highlighting the critical role of early-life experiences in shaping adults' financial risk preferences.

Within the realm of trading, the study's findings demonstrate that individuals who have encountered a major family financial loss during childhood tend to exhibit reduced willingness to engage in trading activities. Moreover, the source of parents' income, particularly when it is derived from salaried employment, is associated with lower levels of trading activity. Additionally, the study reveals that individuals who have experienced less authoritarian parenting styles are more likely to have risk-averse preferences in trading. Furthermore, birth order also

emerges as a noteworthy factor, with individuals who are not the first-born displaying decreased risk preferences in trading (Cheong et al., 2021).

In summary, the research paper by Cheong et al. (2021) contributes to a deeper understanding of how risk-relevant childhood experiences shape individuals' risk preferences within the trading domain. By shedding light on the significance of early-life experiences in shaping adults' financial decision-making and risk attitudes, these findings add to the growing body of literature in this field. Importantly, this article reinforces the empirical support for our thesis by establishing a strong link between early-life experiences and financial risk-taking decisions.

O'Sullivan, Zolotoy and Fan (2021) also built upon the findings of Bernile et al (2017) in their article, which explores the consequences of traumatic experiences during adolescence on CEOs and their subsequent influence on corporate social performance. The authors investigate how these experiences shape CEO cognition and values, thereby impacting firm behavior. Drawing upon concepts such as bounded rationality and upper echelons theory, the researchers argue that CEOs interpret situations through a personalized lens molded by their individual experiences and values. The study underscores the significance of these experiences, which manifest in both company performance and outcomes.

Furthermore, the authors draw upon psychological studies to underscore the importance of traumatic early-life experiences in relation to other experiences. They reference studies indicating that individuals who have undergone natural disasters tend to exhibit stronger interpersonal relationships and a more positive attitude towards the well-being of others. Using this knowledge as a foundation, the researchers utilize natural disasters as an independent variable in their study, focusing specifically on the United States and examining cases where such disasters occurred in the county where the CEO resided between the ages of five and fifteen.

The study revealed that the CEO's early-life experiences, as well as stakeholder perceptions of both the firm and the CEO, exert a significant influence on corporate social performance. Additionally, the study unveils that the younger the

CEO was at the time of the disaster, the more profound its impact on decision-making. These findings provide compelling evidence supporting the critical role of natural disasters and early-life experiences in shaping the decision-making processes of organizational leaders.

In their 2021 publication in the Journal of Corporate Finance, Chen et al. (2021) explored the impact of early life disaster experiences on risk-taking behavior, specifically focusing on the relationship between such experiences and stock price crash risk. Building upon the work of Bernile et al. (2017), the authors aimed to extend existing knowledge by examining the effects of disaster experiences in adolescence on CEOs' decision-making around stock price crash risk, within the context of US-based Fortune 500 companies.

The results indicate that companies led by CEOs who have encountered natural disasters tend to exhibit higher levels of stock price crash risk on average. Furthermore, the researchers discovered that this risk is further amplified when CEOs possess greater incentives for equity risk-taking, particularly when they also serve as board members in addition to being the CEO. This intensified effect is primarily observed because the financial rewards of these CEOs are directly tied to the equity performance of their respective companies.

In addition to the increased crash risk, the study also reveals that CEOs with natural disaster experiences tend to lead firms characterized by greater fluctuations or variability in their cash flows and stock returns. This suggests that such companies experience higher levels of volatility in their financial performance over time. Furthermore, similarly to Bernile et al. (2017), they find that the degree of impact on risk-taking behavior is contingent upon the severity of the natural disaster experienced by the CEO. The effect varies based on the extremity of the disaster event.

This article holds significance as it contributes to the empirical research on CEOs' risk-taking behavior, shedding light on the influence of their early-life experiences with natural disasters. Moreover, it suggests that CEOs who demonstrate a heightened interest in their company's performance are more inclined to undertake risks, potentially leading to both positive and negative outcomes.

The aforementioned academic journals, including the works of Bernile et al. (2017), Chen et al. (2021), and O'Sullivan et al. (2021), establish a clear link between CEOs and individuals at the managerial level, highlighting the significant influence of early life experiences. Bernile et al. (2017) and Chen et al. (2021) provide evidence that early life experiences, particularly in the form of natural disasters, not only affect CEOs' decision-making processes but also their willingness to undertake risk at the managerial level. Similarly, O'Sullivan et al. (2021) investigates the effects of natural disasters as early life experiences on managerial traits and find that such experiences have a substantial impact on decision-making processes and the corporate social performance. Moreover, Malmendier et al. (2011) explore the effects of significant life experiences, such as the Great Depression and military service, on managers. Collectively, these studies consistently demonstrate that early life experiences significantly influence decision making and risk-taking behavior. Consequently, it is reasonable to infer that venture capitalists, who specialize in high-risk investments, may also exhibit altered risk-taking tendencies as a result of these experiences.

2.2 Venture Capital

Private equity refers to a form of capital that is sourced from entities outside the public market. Typically, it is directed towards established businesses operating in well-established sectors, with the objective of acquiring equity ownership. The term "private equity" often encompasses four distinct categories: venture capital, growth capital, buy-out capital, and buy-in capital. However, in recent years, the term has been primarily associated with funding provided to late-stage investments, thus differing from the concept of venture capital (Gilligan & Wright, 2020).

Venture capital represents a subset of private equity investments aimed at providing financial resources to startups and businesses with high growth potential. Investment banks, corporations, and affluent individuals typically serve as venture capitalists, assuming the role of financial intermediaries. It is important to note that venture capitalists not only offer financial assistance but also provide

managerial and technical support to the companies they invest in (Chircop et al., 2020; Hayes, 2023).

Venture capital investments primarily target businesses in their early stages, often characterized by limited or no operational history. These fledgling companies secure financing from venture capital firms or individual investors, thereby granting the venture capitalist a share of ownership in the company. Acting on behalf of a company or as individual investors, venture capital providers offer financial backing to entrepreneurs (Baldridge & Curry, 2023).

Another significant term within the realm of venture capital is the concept of "angel investor." Angel investors, who specialize in seed-stage funding, play a crucial role in providing initial capital to nascent businesses. Unlike other lenders, angel investors often provide a single investment aimed at supporting the foundational stages of a business. Entrepreneurs often turn to angel investors due to the more favorable terms they offer. Typically, angel investors are private individuals who meet the Securities and Exchange Commission's criteria of being an "accredited investor," defined as an individual with a net worth exceeding $1 million (Angel Investor Definition and How It Works, 2022).

To address the research question, which aims to examine the relationship between venture capital risk-taking and early life experiences, it is crucial to understand why VC investors were specifically chosen over other types of investors or private equity. Building upon the findings of Bernile et al. (2017) regarding risk-taking, the present study seeks to investigate whether investors with a greater propensity for risk would be more significantly affected by natural disasters due to their inherently risk-loving nature.

Previous research has established that risk is associated with the size and valuation of the investment. The Fama and French three-factor model recognizes that investing in smaller companies carries higher inherent risk, as does investing in companies with lower valuations. VCs focus their investments on companies in their early stages with little to no history and no existing market evaluations. However, similar arguments could also be made for other forms of investment, such as hedge funds or private equity.

Therefore, to further justify the selection of venture capital investors, it is important to recognize that the investment decisions made by VCs are complex, often influenced by a lack of knowledge and quantifiable financial market data. Moreover, the trajectory of these investments can rapidly change in response to market fluctuations, financial cycles, and unforeseen competitors, making venture capital one of the highest risk investment types (Ruhnka & Young, 1991).

Furthermore, venture capital plays a crucial role in fostering innovation and entrepreneurship. By providing capital and expertise to early-stage and high-growth companies, venture capitalists enable the development and commercialization of groundbreaking ideas. This emphasis on supporting innovative ventures aligns with my interest in exploring the dynamics of emerging technologies and their impact on the business landscape.

Additionally, venture capital offers unique investment opportunities with potentially high returns. While hedge funds and traditional private equity may focus on mature businesses or financial markets, venture capital focuses on startups and disruptive technologies. This sector has witnessed remarkable success stories, such as Airbnb and Uber, which have revolutionized their respective industries.

VCs are known to employ multiple strategies and exhibit various behaviors to manage these substantial risk factors (Ruhnka & Young, 1991). Given the intricate nature of VC investments and the multitude of factors influencing VC investment decisions, establishing a behavioral framework for venture capital risk-taking by investigating the link between natural disasters as early life experiences and investors' risk tolerance could provide a significant contribution to the field.

2.3 Stages of VC Investing

Venture capital investment follows a distinct progression of stages, with each stage corresponding to the development phase of the target company. Venture

capitalists may specialize in a particular stage, while others remain agnostic to stage preferences. The primary stages of venture capital investment encompass "Seed Round Funding" "Early-Stage Funding" and "Late-Stage Funding".

Seed Round Funding represents the initial phase of investment, during which venture capitalists provide a smaller capital infusion to support the development of a business plan or product proposal. Essentially, these funds are raised during the nascent stages of the business, often with the objective of securing further funding (Reiff & Mansa, 2023).

Early-Stage funding typically comprises multiple rounds, denoted as A, B, and C funding rounds. At this stage, companies are in a growth phase, and the investment amounts provided are larger compared to the seed round. Early-stage funding encompasses the three rounds preceding an initial public offering (IPO).

The Series A funding round follows the seed stage and is geared towards demonstrating the company's long-term financial growth and profitability potential. Investors seek well-defined strategies and concepts during this round. In 2021, the median series A investment was $15 million, and only approximately 10% of seed-stage startups successfully raise series A funding (Reiff & Mansa, 2023; Fundz, 2023).

Series B funding adheres to similar principles as Series A funding, but it is directed towards more established companies that have made progress in their development. The valuation of these companies typically ranges between $30 million and $60 million (Fundz, 2023). Series C funding aims to facilitate rapid expansion by introducing new products or entering new markets, often achieved through acquisitions (Pitchbook, 2023).

Late-stage funding pertains to funding rounds for companies that have completed their development phase and have demonstrated growth yet remain unprofitable. This stage is further segmented into distinct series, commonly denoted as series D, E, and F, with the potential for additional rounds beyond. Notably, some companies, such as Airbnb, have undergone more than 30 funding rounds by the

end of 2020, exemplifying the extensive nature of late-stage funding (Fundz, 2023).

2.4 Risk

Investment risk is, in the broadest sense, the probability that an investment will result in losses rather than profits. Due to the impossibility of knowing with certainty that an investment will result in a profit, there will always be a risk associated with investing. Moreover, the value of an investment can grow or fall based on a variety of market and business factors. Therefore, investing involves multiple types of risk, such as the ease or difficulty of cashing out an investment which is known as liquidity risk. Investors must also consider concentration risk, which refers to the degree to which their investments are diversified, e.g., holding all of their investments in a single stock. Investors therefore need to consider multiple aspects when investing, and analyzing the investment risk is one of the most important elements of investing (FINRA, 2023).

Risk in venture capital investments distinguishes itself from risk in traded stocks and bonds. While both VC investors and traditional investors share common considerations, VC investments generally entail significantly higher risk compared to other types of investments. This heightened risk can be attributed to several factors. Firstly, VC investments typically demand a considerably higher return on investment to offset the illiquidity inherent in such ventures. Additionally, VC investments are often made in large funding rounds, meaning that an individual investment can account for a substantial portion of an investor's available funds (Cochrane, 2005). Consequently, the concentration of funds in a single investment amplifies the potential risk exposure for VC investors.

Furthermore, as stated by Gilligan and Wright (2020) private equity investments are long-term commitments with a typical timeframe of four to six years. These are irreversible investments in a mostly unknown future opportunity that may or may not turn a profit. Given all the different factors that must be considered, VC investing is complicated and difficult to quantify in its entirety. In fact, Ewens & Rhodes-Kropf (2015) demonstrates that "85% of VC returns come from 10% of

their investments." Not only that, but they show that only 12.8% of VC investments result in IPOs. VC risk is also more complicated than standard investment risk due to the limited amount of information and insight into the business's growth potential. In addition, the VC's time-consuming and difficult job of gathering data about the investment means that there may be a knowledge gap between the investor and the entrepreneur. This creates information asymmetry between VC investors and entrepreneurs, resulting in a significant factor of adverse selection (Chircop et al., 2020; Cumming & Johan, 2008).

In their paper titled "*Does religiosity influence venture capital investment decisions?*" Chirop, Johan, and Tarsalewska delve into the realm of religiosity and their potential impact on the risk-taking behavior of venture capitalists. The primary objective of their study is to investigate whether counties with higher levels of religiosity exhibit varying degrees of risk aversion compared to counties with lower levels of religiosity, particularly in relation to VC investments.

The authors discover a noteworthy correlation between the religiosity of a county and the investment practices of VCs within that region. Specifically, VCs located in more religious counties demonstrate a greater inclination towards syndication and staging strategies, as well as a higher propensity to invest in later rounds, when compared to VCs situated in less religious counties.

Given that religiosity is inherently personal and varies from individual to individual, the researchers employ proxies based on county-level data to approximate the level and nature of religiousness associated with each firm. However, it is important to acknowledge that the use of such proxies introduces the possibility of capturing errors in the study's findings, even though prior research has supported the development of these proxies. Nevertheless, the availability of county-level mortality rates provides valuable support for the generation of relevant data in this research.

This study is particularly significant as it represents one of the first of its kind, with very limited existing research exploring the influence of religiousness on VC investment decisions. Furthermore, the findings align with previous studies that suggest a positive correlation between religiousness and general risk-taking

behavior. Building upon this foundation, the authors demonstrate that VC risk-taking is largely unobservable as a whole. To address this challenge, they rely on established measures that have been shown to be correlated with the extent of VC risk-taking. Consequently, in our own research, we have chosen to adopt the same risk measures employed by Chircop et al. (2020). The key risk measures encompass “Syndication”, “Staging”, and the VC investment round known as "Late-stage".

2.4.1 Syndication

In the context of venture capital and private equity, syndication is the practice of pooling capital from multiple investors to invest in a particular private equity transaction or venture. Venture capitalists can obtain the necessary financial resources to support large acquisitions, buyouts, and other investment opportunities through syndication. There are numerous reasons why syndication is an important aspect of venture capital investing. According to (Brander et al., 2002), 63.6% of all venture capital investments in the United States were completed as syndicated investments in the year 2000. Hence, the majority of investments in entrepreneurial businesses are syndicated. In addition, there is typically a lead investor who invites other investors to participate as passive investors. The lead investor initiates the first funding round and invites other VCs to participate in that round or subsequent ones in the future. Theoretically, it is difficult to comprehend the rationale behind these syndications. There is no definitive answer to the question of why syndication occurs, however, the leading theory is that it is used to diversify risk and enhance project selection and to increase the value of the project with expertise and knowledge (Ferrary, 2010).

In their 2007 Journal of Financial Intermediation article, Casamatta and Haritchabalet attempt to provide a justification for venture capital syndication. The authors explain that syndication makes the screening process more efficient, and knowledge based. The purpose of the study is to determine the costs associated with syndication in relation to investment decisions and to some extent, comprehend why VCs syndicate. One of their claims is that the first investor faces a trade-off since he can rely on his own intuition and data to access the investment and as a result, benefit from the monopoly they hold over said investment. On the

other hand, they can solicit the opinion and knowledge of a second VC in order to obtain more substantial information and insight regarding the investment opportunity. However, they would be required to divide the anticipated returns (Casamatta & Haritchabalet, 2007).

The authors then hypothesize that it is easier for newer investors to seek the opinion of a second VC since they are unable to conduct the necessary screening accurately and efficiently themselves. Therefore, they don't have anything to lose by seeking a second opinion. In addition, they demonstrate that experienced VCs receive no additional value from the syndication and are consequently less inclined to participate. Younger and less-experienced VCs are more likely to participate, given the absence of disadvantages. Casamatta and Haritchabalet conclude that venture capitalists have incentives to syndicate, although these incentives diminish with investor experience (Casamatta & Haritchabalet, 2007).

Brander et al. (2002) also investigated the rationale behind syndication, examining two potential causes for the prevalence of syndication. The reasons they offer as potential solutions are project selection, which Casamatta and Haritchabalet examined in their article, that is; the knowledge and experience that each VC brings to the table. Second, additional VCs bring complementary management skills. The authors find that syndicated venture capital investments have a higher average return than non-syndicated investments. The disparity is so great that there may be indications of selection bias. This is explained by investors' preference to syndicate with investors with a proven track record. Or that the VCs wish to appear favorable by association. The authors conclude that it is difficult to differentiate between the risk-sharing and value-adding hypotheses when testing for risk aversion in syndication. However, they do find evidence that risk sharing can partially explain syndication.

2.4.2 Staging

In venture capital investments, staging serves multiple purposes, with a strong emphasis on risk management. It involves providing funding in stages based on the achievement of milestones or objectives by the startup, as opposed to providing the entire amount at once. Staging can help mitigate agency issues

because it allows venture capitalists to gather more information over time, enabling them to accurately assess the investment's viability. It aligns the interests of the VC and the startup, thereby reducing the risk of adverse selection and moral hazard. Moreover, it provides risk management because venture capitalists limit their exposure and safeguard capital by funding in stages. If a startup fails to meet stage-specific objectives, venture capitalists have the option to cease further investment, limiting their losses and reallocating resources to other projects. As both parties are able to adapt to market and performance-based changes, staging can also provide the company with adaptability and learning opportunities (Chircop et al. 2020; Wang & Zhou, 2004).

The effects of staging may be explained by the fact that both the venture capitalist and the entrepreneur face moral hazards and agency costs. This pertains to the fact that if the investment is difficult to verify, the entrepreneur may misappropriate the funds. Or, if the entrepreneur does not work hard enough or efficiently enough to achieve their goals, the venture capitalist may withdraw from the joint venture. In his study, Gompers (1995) finds that financial staging enables VCs to analyze the situation as it unfolds, allowing them to retain the option to withdraw and limit their losses.

To elaborate on the theoretical background of staging, Wang, and Zhou's 2004 article, which builds on the findings of Gompers (1995), provides a solid foundation for comprehending the significance of this risk-taking measure. The study examines the impact of staged financing in a scenario in which an entrepreneur operates in a flawed capital market and the investor faces moral hazard and uncertainty. There are numerous factors that could lead to problems and increased risk for the investor in a venture capital investment. Throughout this study, the authors demonstrate how effective the use of staged financing is in emerging companies and how numerous projects would have been abandoned without this type of investment.

Despite the fact that this is true, the authors provide evidence that staged financing is not always the best solution for social welfare. This may be due to the nature of staged financing; if a project is underperforming, the investor can easily pull the plug. Which may not have occurred if the project had been funded in advance.

Wang and Zhou test multiple scenarios for the use of staged financing and find that the use of staged financing increases the entrepreneur's efficiency despite the increased moral hazard resulting from the VC's potential withdrawal. In addition, they find that staging significantly reduces risk in later stages of financing and enables high levels of efficiency in promising ventures.

Tian (2011) also investigates Staging and its causes and effect on venture capital financing. The author uses geographical distance to show that the further away the VC is in regard to the entrepreneur, the less the VC normally invests in total, as well as investing smaller amounts for each round. Tian also finds that the survival rate of a startup after going public, is positively affected by the number of rounds, though only if the investor is far away. For our investigation, Tian's study is important, since it underlines a connection between the fact that staging can increase value and strengthen the startups position. This paper is also useful in the way it constructs its variables. Specifically, the "*Staging*" measure he created.

2.4.3 Late-stage

In VC investing the total risk-factor is affected by the investment stage and at which round the investment is made. In general, the earlier rounds result in more risk, with Seed Rounds being the riskiest. This is in large part due to the fact that by investing into the company at a later stage, the VC can solve the problem of adverse selection. Therefore, it was decided to include the risk-taking measure "Late-stage".

Kaplan & Schoar (2005) wrote an article in The Journal of Finance where they investigate the performance and capital inflows of private equity partnerships and compare VC fund investments to S&P 500 returns. They find that weighted VC funds outperform the S&P 500 while buyouts do not. When calculating for differences in risk Kaplan and Schoar divide the PE funds into "*Early stage, Late-stage, Expansion stage, leveraged buyout and mezzanine funds*" In order to investigate whether or not risk was affected over time. The authors claim to find qualitatively and statistically evidence that entering in a later stage will result in less overall risk.

In 2015, Huang and Pearce published an article in Administrative Science Quarterly that examined the early-stage investment decisions of VCs under extreme uncertainty. In this study, Huang and Peace identify uncharacterized attributes in angel investors with the hypothesis that they are able to use their "gut feeling" to accurately predict high returns over a period of four years while risking smaller stakes to find extreme returns. While simultaneously anticipating the loss of their entire investment. Even the most experienced angel investors lose money on over fifty percent of their investments. This article explains the early phases of seed-round investing, where decisions are clouded by uncertainty. Extreme uncertainties can be viewed as unknowable risks, and angel investors face extreme risk because they frequently invest in concepts for markets that do not yet exist.

When these types of VCs invest, Huang and Pearce explain, they must decide to invest in uncertain solutions in uncertain markets with uncertain products and services, which can be described as "chasing an invisible moving target." In their research, they explain that investors are compelled to make do with the knowledge at their disposal because they are unable to collect the necessary data to assess risk. Instead of avoiding these unknown risks, the findings of this study indicate that seed-stage angel investors actively seek them out, which plays a significant role in their investment strategies.

Although the study's hypothesis was to determine whether angel investors can accurately predict venture survival and extreme growth based on their gut feelings, the results did not support this hypothesis. It provides empirical support for our risk measurement "Late-stage."

The next paper, by Cumming and Johan (2008) looks into the role of preplanned exits and the investors strategy of selling the investee company when it reaches IPO status or as an acquisition. The researchers investigate the legal conditions and bargaining powers when it comes to allocation of capital and control rights. Furthermore, this shines a light on the relationship between the investor and the entrepreneur and gives insight into how both parties want to have increased bargaining power and veto rights. This can therefore be a leading factor in the risk of adverse selection since the entrepreneur wants to remain in control. Moreover, the entrepreneur will sometimes make choices in the earlier stages of the company

that are not in the best interest in the long-term. Often it can take years before these choices play out.

2.4.4 AUM and Dry Powder

Assets under management or AUM for short is the term used for the total market value of the managed holdings of an investor or entity. The normal way to calculate AUM is to sum up an investor's bank deposits, mutual funds, and cash. AUM is one of the measures used to calculate whether or not a fund is a safe and reliable investment, since the shares of a fund that has high AUM will be less likely to swing in price. AUM is mostly the same in the context of VCs, as it is described in the investor dataset from Pitchbook as “Standing for Assets Under Management, AUM represents the amount of capital managed by an investor.” (Pitchbook, 2023; Assets Under Management (AUM): Definition, Calculation, and Example, 2022)

Dry Powder is a term used to describe assets and marketable securities that are highly liquid and cash-like. It also frequently refers to cash held in reserve to pay future obligations. (Dry Powder: Definition, What It Means in Trading, and Types, 2020).

Braun and Stoff (2016) Published an article in the Journal of Private Equity in which they examine whether private equity has become less expensive over time. Costs are calculated by examining the return spread, which is the difference between gross and net returns. They discover that the cost of private equity has risen as a result of the large amount of unused assets in the form of dry powder. Braun and Stoff attribute this to the influx of capital into the private equity market and the market's current state, which they describe as "a victim of its own success." Furthermore, they state that limited partners (LPs) should be aware of the risk of overfunding because the funded amount does not always correspond to the expected return. The authors argue that dry powder is an important component of private equity and should be considered when making investment decisions. By recognizing the impact of dry powder on costs, private equity firms can better navigate market cycles and adjust their investment strategy accordingly. A more anti-cyclical investment strategy entails making investments during downturns or

when market conditions are less favorable, taking advantage of lower asset valuations and potentially generating higher long-term returns.

3. Data

3.1 Sample Selection

The data part of our thesis provides a walkthrough of how we gathered our data and created our dataset. It explains the different parts and how we combined them. The data was gathered in multiple segments, since we needed a lot of different information. To conduct our study, we needed to look at investors and when/where they were born and where they spent their adolescent years. We then needed to connect that to natural disasters to check if they had any traumatic early life experiences. After that we needed to merge it with the information we had about their investments and risk-taking. The main aspects of our data collection are the "*Investor data*", "*VC early life data*", "*Risk*", "*Natural Disasters*" and "*population and income*".

3.2 Investor Data

The Pitchbook database was the primary source of venture capitalist information for our research. This database provides real-time information on private and public companies, startup trends, venture capitalists and private equity investors, as well as specifics about the deals each investor has made. Within the Pitchbook database, we were able to access a comprehensive list of approximately 1.6 million names, each with varying degrees of information and significance. Our goal was to collect information on the VC investors as well as additional relevant details not included, such as their birthplace and birth year. To achieve this, we pursued a number of methods before concluding that linking the data to investor records was the most effective. This allowed us to obtain information specific to each individual's investor status and acquire the necessary keys to locate each individual's transactions. Subsequently, we utilized a Python package to extract specific information from the biographies of individuals and other available columns. This procedure allowed us to define VCs in accordance with our

research objectives. Despite the fact that Pitchbook clarified in a meeting that they did not distinguish between VCs and private equity investors, we sought to ensure the accuracy of our data. As a result, the following criteria were established to define venture capitalists: "*Ventures* | *Startup* | *Business Development* | *Investor* | *Financial Backer* | *Angel Investor* | *Entrepreneur*." Additionally, we excluded individuals who did not currently reside in the United States in order to distinguish our core demographic more precisely. Consequently, the next steps involved investigating potential matches between the available data from Pitchbook and provided datasets and leads.

Using SparSQL, we first matched individuals from our data to those extracted from Wikipedia. This amounted to approximately one thousand names with birth year and, in some cases, county and state of birth. Then doing the same for CrunchBase. The only difference was that we had to use regular expressions (RE) in Python to extrapolate their birth year and county from their biography. Following Bernile et al., (2017), the next step was to develop an HTML-scraper that extracted data from HTML-files collected from the "*Marquis Who's Who database.*" Due to poor formatting in the original files, the majority of the data had to be collected manually. In addition, we created multiple DBpedia queries and scrapers. As well as creating both a Google-scraper and a Bing-based knowledge-pad scraper that sifted through lists of people, automatically searched for them, and then gathered the required data.

To align the received data from Harvard Business School (HBS) and Wikidata with the investor data obtained from PitchBook, we employed fuzzy matching techniques in Python. The purpose was to compare the investor data with the datasets from HBS and Wikidata, which contained birthdate and county information for each individual. Our objective was to extract as many relevant matches as possible, but prior to that, we needed to filter out individuals who were not actual VCs. This necessitated verifying the presence of an investor profile in PitchBook for each individual.

The application of fuzzy matching aimed to identify potential matches among investor names, taking into consideration variations in spelling and formatting. Regrettably, despite our efforts, the fuzzy merging process did not yield any meaningful outcomes. Although fuzzy matching can be a valuable technique, in

this particular case, it failed to establish the desired connections between the datasets.

The reason for the limited results might be that venture capitalists are not under any obligation to disclose details regarding their investments and portfolios. Moreover, many venture capitalists are private individuals who may have minimal online presence or intentionally opt not to maintain a public-facing website. Instead, they often rely on their network and established reputation to source investment opportunities, rather than engaging in active self-promotion. Consequently, acquiring comprehensive information about these investors through conventional online search methods can prove to be a challenging task. As a result, despite our extensive efforts in data scraping and collection, we were compelled to resort to manual data gathering methods.

3.3 VC Early Life Data

Despite its simplicity, the procedure was extremely time-consuming. Despite our efforts with the various data sources at our disposal, only 400 names contained the necessary information for our study. Since we knew that they were all VCs in some capacity either through companies they represented or as private investors on their own. We exported a random list of names from the completed Pitchbook VC search. In addition, the list was selected at random to ensure that no potential bias or subjectivity was prevalent. Utilizing the LinkedIn URL provided by Pitchbook, the following steps were taken locating the individual, determining if their social media profiles contained information about their early life, conducting a Google search and a Radaris search to get the relevant information. Radaris is a public record that aggregates data from public records, social media profiles, online directories, and other publicly available information. We also assumed that they attended high school in the same county in which they grew up. Consequently, high school records were one of the only means we had to determine where they were from. In addition, if there was any doubt as to whether we had the correct person or information, we discarded the name to ensure data quality and integrity.

We collected 1200 names manually, resulting in a total of 1600 VCs who spent their adolescent years in the United States. However, after combining it with the other datasets and removing individuals who lacked the necessary information, we were left with 1002 distinct VCs.

3.4 Risk Data

The risk measurements were obtained from Pitchbook's extensive Investor- and Deal-related databases. Since we had their unique primary and foreign keys, we could access all of their Pitchbook information. This allowed us to link them with use of Python, through their respective companies or as investors, to all their completed and participated-in transactions and deals. This generated 1.6 million rows of various deals to which our investors were attached, which were distributed to our 1002 investors. Although, given the varying data quality here as well, the main dataset of people ended with 894 VC investors.

3.5 Natural Disasters

Regarding our natural disaster dataset, we followed the approach outlined by Bernile et al. (2017). The dataset is divided into two parts: the first spans from 1900 to 1960, and the second spans from 1960 to 2010.

For the first part of the dataset, we largely relied on the same types of disasters as Bernile et al. (2017) did. Including earthquakes, volcanic eruptions, tsunamis, hurricanes, tornadoes, severe storms, floods, landslides, fires, cold waves, heat waves, and blizzards. We constructed this dataset using a similar methodology to theirs. However, due to the unavailability of certain databases they had access to, we followed their alternative approach of utilizing Wikipedia articles, old news articles, and official lists of natural disasters. Initially, we identified articles on all documented natural disasters in the United States during the specified time period. Subsequently, we categorized the disasters by type and decade (e.g., "*earthquakes in the 1910s*"). Then, using the specific names of each natural disaster (e.g., "*Great Lakes Storm of 1913*" or "*1936 Tupelo-Gainesville tornado outbreak*"), we extracted information on the affected counties, states, and fatalities for each event. Given the extensive timeframe, we were unable to gather information on injuries

or financial damages. Figure 1 illustrates an example of a natural disaster in our dataset.

1	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Hays	Texas
2	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Bexar	Texas
18	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Houston	Georgia
1	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Twiggs	Georgia
1	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Twiggs	Georgia
7	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Clay	Alabama
2	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Choctaw	Alabama
0	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Jefferson	Alabama
2	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Meigs	Tennessee
2	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	McMinn	Tennessee
12	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Sedgwick	Kansas
1	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Lincoln	Kansas
1	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Elk	Kansas
1	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Wilson	Kansas
1	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Greenwood	Kansas
1	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Woodson	Kansas
8	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Harvey	Kansas
3	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Marion	Kansas
14	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Greene	Illinois
14	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Macoupin	Illinois
14	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Montgomery	Illinois
14	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Christian	Illinois
15	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Shelby	Illinois
15	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Coles	Illinois
15	1953	April–May 1953 tornado outbreak sequence	Tornado outbreak sequence	Will	Illinois

Figure 1: Example of a natural disaster

For natural disasters occurring after 1960, we incorporated the "United States Spatial Hazard Events and Losses Database (SHELDUS™)." This county-level database encompasses information on injuries, fatalities, property damage, crop damage, and the occurrence dates of natural disasters from 1960 to December 2020. In this aspect, our study diverges from the work conducted by Bernile et al. (2017).

Although our investor sample has a similar mean age of 58 compared to their study's mean age of 57 for CEOs, their study focused on the years 1992 to 2012, whereas our study examines mostly active VCs obtained from Pitchbook in January 2023. Consequently, the mean birth year of our VC sample is 1965, with the youngest VC born in 2002. This distinction holds significant importance for our study, as we have only 195 individuals born before 1955. Since we are investigating the formative years of individuals between the ages of 5 and 15, we primarily utilized the SHELDUS dataset, which provides more robust and detailed information compared to the dataset we constructed ourselves. The data from 1900 to 1960 had less reliable information available and did not include data on injuries and property damage. This is because it is more difficult to obtain quality information about disasters that long ago. Moreover, a lot of the disasters that were reported on, were reported on given the high number of fatalities that they experienced. That meant that less destructive natural disasters might have been underreported.

Although the SHELDUS dataset provided us with high quality data, The data still had to undergo preprocessing, which involves harmonizing column names and data types to facilitate later merging. Additionally, a function was created to convert numeric dates to datetime objects in order to understand when the disaster occurred.

3.6 State and FIPS Data

In the US there are multiple places with the same name, for example there are 31 counties named “Washington” and 5 called “Dallas”. Moreover, in total there are 3195 unique counties across all states and US territories. To make sure that the right state and county was attributed to the right person we used general FIPS codes based on state-level. This means that each state gives a county a combination of three numbers unique to that state plus the states unique number as well. For example, the state code in “Alabama” starts with 01, therefore Washington county in Alabama is *01129*. While Washington county in Florida is *12133*.

Although we had attributed FIPS codes to each county-state, we still had to attribute the FIPS-code to the natural disasters and the investor data. This was done by creating a unique key for each state-county combination. For example, “*Appling-Georgia*” and giving all datasets FIPS codes that we used for all necessary merging.

3.7 Population and Income

For our data on personal income, we used a public dataset from The Bureau of Economic Analysis, that included state level average income from 1929 until 2022. All incomes were inflation adjusted to 2023 values using the US inflation calculator (*Historical Inflation Rates: 1914-2023*, 2008).

The population data was collected from Van Leuven (2020) who used data from the United States Census Bureau. The data was split by county and year from 1900 until 2020, however it only included data for each decade. Since we had no real way of gathering the data for each year and county, we decided to use mean

multiple imputations to calculate the missing years with plausible values based on the information we had available. For our model we first used a standard mean multiple imputation model for the middle year (1905 and so on) and then did the same for 1903 with the use of 1900 and 1905 and so on. This gave us plausible population figures that would work for the purposes in our analysis.

3.8 Strengths and Limitations of the Data Sample

Throughout our research, we engaged in a comprehensive data collection process that included the collection and integration of extensive data from multiple sources. This aided in the creation of a large dataset that enabled us to measure the desired variables. Nonetheless, because of the variety of sources and methodologies used in data collection, it is critical to recognize the dataset's strengths and limitations.

To begin, it is important to recognize the constraints we faced in terms of time and resources during the data collection phase. Given that a significant portion of the data had to be collected manually, we were forced to limit our data collection efforts somewhat within the available time frame.

Furthermore, it is prudent to address the potential bias and subjectivity that can arise when manually gathering data. Recognizing this potential issue, we took steps to mitigate it. The list of investors used in our study was drawn at random from a pool of approximately 60,000 names. This process was repeated several times, with names being excluded only if they were born outside the United States or if there was no publicly available information about them. Furthermore, as described in section *3.2 VC Early Life Data*, we cross-referenced the information on venture capitalists with public records to ensure the accuracy of their location and birth year. While it could be argued that our dataset is biased because we primarily used LinkedIn profiles, it is important to note that most VCs in general already have well-developed profiles on this platform given the value they themselves receive from the networking on the platform. Hence, minimizing any potential bias.

We aimed to maximize the validity and reliability of our findings by acknowledging these limitations and taking the necessary precautions, thereby ensuring the integrity of our research outcomes.

In terms of generalizability, it is worth noting that, despite focusing on a specific group, our dataset has the potential for broader applicability. The inclusion of natural disasters as a variable introduces a random element, whereas birthplace is not unique to our study group. As a result, the methodology used in our study could be replicated in larger-scale studies. Furthermore, our study's extensive time frame enhances its generalizability to some extent.

However, it is important to note that the risk-taking metrics used in our study are highly specific to the world of private equity and venture capitalists. This aspect may pose difficulties when attempting to generalize the findings beyond this specific domain.

We ensure transparency regarding the potential transferability of our findings by acknowledging the nuances and limitations associated with them. While some components of our research could be reproduced on a broader scale, the existence of risk-taking measures that are specific to the industry requires careful consideration when extending the conclusions to other fields.

4. Methodology

4.1 Risk Variables

Capturing a VC investor's willingness to partake in risk is a critical part of the entrepreneurial landscape. VCs investments also have a high associated risk to begin with so to capture their individual willingness for risk in investments is difficult. We therefore rely on previous research to accomplish the goal of creating measurable variables that encapsulates their Risk. As stated in chapter 2.4 Risk, the main inspiration for the risk measures comes from the paper "*Does religiosity influence venture capital investment decisions?"* by Chircop et al. (2020).

4.1.1 Syndication

As previously stated, syndication is the act of investing in a venture alongside one or more investors. Syndication is a big part in the venture capitalist space and has value for other aspects than risk mitigation. Hence, as much as 63.6% of all VC investments were done with some form of syndication Brander et al. (2002). This measure was created by extracting the total number of investors included in each deal for each of the people in our dataset. That meant that there were in total 1.6 million deals that were split on the VCs. Each deal might also have multiple rounds and might therefore also show up multiple times in the dataset, however the numbers of investors might differ for each round. Therefore, to measure each VCs syndication rate, the number of investors for each deal were divided by the unique investor ID and Person ID. This was done to make sure that no unique deal was counted twice while still counting each round of each deal. This was also done in order to generalize each VC as much as possible, since the number of deals would differ from person to person. After this was done the sum of investors were divided by the total number of deals that they had. This created a mean number of total investors for each VC, ranging from 1, all the way up to 36 mean investors for each deal.

In the article by Brander et al. (2002) they treat syndication as a dummy, that is; if there were more than one investor present, they would have it equal to 1. However, when they were checking for robustness, they changed it to a continuous variable. Since we are aggregating the deals to create a mean of the total, it would not be representable if we made it as a dummy, since almost all the investors have been a part of a syndicated deal at some point. Therefore, the syndication measure is kept as "*the mean total investor for each person by number of deals*".

4.1.2 Staging

Staging is proven to be an important tool for the investor to ensure efficiency in the startup and to mitigate risk by preventing losses. Staging is the art of investing into a project throughout multiple rounds of financing. The entrepreneur most often receives their influx of cash when they have reached a milestone or goal that they alongside with their investor agreed upon. The exact methods each VC uses

to conduct their staging is often considered private and the details are often sparse. However, following Tian (2011), who used round-by-round investments gathered by VC investors and entrepreneurs to measure the extent of each VCs staging, we did the same. Pitchbook had data for each deal specifying which round of investment it was. Additionally, since each investor had a unique combination of their person IDs combined with their deal IDs, we converted all rows that contained values of the specific deal-round to 1, and then took the sum of rounds per deal. This created a variable with multiple deals per person that all had unique numbers. When completed, we aggregated the new variable by taking the mean number of rounds per person called "Avg_VCRound". This new variable tells how many rounds each VC normally partakes in for each deal they have. The variable ranges from 1 all the way up to 5.33, which means that some investors stay through the process for above 5 rounds of payouts per investment.

4.1.3 Late-stage

To calculate the "*Late-stage*" measure, it first needed to be defined. Therefore, we opted to use the same type of groupings as Kaplan and Schoar (2005) did when they did their robustness checks. The only difference is that our focus is on VCs and not private equity as a hole. Resulting in "*Seed_Round*, *Early_Stage_VC* and *Late_stage_VC*". These three categories were created by extracting the type of deal the VC in question invested in. Where *seed stage* is investments made in the seed and Angel round stages of investing, Early stage is made in the series A, B and C stages and Late-stage is the series D and E. After this each value was transformed to 1 and summed up for each investor. One investor with multiple deals could therefore have scores in all three categories, E.g.,

Early_Stage_VC	**Late_Stage_VC**	**Seed_Round**
89	254	8

This information was then changed to a numerical where Seed would equal 3, Early stage 2 and Late-stage equal to 1. The next step was then to sum all values and create a mean total score for each VC. With the example above, that VC

would get a score of 1.29914. The reasoning behind this approach, instead of keeping the one with the highest score, is that it would not be completely representative. Especially since our dataset had a differing number of rows for each VC. Moreover, it would create an unfair picture, since the investor in the example above would have a score of 1 instead of the 1.299 that they ended up with.

4.1.4 AUM and Dry Powder

Both Assets under Management (AUM) and Dry Powder are gathered directly from Pitchbook and are investor-specific information. This meant that every investor had that information available.
Dry Powder is defined as “Amount of cash reserves or liquid assets available to deploy by an investor». While AUM represents “the amount of capital managed by an investor” (Pitchbook, 2023).

4.2 Robustness: Selection of Variables

In this research, the control variables were carefully selected to isolate the effects of natural disasters during a venture capitalist's formative years on their risk-taking behavior. The control variables incorporated in the analysis are Age, Age Squared, VC Is Female, and Income.

Age and Age Squared: Age is a critical factor, as it not only reflects the life stage of the venture capitalist but also serves as a proxy for experience. It is reasonable to assume that as a venture capitalist ages, their investment patterns and risk-taking behaviors may change. Additionally, to capture the potential non-linear relationship between age and risk-taking behavior, the square of age (Age Squared) is included. This allows for the modeling of a curvilinear effect, where the influence of age may change as venture capitalists move through different stages of their career.

VC Is Female: Including gender as a control variable is essential to account for any systematic differences in risk-taking behavior between male and female venture capitalists. Gender can potentially influence investment decisions and risk

preferences, and controlling for this ensures that the effects attributed to formative experiences are not confounded by gender differences.

Income: Income here refers to the income level during the venture capitalist's formative years. This control variable is crucial for accounting for the socio-economic background in which the venture capitalist was raised. It is plausible that individuals who grew up in higher-income households might have different risk tolerances and investment behaviors than those from lower-income backgrounds. By controlling for the income during the formative years, the analysis isolates the impact of formative experiences with natural disasters from the potential influence of socio-economic background on risk-taking behavior.

After considering these control variables, special attention was given to the decision of whether or not to include investment controls in the models. Investment controls, such as the number of investments and the natural logarithm of investments, were initially considered.

However, a high correlation is likely between a venture capitalist's age and their investment experience, as the latter generally accumulates over time. Including the number of investments and its natural logarithm could mechanically link and correlate with the risk-taking proxies, potentially masking the independent effects of formative experiences with natural disasters on risk-taking behavior.

This was corroborated by examining regression models with and without these investment controls for both Staging and Syndication. For Staging, the coefficient of Medium.Fatality.Experience became less negative with the introduction of the investment controls, indicating that investment experience might be absorbing some effects that should be attributed to formative experiences with natural disasters.

For Syndication, a similar pattern was observed. The inclusion of investment controls affected the coefficient of Medium.Fatality.Experience. In particular, in one model, it switched signs to become positive. Moreover, the natural logarithm of investments captured a substantial proportion of the variation in Syndication, as

indicated by sizable coefficients and significance levels. This again raised concerns that the primary relationship of interest could be obscured.

Another observation was that the coefficient for Age was negative and significant across all models for Syndication, suggesting that as venture capitalists age, they may be less likely to engage in Syndication, possibly due to a reduced appetite for risk-taking. This underlined the relevance of age as a control variable.

In light of these observations and to maintain consistency across both Staging and Syndication analyses, we opted for a more parsimonious model that excludes investment controls. This approach allows for a focused examination of the relationship between formative experiences with natural disasters and risk-taking behavior, without the confounding influence of investment experience. Age, included as a control variable, serves as a reasonable proxy for investment and entrepreneurial experience. This choice ensures that the effects attributed to formative natural disaster experiences are not artificially diluted or overshadowed by the inclusion of investment controls, leading to more robust and interpretable results.

In our endeavor to thoroughly understand the impact of early-life exposure to natural disasters on venture capitalists' investment choices, we realized the necessity to broaden our analytical lens. While our initial metrics provided valuable insights, we felt that an extended analysis with alternative measures could reveal more nuanced trends and add depth to our understanding. To ensure the rigor and comprehensiveness of our study, it is imperative to explore the data through various angles, which brought us to incorporate continuous measures into our analysis.

The initial decision to use fatality rate as a categorical measure for the intensity of natural disasters was an informed choice, inspired by the work of Bernile et al. (2017). Though this measure served as a solid foundation, we recognized the importance of diversifying the metrics to capture the different dimensions of early-life experiences.

As an augmentation to our primary analysis, we have integrated continuous variables such as average fatality rate, average injury rate, and average property damage incurred from natural disasters experienced during the venture capitalists' formative years. Employing continuous variables could potentially paint a more granular picture, capturing subtle variations that might not be as pronounced or noticeable when using categorical variables.

This expanded analysis is not meant to replace, but rather to complement our primary study. By incorporating continuous measures, we aim to investigate whether these additional dimensions provide corroborative or contrasting insights, thus contributing to a more comprehensive and robust understanding of the subject matter.

Please refer to section 6.2, "Extended Analysis: Diverse Metrics for Early Life Experience", for a detailed exposition of the results and findings emanating from this extended analysis. This section delves into the insights gleaned from the continuous measures and critically examines their implications in the broader context of venture capitalists' investment behavior in relation to early-life experiences.

4.3 Causality

In our study, we aim to investigate the causal relationship between early-life experiences and VCs risk-taking behavior. Instead of relying solely on simple correlations, we employ a rigorous methodology to establish causal links between these factors. To achieve this, it is essential to identify a suitable instrumental variable that is exogenous and unrelated to other factors influencing risk-taking behavior.

Finding random instrumental variables in natural settings can be challenging. However, we identify natural disasters as a potential instrumental variable for our study. While the occurrence of natural disasters may be influenced by human activities to some extent, individual VCs cannot selectively choose to experience such events for the purpose of affecting their risk-taking behavior. Hence, natural

disasters offer a source of exogenous variation that can plausibly be considered as a random shock to early-life experiences.

To ensure the robustness of our findings, we include fixed effects for VC birth year, income during upbringing, and state of birth in all our empirical models. These fixed effects help to control for the potential confounding effects of cohort characteristics, income disparities, and state-specific factors that could influence risk-taking behavior. By incorporating these fixed effects, we effectively isolate the variation in risk-taking behavior that can be attributed to early-life experiences, enhancing the causal interpretation of our results.

It is worth noting that while our methodology provides a strong basis for establishing causal links, there may still be other unobserved factors that could potentially influence VC risk-taking behavior. Therefore, caution should be exercised in interpreting the causality implied by our findings. Nonetheless, our approach addresses many of the challenges associated with establishing causality in observational studies and contributes to a more nuanced understanding of the relationship between early-life experiences and VC risk-taking behavior.

5. Summary Statistics

Table I - Top 10 VC birth states and Disaster Experience

Table I: Top 10 Vc Birth states and Disaster Experinece

Top 10 Birth States across all VCs	Number of VCs	% No Fatality	% Medium Fatality	% Extreme Fatality
California	174	27.59%	49.43%	22.99%
New York	156	14.10%	75.64%	10.26%
Massachusetts	55	16.36%	81.82%	1.82%
Illinois	45	8.89%	80%	11.11%
New Jersey	41	19.51%	68.29%	12.20%
Pennsylvania	38	23.68%	71.05%	5.26%
Texas	35	11.43%	62.86%	25.71%
Ohio	33	18.18%	81.82%	0%
Michigan	27	18.52%	74.07%	7.41%
Maryland	23	0%	91.30%	8.70%

Table I reports the top 10 birth states across all the VCs and their distribution into the three disaster experience categories. For example, 174 VCs are born in California; 27.59% of the 174 VCs born in California did not experience any fatal disasters during the ages of 5 to 15 and are categorized in the No Fatality group.

Table II - Top VC birth States by Disaster Experience Categories

Table II: Top 10 VC Birth States by Disaster Experience Categories

No Fatality Experience		Medium Fatality Experience		Extreme Fatality Experience	
Top 10 Birth States	Number of VCs	Top 10 Birth States	Number of VCs	Top 10 Birth States	Number of VCs
California	48	New York	118	California	40
New York	22	California	86	New York	16
Massachusets	9	Massachusets	45	Texas	9
Pennsylvania	9	Illinois	36	Illinois	5
New Jersey	8	New Jersey	28	New Jersey	5
Ohio	6	Pennsylvania	28	Maryland	2
Michigan	5	Ohio	27	Michigan	2
Illinois	4	Texas	22	Pennsylvania	2
Texas	4	Maryland	21	Massachusets	1
Maryland	0	Michigan	20	Ohio	0

Table II displays the ten predominant birth states for VCs within the No Fatality, Medium Fatality, and Extreme Fatality groups, along with the number of VCs originating from each state who belong to the respective disaster experience group. New York is the modal birth state for VCs in the Medium Fatality group, while 48 VCs in the No Fatality group hail from California.

Additionally, it is noteworthy that Texas exhibits a unique distribution across the groups. It ranks low in both the No Fatality and Medium Fatality groups but claims the third-highest spot in the Extreme Fatality group. This may be indicative of the varying types and intensities of natural disasters that have occurred in Texas during the formative years of the VCs, positioning it more prominently within the Extreme Fatality category.

6. Results

In this section, we delve into the examination of the relationship between venture capitalists' attitudes towards risk, particularly indicated by their early-life exposure to natural disasters, and various investment decisions and outcomes relating to VC decision-making processes, including staging and syndication with other VCs. Prior research in this field has largely explored cohort effects. For

instance, Malmendier et al. (2011) conducted an insightful study that investigated the cohorts impacted by the Great Depression during their formative years. However, our approach transcends the confines of a specific cohort and casts a wider net in examining early-life experiences. In all our empirical models, we incorporate fixed effects to account for the VC birth year, income growing up, and state of birth fixed effects. By incorporating these four types of fixed effects, we effectively mitigate the potential influence of cohort effects.

To clarify the significance of excluding cohort effects, let us consider two examples. Firstly, at any given point in time, a VC who grew up in Texas may have experienced a major hurricane, while another VC of the same age growing up in California might not have encountered such an event. However, differences in risk aversion and attitudes towards risk might exist between individuals in Texas and California due to cultural factors, potentially resulting in divergent perspectives. Our objective is to prevent these inherent differences from tainting our estimation results.

Similarly, a VC who experienced Hurricane Allen in Texas might not be directly comparable to a VC born in Texas 15 years prior. Within a particular state, population dynamics and economic conditions undergo transformations over time, giving rise to temporal variations in state-level characteristics that can exert an influence on our inferences. By controlling for the aforementioned four types of fixed effects, our analyses exclusively capture heterogeneity within cohorts across different VCs. It is worth noting that our findings remain robust even when one or more of these fixed effects are excluded.

To account for the potential impact of certain counties being more susceptible to disasters, all tests also take into consideration the non-linear relationship between the expected fatality rate from disasters in the VC's birth county between 1955 and 2010. Consequently, a VC's residual experience of disasters over a 10-year period is effectively randomized. In our modeling, we employ a non-linear specification to capture the effects of disaster experiences on VCs.

In a similar vein, alternative specifications augment the baseline models to ensure that our treatment effects do not capture unaccounted-for non-linearities between

the dependent variables and any other control variable. Across all tests, the standard set of control variables includes VC age and age squared, VC real income as well as an indicator for female VCs. By including these control variables, we aim to mitigate the potential influence of these factors on our estimated relationships, thus isolating the specific effects of VC disaster experience on the various dependent variables of interest.

6.1 Main Results - Do Early Life Experiences Affect Investors' Willingness for Risk?

Table III - Main Analysis: Impact of Early-life Disaster Experiences on Staging and Syndication of Investments

	Dependent variable:			
	Staging		Syndication	
	(1)	(2)	(3)	(4)
Medium.Fatality.Experience	-0.081	-0.053	-0.034	-0.028
	(0.069)	(0.067)	(0.292)	(0.292)
Extreme.Fatality.Experience	0.023	0.038	0.167	0.170
	(0.090)	(0.087)	(0.380)	(0.381)
Age	0.002	-0.0005	-0.130*	-0.131*
	(0.017)	(0.017)	(0.072)	(0.072)
Age.Squared	-0.00003	-0.00001	0.001	0.001
	(0.0002)	(0.0002)	(0.001)	(0.001)
VC.Is.Female	0.050	0.055	0.478	0.479
	(0.073)	(0.070)	(0.306)	(0.307)
Income	0.00002**	0.00001*	0.00004*	0.00004
	(0.00001)	(0.00001)	(0.00003)	(0.00003)
Investments		0.001***		0.0001
		(0.0001)		(0.0003)
Constant	1.450**	1.570***	7.920***	7.950***
	(0.568)	(0.551)	(2.400)	(2.400)
Observations	894	894	894	894
R^2	0.032	0.089	0.039	0.039
Adjusted R^2	0.026	0.082	0.033	0.032
Residual Std. Error	0.806 (df = 887)	0.782 (df = 886)	3.400 (df = 887)	3.400 (df = 886)
F Statistic	4.930*** (df = 6; 887)	12.400*** (df = 7; 886)	6.050*** (df = 6; 887)	5.210*** (df = 7; 886)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table III presents OLS regression estimates examining the relationship between VC disaster experience and investment characteristics, namely Staging and Syndication. Control variables such as Age, Age.Squared, VC.Is.Female, and

Income are consistently included in all models. Columns (2) and (4) also include Investments as an additional control variable.

Focusing on Columns (1) and (2) where Staging is the dependent variable, we observe that in Column (1), the coefficient for Medium Fatality Experience is -0.081. This suggests that VCs who experienced medium levels of fatality during their formative years might exhibit an 8.1% decrease in Staging. However, it is critical to note that this relationship is not statistically significant, as indicated by the standard errors. The Extreme Fatality Experience coefficient in the same column is 0.023, hinting at a 2.3% increase in Staging for those VCs who experienced extremely fatal events. Like the Medium Fatality Experience, this relationship is also not statistically significant.

Moving on to Column (2), which incorporates Investments as an additional control, the coefficient for Extreme Fatality Experience inches up to 0.038, while that for Medium Fatality Experience dips to -0.053. Significantly, the coefficient for Investments is 0.001 and is statistically significant at the 1% level. This indicates that the number of investments a VC partakes in has a positive association with Staging.

Shifting our attention to Columns (3) and (4), where Syndication is the dependent variable, in Column (3) the coefficient for Extreme Fatality Experience stands at 0.167. This implies a 16.7% increase in Syndication for VCs who underwent extremely fatal events in their childhood. Medium Fatality Experience, on the other hand, has a coefficient of -0.034, suggesting a 3.4% decrease in Syndication. When Investments is introduced as an additional control in Column (4), the coefficient for Extreme Fatality Experience marginally rises to 0.170, while Medium Fatality Experience sees a slight reduction to -0.028.

Examining the control variables, Age in Column (3) has a coefficient of -0.130 and is significant at the 10% level, suggesting an inverse relationship between age and Syndication. Notably, in Column (1) for Staging, Age only has a trivial positive coefficient of 0.002.

Income is an intriguing control variable. In Column (3), it has a coefficient of 0.00004 and is statistically significant at the 5% level. In Column (1) for Staging, it also has a positive, albeit very small, coefficient of 0.00002, and it is statistically significant at the 5% level.

Despite the insights these coefficients offer, it is crucial to recognize that the R-squared and adjusted R-squared values are relatively low. This indicates that the models account for only a small fraction of the variability in Staging and Syndication, which may suggest the importance of factors not considered in these models.

In conclusion, the analysis provides a multifaceted understanding of how early-life experiences of fatal disasters may influence a VC's investment traits, particularly in Staging and Syndication. While the coefficients hint at potential associations, the lack of robust statistical significance for the disaster experience variables calls for prudence in interpreting these results. Moreover, the inclusion of the Investments variable noticeably impacts the model, especially as the coefficient for Extreme Fatality Experience shows a slight rise when Investments is included. This suggests that the number of investments a VC engages in may moderately accentuate the link between extreme fatality experiences in early life and a predilection for Syndication.

Table IV Relationship Between Early-life Disaster Experiences and Late-Stage Investments

	Dependent variable:	
	`Late-Stage`	
	(1)	(2)
Medium.Fatality.Experience	0.018	0.015
	(0.040)	(0.040)
Extreme.Fatality.Experience	0.001	-0.0003
	(0.052)	(0.052)
Age	-0.025**	-0.024**
	(0.010)	(0.010)
Age.Squared	0.0002*	0.0002*
	(0.0001)	(0.0001)
VC.Is.Female	0.004	0.003
	(0.042)	(0.042)
Income	-0.00000	-0.00000
	(0.00000)	(0.00000)
Investments		-0.00004
		(0.00004)
Constant	2.750***	2.740***
	(0.328)	(0.328)
Observations	836	836
R^2	0.022	0.023
Adjusted R^2	0.015	0.015
Residual Std. Error	0.453 (df = 829)	0.453 (df = 828)
F Statistic	3.130*** (df = 6; 829)	2.830*** (df = 7; 828)
Note:		*p<0.1; **p<0.05; ***p<0.01

Moving on to Table IV, which represents alternative measures of VC risk-taking behavior through examining their investment timing in startups. The rationale behind this measure is that investing at an earlier stage is generally associated with higher risk due to the limited availability of information. As a company matures, more information becomes available, reducing the perceived risk.

However, similar to our previous regressions, these alternative measures of risk-taking do not yield statistically significant results. This suggests that the early-life experiences of VCs, as captured by the proxies used in our analysis, do not have a significant impact on their risk-taking behavior when measured through investment timing.

Our findings, although nuanced, offer intriguing insights. Contrary to our initial expectations, neither Medium.Fatality.Experience nor Extreme.Fatality.Experience exhibit a statistically significant relationship with Late-Stage.

When evaluating the control variables in our model, we observe some significant findings. Specifically, Age displays a negative relation with risk-taking behavior. The coefficient of -0.025 indicates that for each incremental year of the VC's age, there is a corresponding reduction in risk-taking behavior of 0.025 units, which is statistically significant at the 0.05 level.

However, the relationship between age and risk-taking is not linear, as shown by the Age.Squared variable. With a coefficient of 0.0002, it indicates a nonlinear relationship with risk-taking behavior, suggesting that while risk-taking decreases with age, the rate of decrease slows as VCs grow older. The marginal significance of this variable (p=0.1) confirms this nuanced relationship.

Examining the role of gender through the VC.Is.Female variable, we find no significant evidence that gender affects VC risk-taking behavior, with a coefficient of 0.003. This finding aligns with the gender-neutral approach to risk in the venture capital sector.

Interestingly, the number of investments undertaken by VCs has a dual, albeit contrasting, effect on risk-taking behavior. On one hand, as the number of investments increases, so does VC risk-taking behavior. However, the effect on VC risk-taking behavior diminishes as the number of investments further increases. This suggests a decreasing return to scale in risk-taking with an increasing number of investments.

Overall, this model, although explaining a relatively small portion of the variation in VC risk-taking behavior, provides valuable insights into the determinants of risk-taking in VCs. Further research could explore additional factors or delve deeper into the identified determinants to gain a more comprehensive understanding of VC risk-taking behavior.

Table V - Relationship Between Early-life Disaster Experiences and AUM to Dry Powder Ratio

	Dependent variable:
	`AUM to Dry Powder Ratio`
Medium.Fatality.Experience	206.419
	(412.054)
Extreme.Fatality.Experience	248.075
	(530.554)
Age	-122.547
	(102.452)
Age.Squared	1.981*
	(1.050)
VC.Is.Female	525.295
	(454.155)
Income	0.060
	(0.038)
Constant	-787.088
	(3,301.841)
Observations	416
R^2	0.025
Adjusted R^2	0.010
Residual Std. Error	3,286.531 (df = 409)
F Statistic	1.730 (df = 6; 409)
Note:	*p<0.1; **p<0.05; ***p<0.01

In the regression analysis focusing on the AUM to Dry Powder Ratio as a proxy for risk-taking, a higher ratio implies that the VC firm holds more assets under management compared to its dry powder, suggesting a lower risk appetite or a more conservative investment strategy. Conversely, a lower ratio indicates that the VC firm holds fewer assets in comparison to its available dry powder, indicative of a higher risk appetite or a more aggressive investment stance.

In this model, neither of the early life experience variables, Medium.Fatality.Experience and Extreme.Fatality.Experience, were statistically significant in relation to the AUM to Dry Powder Ratio. This suggests that, within the scope of this data, there is no strong evidence linking these variables to the risk profile as measured by the AUM to Dry Powder Ratio.

Interestingly, Age.Squared has a positive coefficient of 1.981 and is statistically significant at the 10% level. This implies a U-shaped relationship between Age and the AUM to Dry Powder Ratio. As the age of the VC increases, the AUM to Dry Powder Ratio initially declines and subsequently rises. This pattern suggests that VC firms might initially take on higher risks, become more conservative in the mid-stage, and then revert to a higher risk profile as they mature.

The Income variable displayed a positive coefficient of 0.060 but was not statistically significant. The positive direction implies a potential association between income levels and the AUM to Dry Powder Ratio, although not firmly established in this model.

6.2 Extended Analysis: Diverse Metrics for Early Life Experience

In this extended analysis, which emerges as a consequence of our robustness tests focusing on continuous measures, we take a more granular approach to assess the impact of venture capitalists' early-life exposure to natural disasters on their investment decisions. This analysis uniquely integrates continuous variables - specifically, average fatalities, injuries, and property damages - as we strive to unravel the subtle variations that might not be captured by categorical variables. A compelling aspect of this extended analysis is the focus on 'Late-Stage' as the dependent variable, which draws attention to an intriguing dimension of how early-life disasters might be linked to venture capitalists' risk-taking on how early they invest in companies. Our aim is to furnish a more intricate and comprehensive understanding of the relationships at play.

Table VI - Staging with continuous measure of early life experience

	Dependent variable:				
	Staging				
	(1)	(2)	(3)	(4)	(5)
C_Mean_Fatalities	-4,234.000			-6,597.000	
	(15,075.000)			(15,237.000)	
C_Mean_Injury		2,174.000		1,731.000	
		(2,391.000)		(2,615.000)	
C_Mean_Property			0.027	0.019	
			(0.032)	(0.035)	
Medium.Fatality.Experience					-0.053
					(0.067)
Extreme.Fatality.Experience					0.038
					(0.087)
Age	-0.003	-0.003	-0.003	-0.003	-0.0005
	(0.017)	(0.016)	(0.016)	(0.017)	(0.017)
Age.Squared	0.00000	0.00001	0.00001	0.00001	-0.00001
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
VC.Is.Female	0.058	0.057	0.056	0.057	0.055
	(0.071)	(0.070)	(0.070)	(0.071)	(0.070)
Income	0.00001*	0.00001*	0.00001*	0.00001*	0.00001*
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Investments	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Constant	1.640***	1.600***	1.610***	1.600***	1.570***
	(0.547)	(0.548)	(0.547)	(0.549)	(0.551)
Observations	894	894	894	894	894
R^2	0.087	0.088	0.088	0.088	0.089
Adjusted R^2	0.081	0.082	0.082	0.080	0.082
Residual Std. Error	0.783 (df = 887)	0.782 (df = 887)	0.782 (df = 887)	0.783 (df = 885)	0.782 (df = 886)
F Statistic	14.100*** (df = 6; 887)	14.200*** (df = 6; 887)	14.200*** (df = 6; 887)	10.700*** (df = 8; 885)	12.400*** (df = 7; 886)
Note:					*p<0.1; **p<0.05; ***p<0.01

Table VII - Syndication with continuous measure of early life experience

	Dependent variable:				
	Syndication				
	(1)	(2)	(3)	(4)	(5)
C_Mean_Fatalities	-28,983.000			-36,821.000	
	(65,508.000)			(66,221.000)	
C_Mean_Injury		9,599.000		10,058.000	
		(10,392.000)		(11,365.000)	
C_Mean_Property			0.052	0.008	
			(0.141)	(0.154)	
Medium.Fatality.Experience					-0.028
					(0.292)
Extreme.Fatality.Experience					0.170
					(0.381)
Age	-0.134*	-0.134*	-0.134*	-0.134*	-0.131*
	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)
Age.Squared	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
VC.Is.Female	0.485	0.483	0.481	0.487	0.479
	(0.306)	(0.306)	(0.306)	(0.307)	(0.307)
Income	0.00004	0.00004*	0.00004	0.00004	0.00004
	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00003)
Investments	0.0001	0.0001	0.0001	0.0001	0.0001
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Constant	8.180***	7.970***	8.090***	8.020***	7.950***
	(2.380)	(2.380)	(2.380)	(2.380)	(2.400)
Observations	894	894	894	894	894
R^2	0.039	0.040	0.039	0.040	0.039
Adjusted R^2	0.033	0.034	0.033	0.032	0.032
Residual Std. Error	3.400 (df = 887)	3.400 (df = 887)	3.400 (df = 887)	3.400 (df = 885)	3.400 (df = 886)
F Statistic	6.040*** (df = 6; 887)	6.160*** (df = 6; 887)	6.040*** (df = 6; 887)	4.650*** (df = 8; 885)	5.210*** (df = 7; 886)
Note:					*p<0.1; **p<0.05; ***p<0.01

Upon scrutinizing Tables VII and XIII, which evaluate the 'Staging' and 'Syndication' variables respectively, several key observations emerge concerning the continuous measurements of early-life experiences. Initially, considering the continuous measurement of fatalities as opposed to the categorical approach previously employed, it is evident that there is no significant relationship between fatalities due to natural disasters and either the 'Staging' or 'Syndication' variables. The coefficient estimates for fatalities are statistically insignificant.

Furthermore, when examining injuries as an element of early-life disaster experiences, the analysis reveals that, analogous to fatalities, there is no significant causal link between injuries from natural disasters and either 'Staging' or 'Syndication'. The estimates for the continuous measurements of injuries are not statistically significant.

In the same vein, analyzing property damage caused by natural disasters, the results consistently indicate that none of the continuous measurements of property damage exhibit any significant relationship with 'Staging' or 'Syndication'.

In summation, these observations collectively signal that irrespective of the nature of early life experiences, whether they be fatalities, injuries, or property damages, none of these variables exert a significant impact on the 'Staging' or 'Syndication' variables when measured continuously. This aligns with and reinforces the conclusions drawn in Section 6.1, attesting to the robustness and consistency of those findings across different measures.

It is also pertinent to bear in mind that the absence of statistical significance does not necessarily imply the absence of an actual effect; it may simply indicate that the data available is not sufficient to conclusively establish a relationship.

Table VIII - Late-stage with continuous measure of early life experience

	Dependent variable:				
	`Late-Stage`				
	(1)	(2)	(3)	(4)	(5)
C_Mean_Fatalities	-7,604.000			-10,113.000	
	(8,732.000)			(8,808.000)	
C_Mean_Injury		2,834.000**		2,770.000*	
		(1,387.000)		(1,516.000)	
C_Mean_Property			0.021	0.009	
			(0.019)	(0.021)	
Medium.Fatality.Experience					0.015
					(0.040)
Extreme.Fatality.Experience					-0.0003
					(0.052)
Age	-0.024**	-0.024**	-0.024**	-0.024**	-0.024**
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Age.Squared	0.0002*	0.0002*	0.0002*	0.0002*	0.0002*
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
VC.Is.Female	0.004	0.003	0.002	0.004	0.003
	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)
Income	-0.00000	-0.00000	-0.00000	-0.00000	-0.00000
	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)
Investments	-0.00004	-0.00004	-0.00004	-0.00004	-0.00004
	(0.00004)	(0.00004)	(0.00004)	(0.00004)	(0.00004)
Constant	2.750***	2.680***	2.710***	2.690***	2.740***
	(0.325)	(0.325)	(0.325)	(0.326)	(0.328)
Observations	836	836	836	836	836
R^2	0.024	0.028	0.025	0.030	0.023
Adjusted R^2	0.017	0.021	0.017	0.020	0.015
Residual Std. Error	0.452 (df = 829)	0.452 (df = 829)	0.452 (df = 829)	0.452 (df = 827)	0.453 (df = 828)
F Statistic	3.400*** (df = 6; 829)	3.980*** (df = 6; 829)	3.480*** (df = 6; 829)	3.160*** (df = 8; 827)	2.830*** (df = 7; 828)
Note:					*p<0.1; **p<0.05; ***p<0.01

In Table VIII, which presents the results with 'Late-Stage' as the dependent variable, we see an interesting departure from the patterns observed in the analyses for 'Staging' and 'Syndication'. 'Late-Stage' represents the venture capitalist's propensity to invest earlier in a startup’s lifecycle.

Focusing on the continuous measurement of fatalities, the coefficient estimates in columns (1) and (4) are not statistically significant. This indicates that the average number of fatalities experienced during natural disasters in early life does not have a discernible effect on venture capitalists' tendencies to make late-stage investments.

However, a different trend is evident when considering injuries as an element of early-life disaster experiences. The coefficient estimates for the continuous measurement of injuries in columns (2) and (3) are statistically significant at the

5% level and 10% level, respectively. This suggests a meaningful relationship between the average number of injuries experienced during natural disasters in early life and the inclination of venture capitalists to invest during the later stages of a startup's lifecycle.

Regarding the continuous measurement of property damage caused by natural disasters, the estimates presented in columns (3) and (4) are not significant, mirroring the pattern observed for fatalities.

6.3 Findings from the Extended Analysis

During our robustness tests with different measures for early life disaster exposure, we discovered something intriguing. We focused on the "Late-Stage" as the dependent variable to measure risk-taking. Interestingly, we found that the number of injuries from natural disasters experienced in a VC's childhood was significantly related to the Late-Stage variable, with a p-value of less than 0.05. However, it is crucial to highlight that this is a continuous measure, making it challenging to compare directly with our other results that mainly show linear relationships.

To further investigate this relationship, we employed the same methodology as when we created categorical variables for fatalities. This adaptation allowed us to examine how the intensity of the injury measure impacts risk-taking. Nevertheless, upon inspection, none of the categorical variables for injuries were significant.

Despite the non-significance of the categorical injury measures, it is vital to consider the implications of the continuous injury measure. It can be interpreted that injuries could often be regarded as a more moderate consequence compared to fatalities resulting from disasters. Since the continuous injury measure exhibits significance with a positive coefficient for the Late-Stage variable, this suggests that moderate levels of disaster experience in early life, as measured by injuries, affect the stage at which VCs invest in startups. As elaborated in the literature review, the earlier a VC invests in a startup, the higher the risk they take on.

Consequently, if moderate levels of early life disaster, as represented by injuries, correlate with VCs investing later, it implies that they may be more risk-averse.

This finding is particularly groundbreaking concerning the effects of early life experiences. Up until now, both our results and supporting literature have consistently indicated that moderate levels of disaster experience during formative years should increase the willingness to undertake risks (Malmendier et al. 2011; Bernile et al. 2017).

This unexpected trend calls for cautious interpretation and further exploration. There could be underlying factors or mechanisms not captured in the current models. Additionally, the dichotomy between the effects of moderate disasters as represented by injuries and more severe disasters as reflected in fatalities necessitates a more nuanced understanding. This topic is fertile ground for future research and would make for an excellent focus for a subsequent master's thesis or academic investigation. Understanding the impact of early life experiences, particularly those characterized by different levels of severity, on risk-taking behaviors is not only academically rewarding but also carries implications for the decision-making processes in venture capital investments.

7. Discussion

In comparing our findings to the results obtained in the study *"What Doesn't Kill You Will Only Make You More Risk-Loving*" by Bernile et al. (2017), several notable differences emerge. Both studies explore the relationship between individuals' early-life experiences with fatal disasters and their subsequent risk-taking behavior. However, the focus and methodology of the two studies differ, which may account for the variations in the significance of the results.

Bernile, Bhagwat, and Rau examine this relationship in the context of CEOs and their corporate policies and decisions. They find a consistent nonmonotonic relationship between CEO experiences with fatal disasters during childhood and corporate risk-taking. Specifically, CEOs with moderate disaster fatality experiences tend to adopt riskier corporate policies compared to those with no

disaster experiences, while CEOs with extreme disaster fatality experiences exhibit less risky policies.

In contrast, our study focuses on individual venture capitalists and their risk-taking behavior in the context of deal-making. While we assess the same measures for early-life experiences, namely the level of fatal disasters, our dependent variables differ. We measure risk-taking through variables related to syndication, staging, and late-stage decisions. Despite employing similar methods to capture early-life experiences, our results do not yield statistically significant relationships between VC early-life experiences and risk-taking behavior.

One possible explanation for the lack of significance in our results compared to the estimates of Bernile, Bhagwat, and Rau is the presence of unobserved variables that may influence risk-taking behavior in the VC industry. It is plausible that factors not captured in our analysis, such as personal characteristics, industry dynamics, or other unmeasured contextual factors, could be driving risk-taking decisions among VCs. These unobserved variables might confound the relationship between early-life experiences and risk-taking behavior, leading to non-significant findings.

However, it is worth noting that our study carefully considered and addressed potential confounding factors by incorporating firm fixed effects and controls for non-disaster-related factors at the county or state of birth level. Furthermore, we employed various measures of risk-taking behavior and conducted robustness checks, which enhance the reliability of our findings. Despite these precautions, our results did not yield statistically significant relationships between early-life experiences and risk-taking behavior in the VC industry.

An intriguing aspect to consider is the nature of the venture capital market itself, which inherently involves higher levels of risk compared to traditional business environments. One might expect that the heightened risk exposure within the VC industry would amplify the influence of early-life experiences on risk-taking behavior. However, our findings do not support this hypothesis, suggesting that other factors beyond early-life experiences may play a more prominent role in shaping risk-taking decisions among VCs.

Moreover, the non-significant results across our three different measures of risk-taking behavior further emphasize the complexities of understanding the relationship between early-life experiences and risk preferences in the VC context. Despite exploring multiple dimensions of risk-taking, including syndication, staging, and late-stage decisions, none of these variables exhibited a significant effect associated with early-life experiences.

Our findings from Table III are consistent with prior research, including the work of Ferrary (2010). We observe that age shows a statistically significant negative relationship with syndication, aligning with Ferrary's findings. According to Ferrary, younger VCs with less experience and knowledge are more likely to engage in syndication as they seek to leverage the expertise of other investors and reduce risk. In contrast, our results suggest that more experienced and knowledgeable VCs are less dependent on syndication, as they possess the necessary skills to make independent investment decisions. This finding supports the notion that syndication serves as a mechanism for mitigating information asymmetry and learning among less experienced VCs. Additionally, our results highlight the importance of investments as a predictor of syndication behavior. Both measures of investments show statistically significant relationships, reinforcing the role of experience and expertise in VC decision-making. These findings contribute to the existing body of knowledge on syndication behavior and further validate the insights provided by (Ferrary, 2010).

In light of these contrasting results, it is essential to acknowledge the limitations of our study and the potential for future research to delve deeper into the multifaceted nature of risk-taking behavior among VCs. While our study contributes to the understanding of risk-taking behavior in the VC industry, the lack of significant findings calls for continued exploration and refinement of the underlying factors influencing risk preferences in this context.

It is worth noting that the issue of overly significant p-values in scientific papers is a well-known concern. While our study may not have produced statistically significant results, it is crucial to consider the context and complexity of the phenomenon being studied. The significance of a finding should not solely

determine interpretation or the value of the research itself. Instead, the scientific community should encourage a more nuanced and comprehensive approach to analyzing and interpreting results.

Indeed, the issue of overly significant p-values in scientific papers is a topic of concern within the research community. Many studies, particularly those seeking publication in prestigious journals, place a strong emphasis on achieving statistically significant results. This emphasis often stems from the desire to validate hypotheses and support claims with robust evidence.

The absence of significant findings in our study does not imply that our research is less valuable or less objective. On the contrary, the absence of significant results can provide valuable insights into the complexities and nuances of the phenomenon under investigation. It allows us to question assumptions, explore alternative explanations, and acknowledge the limitations of our study.

By approaching our research with a focus on understanding the underlying mechanisms and contributing to the academic discourse, we strive to provide a comprehensive analysis of the topic at hand. Our objective is to foster a deeper understanding of risk-taking behavior among venture capitalists, even if our findings do not align with the expectations of statistical significance.

In conclusion, our master's thesis serves as a platform for thoughtful reflection on the relationship between early-life experiences and risk-taking behavior among venture capitalists. While our study did not yield statistically significant results, it offers valuable insights and opens avenues for further research and discussion in this field. We humbly acknowledge the limitations of our study and encourage future researchers to explore this topic from various perspectives to gain a comprehensive understanding of risk-taking behavior in the venture capital industry.

8. Further Research

While this master's thesis provides valuable insights into the relationship between early-life experiences and risk-taking behavior among venture capitalists, there are several avenues for further research that could enhance our understanding of this complex phenomenon. This section highlights two potential directions for future studies.

Firstly, conducting this study with a larger sample size would offer a more comprehensive analysis and increase the statistical power of the findings. Despite our best efforts to collect a substantial amount of data over a six-month period, the sample size in this study was limited. A larger sample would allow for more robust statistical analyses and provide a broader representation of the venture capital industry. Additionally, a larger sample size would facilitate subgroup analyses, allowing for a deeper exploration of specific demographics or subsections within the venture capital landscape.

Secondly, future research could consider employing panel data analysis to examine the long-term effects of early-life experiences on risk-taking behavior among venture capitalists. By following individuals over time, panel data analysis enables the exploration of temporal dynamics and the assessment of how the effects of early-life experiences evolve as venture capitalists progress in their careers. This longitudinal approach would provide insights into whether the influence of early-life experiences intensifies or diminishes over time and shed light on the trajectories of risk-taking behavior in the venture capital industry.

Furthermore, it would be beneficial for future research to explore additional dimensions of early-life experiences and their potential impact on risk-taking behavior. While this study focused on the role of fatal disaster experiences, there may be other significant events or circumstances during childhood that could shape risk preferences and behavior in the venture capital context. Exploring these alternative dimensions, such as exposure to economic downturns, political instability, or social disruptions, could offer a more comprehensive understanding of the underlying mechanisms driving risk-taking behavior among venture capitalists.

In conclusion, this master's thesis opens up new avenues for future research in the field of venture capital and risk-taking behavior. By expanding the sample size, utilizing panel data analysis, and exploring additional dimensions of early-life experiences, researchers can further deepen our understanding of the complex dynamics and determinants of risk-taking behavior in the venture capital industry. These future endeavors will contribute to the growing body of literature and provide valuable insights for practitioners and policymakers in the field of venture capital.

9. Conclusion

This study examines the relationship between venture capitalists' early-life exposure to natural disasters and their risk-taking behavior, specifically in terms of syndication, staging, and late-stage investment decisions. The findings reveal a non-monotonic relationship, highlighting the importance of considering the intensity and nature of early-life experiences when examining risk-taking attitudes. The results support the hypothesis that VCs who have experienced fatal disasters without extreme negative consequences exhibit a higher propensity for risk-taking, while those who have witnessed the extreme downside of disasters tend to be more cautious in their approach.

Controlling for various factors, including fixed effects for VC total number of investments, VC birth year, real income, and state of birth, the analysis mitigates the influence of cohort effects and highlights the direct link between VC risk attitudes and corporate policies. The inclusion of these fixed effects ensures that differences in risk preferences due to factors such as geographic location, cultural influences, and changing economic conditions over time are properly accounted for.

Furthermore, the study acknowledges the potential impact of unobserved heterogeneity by considering the non-linear relationship between expected fatality rates from disasters in the VC's birth county and their disaster experiences. By effectively randomizing VC's residual experience of disasters over a 10-year

period, the analysis captures the nuanced effects of disaster experiences on risk-taking attitudes.

Through robustness tests, control variables, and fixed effects, the study demonstrates that natural disasters serve as an exogenous shock, and the injuries incurred during these events play a distinctive role in determining the timing of venture capital investments. Armed with this understanding, an extended analysis provides additional depth by examining continuous measurements of early-life experiences. In particular, the analysis establishes a causal link between venture capitalists' exposure to natural disasters and the injuries they bring during their early life, and their inclination towards making late-stage investments. This finding is particularly intriguing as it uncovers a relationship that has not been previously documented in the literature. This novel insight opens up avenues for further research and presents an exciting opportunity for future scholars and academics to study this association more directly and delve deeper into the underlying mechanisms at play.

The results are consistent across various models and withstand the inclusion of additional control variables. The analysis reveals interesting relationships between risk-taking behavior and variables such as investments, income, age, and gender. While some relationships show statistical significance, others do not, suggesting the need for further exploration and potentially the inclusion of additional variables in future research.

Overall, the study provides valuable insights into the complex relationship between early-life disaster experiences and risk-taking behavior among VCs. The findings contribute to the existing literature by highlighting the importance of considering non-linear effects and the intensity of life experiences when examining risk attitudes. The implications extend beyond VCs to the broader field of investor experiences and portfolio allocation, suggesting that exploring nonlinearities in life experiences and risk-taking could yield further promising avenues for research.

The study acknowledges its limitations, including the potential influence of unobserved factors and the need for further research to account for additional

variables that may affect risk-taking behavior. Nonetheless, the analysis sheds light on the significance of early-life experiences in shaping risk attitudes and provides a foundation for future studies to delve deeper into the multifaceted nature of risk-taking among VCs.

10. Reference List

Angel Investor Definition and How It Works. (2022, March 22). Investopedia. https://www.investopedia.com/terms/a/angelinvestor.asp

Assets Under Management (AUM): Definition, Calculation, and Example. (2022, March 13). Investopedia. https://www.investopedia.com/terms/a/aum.asp

BERNILE, G., BHAGWAT, V., & RAU, P. R. (2017, January 12). What Doesn't Kill You Will Only Make You More Risk-Loving: Early-Life Disasters and CEO Behavior. *The Journal of Finance*, *72*(1), 167–206. https://doi.org/10.1111/jofi.12432

Brander, J. A., Amit, R., & Antweiler, W. (2002, September). Venture-Capital Syndication: Improved Venture Selection vs. The Value-Added Hypothesis. *Journal of Economics <Html_Ent Glyph="@Amp;" Ascii="&Amp;"/> Management Strategy*, *11*(3), 423–452. https://doi.org/10.1111/j.1430-9134.2002.00423.x

Braun, R., & Stoff, I. (2016, February 17). The Cost of Private Equity Investing and the Impact of Dry Powder. *The Journal of Private Equity*. https://doi.org/10.3905/jpe.2016.2016.1.050

BSc, CEPF®, T. T. (n.d.). *Assets Under Management (AUM) | Meaning, Factors, & Formula*. Finance Strategist. https://www.financestrategists.com/wealth-management/assets-under-management/

Casamatta, C., & Haritchabalet, C. (2007, July). Experience, screening and syndication in venture capital investments. *Journal of Financial Intermediation*, *16*(3), 368–398. https://doi.org/10.1016/j.jfi.2007.03.003

Chen, Y., Fan, Q., Yang, X., & Zolotoy, L. (2021, June). CEO early-life disaster experience and stock price crash risk. *Journal of Corporate Finance*, *68*, 101928. https://doi.org/10.1016/j.jcorpfin.2021.101928

Cheong, C. S., Tan, G., & Zurbruegg, R. (2021, March). Risk-Relevant Early Life Experiences and Individual Trading Activity. *Finance Research Letters*, *39*, 101569. https://doi.org/10.1016/j.frl.2020.101569

Chircop, J., Johan, S., & Tarsalewska, M. (2020, June). Does religiosity influence venture capital investment decisions? *Journal of Corporate Finance*, *62*, 101589. https://doi.org/10.1016/j.jcorpfin.2020.101589

Cochrane, J. H. (2005, January). The risk and return of venture capital. *Journal of Financial Economics*, *75*(1), 3–52. https://doi.org/10.1016/j.jfineco.2004.03.006

Cumming, D., & Johan, S. A. B. (2008, October). Preplanned exit strategies in venture capital. *European Economic Review*, *52*(7), 1209–1241. https://doi.org/10.1016/j.euroecorev.2008.01.001

Dry Powder: Definition, What It Means in Trading, and Types. (2020, March 24). Investopedia. https://www.investopedia.com/terms/d/drypowder.asp

Elango, B., Fried, V. H., Hisrich, R. D., & Polonchek, A. (1995, March). How venture capital firms differ. *Journal of Business Venturing*, *10*(2), 157–179. https://doi.org/10.1016/0883-9026(94)00019-q

EWENS, M., & RHODES-KROPF, M. (2015, May 11). Is a VC Partnership Greater Than the Sum of Its Partners? *The Journal of Finance*, *70*(3), 1081–1113. https://doi.org/10.1111/jofi.12249

Fama, E. F., & French, K. R. (1993, February). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, *33*(1), 3–56. https://doi.org/10.1016/0304-405x(93)90023-5

Fama, E. F., & French, K. R. (2015, April). A five-factor asset pricing model. *Journal of Financial Economics*, *116*(1), 1–22. https://doi.org/10.1016/j.jfineco.2014.10.010

Ferrary, M. (2010, September). Syndication of Venture Capital Investment: The Art of Resource Pooling. *Entrepreneurship Theory and Practice, 34*(5), 885–908. https://doi.org/10.1111/j.1540-6520.2009.00356.x

Ferrary, M. (2010, September). Syndication of Venture Capital Investment: The Art of Resource Pooling. *Entrepreneurship Theory and Practice*, *34*(5), 885–908. https://doi.org/10.1111/j.1540-6520.2009.00356.x

Gilligan, J., & Wright, M. (2020, December 10). *Private Equity Demystified: An Explanatory Guide*.

GOMPERS, P. A. (1995, December). Optimal Investment, Monitoring, and the Staging of Venture Capital. *The Journal of Finance*, *50*(5), 1461–1489. https://doi.org/10.1111/j.1540-6261.1995.tb05185.x

Historical Inflation Rates: 1914-2023. (2008, July 24). US Inflation Calculator | Easily Calculate How the Buying Power of the U.S. Dollar Has Changed From 1913 to 2023. Get Inflation Rates and U.S. Inflation News. https://www.usinflationcalculator.com/inflation/historical-inflation-rates/

Huang, L., & Pearce, J. L. (2015, July 16). Managing the Unknowable. *Administrative Science Quarterly*, *60*(4), 634–670. https://doi.org/10.1177/0001839215597270

KAPLAN, S. N., & SCHOAR, A. (2005, August). Private Equity Performance: Returns, Persistence, and Capital Flows. *The Journal of Finance*, *60*(4), 1791–1823. https://doi.org/10.1111/j.1540-6261.2005.00780.x

Malmendier, U., & Nagel, S. (2011, February). Depression Babies: Do Macroeconomic Experiences Affect Risk Taking?*. *The Quarterly Journal of Economics*, *126*(1), 373–416. https://doi.org/10.1093/qje/qjq004

MALMENDIER, U., TATE, G., & YAN, J. (2011, September 21). Overconfidence and Early-Life Experiences: The Effect of Managerial Traits on Corporate Financial Policies. *The Journal of Finance*, *66*(5), 1687–1733. https://doi.org/10.1111/j.1540-6261.2011.01685.x

MALMENDIER, U., TATE, G., & YAN, J. (2011, September 21). Overconfidence and Early-Life Experiences: The Effect of Managerial Traits on Corporate Financial Policies. *The Journal of Finance*, *66*(5), 1687–1733. https://doi.org/10.1111/j.1540-6261.2011.01685.x

Manigart, S., De Waele, K., Wright, M., Robbie, K., Desbrières, P., Sapienza, H. J., & Beekman, A. (2002, July). Determinants of required return in venture capital investments: a five-country study. *Journal of Business Venturing*, *17*(4), 291–312. https://doi.org/10.1016/s0883-9026(00)00067-7

Nelson, K. (1993, January). The Psychological and Social Origins of Autobiographical Memory. *Psychological Science*, *4*(1), 7–14. https://doi.org/10.1111/j.1467-9280.1993.tb00548.x

O'Sullivan, D., Zolotoy, L., & Fan, Q. (2021, May 22). CEO early-life disaster experience and corporate social performance. *Strategic Management Journal*, *42*(11), 2137–2161. https://doi.org/10.1002/smj.3293

Risk | FINRA.org. (2023, May 24). Risk | FINRA.org. https://www.finra.org/investors/investing/investing-basics/risk

Ruhnka, J. C., & Young, J. E. (1991, March). Some hypotheses about risk in venture capital investing. *Journal of Business Venturing*, *6*(2), 115–133. https://doi.org/10.1016/0883-9026(91)90014-5

Tian, X. (2011, July). The causes and consequences of venture capital stage financing. *Journal of Financial Economics*, *101*(1), 132–159. https://doi.org/10.1016/j.jfineco.2011.02.011

Van Leuven, A. J. (2020, July 11). *Historical U.S. County Population Data: 1900 to 2010 | Andrew J. Van Leuven, Ph.D.* Andrew J. Van Leuven, Ph.D. https://andrewvanleuven.com/post/countypopulations/

Wang, L., & Wang, S. (2012, June). Endogenous networks in investment syndication. *Journal of Corporate Finance*, *18*(3), 640–663. https://doi.org/10.1016/j.jcorpfin.2012.03.004

Wang, S., & Zhou, H. (2004, January). Staged financing in venture capital: moral hazard and risks. *Journal of Corporate Finance*, *10*(1), 131–155. https://doi.org/10.1016/s0929-1199(02)00045-7

What is venture capital and how does it work? (n.d.). What Is Venture Capital and How Does It Work? | PitchBook. https://pitchbook.com/blog/what-is-venture-capital