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Venture Capital Financing and Entrepreneurial Innovation: Pathways to Economic Transformation

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Abstract
This article explores the transformative role of venture capital financing in fostering entrepreneurial innovation and its implications for economic growth and technological advancement. By analyzing historical and contemporary practices, the study examines how venture capital enables startups to overcome financial constraints and scale innovations in high-risk, high-reward industries. The paper highlights key mechanisms such as staged financing, syndication, and strategic guidance, emphasizing their role in shaping innovative ecosystems. However, it also addresses the limitations of venture capital, including its short-term focus and uneven funding distribution. Through case studies and theorsetical insights, the article underscores the critical interplay between venture capitalists and entrepreneurs, revealing how their alignment or discord can influence innovation trajectories. The findings advocate for a balanced approach that mitigates inherent risks while maximizing the potential of venture capital to drive technological and economic transformation.

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1. Introduction

1.1. Background

The famed venture capitalist, Marc Andreessen famously said “Over the next 10 years, I expect many more industries to be disrupted by software, with new world-beating Silicon Valley companies doing the disruption in more cases than not” (Sahoo, 2017) [70].

Venture capital drives the rapid growth and influence of some of the world's most dynamic companies (Lerner & Nanda, 2020) [48]. For instance, in May 2020, seven of the top eight publicly traded companies by market capitalization had received venture capital funding before their initial public offerings, including Alphabet, Apple, Amazon, Facebook, and Microsoft in the United States, as well as Alibaba and Tencent in China. More broadly, while venture-backed firms account for less than 0.5 percent of new businesses launched annually in the U.S., they make up nearly half of the entrepreneurial companies that successfully go public (Lerner & Nanda, 2020) [48].

Scholars and industry experts have clearly outlined the advantages of the venture capital model. These include a strong focus on governance by venture capital investors, who actively engage with their portfolio companies through staged financing, contractual agreements, and direct involvement. (Arrow, 1995) [1] even remarked that "venture capital has done much more, I think, to improve efficiency than anything."

The venture capital industry stands out as a beacon of optimism in an increasingly challenging global innovation landscape (Lerner & Nanda, 2020) [48]. Over the past decade, venture capital investors have significantly increased the amount of capital deployed globally, and the number of startups receiving funding has surged.

New financial intermediaries, including accelerators, crowdfunding platforms, and "super angels," have emerged to support early-stage venture finance. At the same time, mutual funds, hedge funds, corporations, and sovereign wealth funds have injected substantial capital into more mature, yet still private, venture capital–backed firms (SWF, 2024) [76].

In this paper, I acknowledge the power of venture capital in driving innovation. However, despite the optimism expressed by Ken Arrow in the earlier quote and echoed by many academics and practitioners, I argue that venture capital financing has notable limitations in advancing substantial technological change. While my ability to assess the social welfare impact of venture capital is still developing, I hope that this discussion will stimulate further exploration and research into these issues.

This paper starts by exploring the expansion of the venture capital industry over the past four decades, highlighting how technological advancements and institutional shifts have led to a more concentrated investment focus among venture capital firms. I then explore potential modifications to the venture capital model that could enable a wider range of ideas and technologies to secure risk capital. I will specifically propose several possibilities for modifying the seemingly rigid and standardized contracts between venture capital funds and their investors, as well as suggest potential strategies for more effectively managing venture investments in certain industries in Zambia.

1.2. A Gaze into the Development of Institutional Venture Capital and Innovation

1.2.1 The Birth of Venture Capital in the USA

For centuries before the advent of the modern venture capital industry, entrepreneurs have sought funding to support their risky ventures. In fact, many core aspects of today's venture capital industry, like risk-sharing partnerships, can be traced back to Genoese merchants in the 15th century and American whaling voyages in the 19th century (Astuti, 1970; De Roover, 1963; Lopez & Raymond, 1955; Nicholas, 2019) [2, 15, 51, 59].

Americans have shown a tremendous enthusiasm for technological innovation (Hughes, 1989; Smil, 2005) [33, 73]. In the final two decades of the 19th century, emerging science-based firms began to establish internal R&D laboratories (Mowery & Rosenberg, 1989; Noble, 1977) [54, 61]. These laboratories signaled an acknowledgment that their business models relied on developing new products and processes through scientists and engineers. Despite the rise of corporate research labs, independent inventors continued to innovate. However, Lamoreaux & Sokoloff (2007) [44] found a decline in independent inventors during the late 19th century, partly due to the increasing difficulty inventors faced in securing external financing. While this financial challenge is a valid explanation, it is also possible that the technological trajectories in mechanical, electrical, and chemical fields driving this surge of entrepreneurship no longer created opportunities favorable for new firm formation.

In the late 19th century, as banks became more professionalized, they were increasingly reluctant to invest in early-stage ventures. (Lamoreaux et al., 2006) [43] found that formal financial institutions played a supportive or secondary role, with venture capital being primarily mobilized through informal channels. Their findings likely extend beyond Cleveland, Ohio, or specific industries. The research suggests that while banks use available data to assess lending risk, venture capitalists must evaluate uncertainties related to the entrepreneurial team's skills, market conditions, and technology. These skills are fundamentally different. Bankers recognized this distinction and separated their fiduciary responsibilities from their personal willingness to invest in entrepreneurs.

The early automotive industry highlights how informal investors played a crucial role in supporting entrepreneurs. Although there is no extensive study on this topic, discovered that automobile entrepreneurs often secured funds from friends, family, and local prominent individuals. In the Midwest, especially Detroit, successful business people were eager to invest in emerging firms. In contrast, financiers in the eastern regions were hesitant to back early-stage automobile startups. This demonstrates the critical role local investors played in funding entrepreneurs (Kenney, 2011) [38].

As the automobile industry expanded and matured, a new industry, aviation, emerged and eventually had a more direct impact on the development of venture capital (Kenney, 2011) [38]. Like the early automobile pioneers, the initial aviators were often tinkerers, building planes from parts similar to those used in early automobiles. However, as aviation progressed into aerospace, the complexity and technical sophistication of airplanes increased. Government-supported military aviation began to provide research funding and an initial market for small firms working on advanced technology.

In the decades leading up to World War II, the aviation industry attracted wealthy enthusiasts who were passionate about flying and sought financial returns. For instance, although initially self-funded, the Wright Brothers, after their historic flight, garnered investments from affluent East Coast families and financiers like the Cabots, Cornelius Vanderbilt, August Belmont, and Russell and Frederick Alger (Rae, 1965) [65]. The excitement surrounding aviation, combined with relatively low entry barriers and ongoing technological advancements, ensured a steady stream of entrepreneurs leaving established aviation companies to start new ventures. In aviation, there were early experiments with VC-like organizations. For example, in 1926, Daniel Guggenheim created a $2.5 million fund (later increased by an additional $500,000) to promote “the whole art and science of aeronautics and aviation [and] to bring about such an advance in the art that private enterprise will find it practicable and profitable to ‘carry on’” (Lomask, 1964) [50]. In 1927, the fund provided a $150,000 loan to the first US airline, Western Airlines, which was so successful that within one year it was repaid. The fund invested in various projects meant to catalyze aviation as an industry, thus performing functions akin to those of venture capital in certain respects (Kenney, 2011) [38].

During the Great Depression, Laurance S. Rockefeller began making investments similar to venture capital. One of his initial investments was participating in the 1938 refinancing of Captain Eddie Rickenbacker’s Eastern Airlines. In 1938, J. S. McDonnell Jr., an airplane designer from the Glenn L. Martin Aircraft Company, founded a new firm in St. Louis with support from Laurance Rockefeller (Time Magazine, 1946) [80]. By 1940, just before the US entered World War II, Laurance requested permission from his father to sell some oil stocks from his trust fund to invest further in aviation industry firms. He explained in a letter, “I have already invested almost $100,000 in various small companies in the

aeronautics industry. As a result, the Assistant Secretary of the Navy, Mr. James Forrestal, has asked me to organize a company to help his department manage and finance certain companies they are particularly interested in and need assistance with" (Rockefeller, 1940) [48]. While his father's response isn't documented, it is likely he permitted Laurance to use his trust fund. Laurance Rockefeller identified a profitable niche in aviation and, specifically, in firms supplying the military, which turned out to be quite lucrative. With the onset of World War II, the aviation industry saw a dramatic surge in profitability (Rae, 1965) [65]. As wartime demand skyrocketed, not only did major prime contractors reap benefits, but small electronics and scientific instrument companies like Hewlett Packard and Raytheon also flourished. The military's need for enhanced speed and performance drove a demand for increasingly sophisticated technology, where price was not the primary concern. Building the comprehensive sociotechnical systems centered around aircraft required ground control, antiaircraft targeting systems, radar, in-flight control, and fire control—all dependent on advanced electronics. Small, innovative firms with specialized technical capabilities that could produce unique components or test systems found lucrative opportunities with large prime defense contractors. These contractors, operating under "cost-plus" federal contracts, purchased these high-tech products at steep mark-ups, yielding significant returns for the firms' investors. Consequently, aviation and related sectors, particularly those involving electronics, emerged as a prominent field for early venture capital investments.

1.3. The Dawn of VC Firms from 1946 to the Mid-1950s

At the end of World War II, the United States emerged as the world's most powerful, wealthy, and technologically advanced nation. Innovations like radar and atomic bombs had made a significant impact, as did German advances in rockets and jet fighters. Fueled by a strong belief in the potential of science and technology, President Franklin D. Roosevelt in 1945 tasked Vannevar Bush, then President of the Carnegie Foundation, with a report on how to leverage the new scientific and technological knowledge to boost the postwar economy and spark the creation of new enterprises and industries. By doing so, Roosevelt embraced a Schumpeterian vision. In response, (Bush, 1945) [10] delivered his report, *Science: The Endless Frontier*, expressing his confidence that technological and scientific research would drive the postwar economy forward.

By advocating for support and investment in small firms, Bush expressed a strong belief in the potential for profitable opportunities within small technology-based companies (Kenney, 2011) [38]. His influential report, which highlighted how scientific research could drive economic gains, perfectly captured the optimism of Boston area academic administrators and business leaders. They were convinced that commercializing university research through new firms could spark local economic recovery and that the technologies rapidly developed during the war could be sources of great wealth. This wasn't just empty talk. For instance, Hewlett-Packard, founded in 1938, saw its revenue grow from $106,458 in 1941 (Malone, 2007) [52] to over $1 million by 1945 (Malone, 2007) [52]. Despite the promise of technology-based startups, few individuals or organizations were willing to invest in high-risk new firms or provide expansion capital to existing ones.

In the immediate aftermath of World War II, a few groundbreaking venture capital (VC) firms emerged. In Boston, American Research and Development (ARD) was founded by civic, corporate, and university leaders such as Vannevar Bush, Karl Compton, Ralph Flanders, and General Georges Doriot of Harvard Business School. ARD raised capital through investments from mutual funds (then called "investment trusts"), insurance companies, and an initial public stock offering. With these funds, ARD began investing in small firms, including several spinouts from MIT (D. Hsu & Kenney, 2005) [32].

At the same time, in New York, Laurance Rockefeller, John H. Whitney, and Whitney's sister Joan Whitney Payson established their own professional VC operations. The New York-based family funds were driven not only by Schumpeterian ideas but also by a sense of civic responsibility and a belief in the profitability of venture investing (Reiner, 1989) [66].

The pioneers understood that a venture capital (VC) firm needed to offer not just funding but also financial and managerial advice and other forms of support to its portfolio companies. Their goal was to professionalize what had previously been an informal and often charitable investment practice, which had traditionally suffered from high loss rates and emotional investment (Kenney, 2011) [38].

Bringing this vision to commercial success posed significant challenges. Key questions included: How should a VC firm raise capital? What should support its routine operations while awaiting investment returns? Should it invest in startups or established firms seeking expansion capital? Which sectors—technology, retail, manufacturing, real estate—were likely to yield returns that justified the risks? How should investments be selected?

Additionally, the pioneers faced numerous operational challenges. They needed to determine the optimal organizational structure for the VC firm, the ideal backgrounds for VC professionals, strategies for managing relationships with portfolio firms, and appropriate compensation methods for venture capitalists. Some solutions developed by these early firms proved effective and enduring, while others were short-lived.

From 1946 to about 1957, the four pioneering venture capital (VC) firms, along with a few intermittent investors, achieved some success in VC investing (Kenney, 2011) [38]. However, the market remained relatively unattractive to new entrants. This was largely because three of the firms were private and did not disclose their results, while ARD had only a few minor successes. By 1956, an observer would have been justified in believing that the U.S. national science and innovation (NSI) landscape was dominated by large, established firms such as AT&T, DuPont, General Motors, and IBM, with their extensive research laboratories, and that this dominance would likely remain unchallenged. At that time, venture capital was barely on the radar, despite the emergence of numerous small technology-driven firms across the country.

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1.4. The late 1950s through 1970: industry emergence

Starting in the mid-1950s, a range of technological, political, and financial events—some interconnected and others not—transformed the landscape of venture investing, drawing new entrants into the field. Certain events made venture capital more appealing by altering the context, while others directly impacted the feasibility of investing. Additionally, the proactive actions of venture capitalists themselves enhanced the investment environment.

One pivotal event that reshaped the context was the USSR's launch of Sputnik in October 1957, sparking the Space Race (Department Of State, 2008) [19]. This created a surge in demand for lightweight components like transistors, computers, and scientific instruments. In response, the Department of Defense established the Defense Advanced Research Projects Administration (DARPA, formerly ARPA) in 1958 to fund defense-related research, particularly in aerospace, electrical engineering, and computer science (Dennis, 2024) [18]. While the Department of Defense had previously supported university and corporate research, DARPA unleashed a torrent of funding.

Sputnik-driven investments had two significant impacts on the venture capital industry. Firstly, they vastly expanded the market for high-value, cutting-edge electronics, which were often developed by new specialist firms staffed by skilled engineers and scientists. Secondly, the surge in research funding led to the establishment of many independent computer science departments in universities during the 1960s. This funding fostered new inventions and technologies and supported a large number of graduate students, who then entered the burgeoning electronics industry as researchers, executives, and founders.

The rise in purchasing and funding was closely tied to the technological advancements in electronics, particularly in computers, components, and software. These advances were crucial as entrepreneurs leveraged them to build new firms capable of rapid growth (Dosi, 1984) [20]. The most significant trajectory in this area was the development of silicon-based semiconductors, which, following Gordon Moore's Law, experienced a consistent doubling of processing power approximately every two years. This progress was mirrored by advancements in magnetic data storage and, later, data communications systems throughput.

These technological improvements, which led to more powerful, compact, and affordable computers, were essential for innovation. The increasing modularity of computing hardware and software, which began during this period, also played a key role in fostering entrepreneurship (Baldwin & Clark, 2000) [4]. Modularity allowed new component firms to thrive and enabled entrepreneurs to build computers from off-the-shelf parts, lowering entry barriers for new ventures at both the component and system levels (Langlois & Robertson, 1995) [45]. Clayton Christensen's study of the hard disk drive industry exemplifies this trend, showing how new classes of computers created by emerging firms facilitated the entry of new hard disk drive makers, all of which were supported by venture capital.

Although not ultimately profitable, Arnold Beckman's 1955 VC-like investment in the Palo Alto startup Shockley Semiconductor had a profound impact on the development of Silicon Valley. Disagreements with Shockley led eight of his engineers to found their own company, which attracted the attention of an East Coast investment banking firm. This firm persuaded Sherman Fairchild, heir to the IBM fortune, to invest $3 million in the new venture, which was named Fairchild Semiconductor.

Fairchild Semiconductor quickly became successful and grew rapidly. Its impact on Silicon Valley was twofold. First, it was instrumental in pioneering the use of silicon for semiconductors. Second, it generated a wave of new entrepreneurs and invigorated the region's entrepreneurial spirit. Fairchild alumni went on to establish new firms, and their ventures attracted funding from emerging venture capitalists. The successes of these firms led to substantial capital gains, benefiting both entrepreneurs and investors.

1.5. The Private Equity Boom

The 1980s are often associated with the rise of leveraged buyouts (LBOs) more than any other decade. This era brought the public's attention to how private equity could influence major companies, introducing terms like "corporate raiders" and "hostile takeovers" into the popular lexicon. The decade culminated in one of the largest private equity booms, highlighted by the 1989 leveraged buyout of RJR Nabisco.

In January 1982, former U.S. Secretary of the Treasury William E. Simon, Ray Chambers, and a group of investors, later known as Wesray Capital Corporation, acquired Gibson Greetings, a greeting card producer, for $80 million, with only $1 million reportedly contributed by the investors. By mid-1983, just sixteen months after the acquisition, Gibson completed a $290 million IPO, and Simon earned around $66 million. This success drew significant media attention to the emerging leveraged buyout boom.

Despite frequent failures due to high leverage, the promise of substantial returns from successful deals continued to attract capital. The surge in leveraged buyout activity and investor interest led to the establishment of numerous private equity firms during the mid-1980s. Notable firms founded in this period include Bain Capital, Chemical Venture Partners, Hellman & Friedman, Hicks & Haas, The Blackstone Group, Doughty Hanson, BC Partners, and The Carlyle Group.

The notable successes of the venture capital industry in the 1970s and early 1980s, exemplified by companies like DEC, Apple, and Genentech, led to a significant increase in venture capital firms (Powers, 2012) [64]. At the beginning of the 1980s, there were just a few dozen firms; by the end of the decade, that number had surged to over 650, all in pursuit of the next major breakthrough. Despite this proliferation, the total capital managed by these firms grew modestly, by only 11%, from $28 billion to $31 billion throughout the decade.

However, the industry's growth was tempered by declining returns, with some venture firms beginning to report losses for the first time. The initial public offering (IPO) market cooled in the mid-1980s and collapsed following the 1987 stock market crash. Additionally, foreign corporations, particularly from Japan and Korea, began flooding early-stage companies with capital. In response, many venture capital firms focused on their technology expertise by acquiring more mature companies within the industry

(Powers, 2012) [64].

Starting around 1992, three years after the RJR Nabisco buyout, the private equity industry experienced a remarkable resurgence that continued through the end of the decade. After a decline from 1990 to 1992, private equity began to expand significantly, raising approximately $20.8 billion in investor commitments in 1992 and peaking at $305.7 billion by 2000. This growth outpaced nearly every other asset class. During the 1990s, private equity gained a new level of legitimacy and respectability. Unlike the often unwelcome and unsolicited acquisitions of the 1980s, private equity firms in the 1990s shifted their focus to making buyouts appealing to both management and shareholders (Jovanovic et al., 2020) [35].

Unlike the leveraged buyout industry, which saw a significant increase in total capital raised to $3 billion in 1983 (Powers, 2012) [64], venture capital growth was more restrained through the 1980s and early 1990s. By 1994, the total capital raised by venture capital firms had only slightly increased to just over $4 billion (Neumann, 2015) [58].

However, the late 1990s marked a period of explosive growth for venture capital. Firms on Sand Hill Road in Menlo Park and throughout Silicon Valley experienced a surge of interest in emerging Internet and computer technologies. The abundance of initial public offerings for technology and growth companies led to substantial returns for venture firms. High-profile technology companies backed by venture capital during this time included Amazon.com, America Online, eBay, Intuit, Macromedia, Netscape, Sun Microsystems, and Yahoo! (Mui, 2024; Mũya, 2020) [55, 56].

The bursting of the dot-com bubble in 2000 dealt a severe blow to the venture capital industry, as startup Technology Company valuations plummeted. The Nasdaq Composite index plunged 77% from its peak on March 10, 2000, to October 4, 2002, marking the end of a historic speculative high-tech bubble (Goldman Sacks, 2019; Johansen & Sornette, 2000) [25, 34]. This crash reverberated throughout the venture capital sector, forcing many firms to write off substantial portions of their investments, leaving numerous funds deeply "underwater" (Hayes, 2024) [28].

In the two years following the dot-com bubble burst, the venture capital industry underwent a significant contraction. By mid-2003, the industry had shrunk to roughly half of its 2001 capacity (Hayes, 2024) [28]. The collapse was largely driven by technology startups that had raised funds and gone public without solid business plans or viable products. When capital dried up, these companies quickly burned through their cash reserves and ultimately failed, leading to a broader market crash (Hayes, 2024) [28].

The 2000 stock market crash was directly triggered by the bursting of the dot-com bubble. The rapid growth of the Internet generated enormous excitement among investors, leading them to pour money into startups with sky-high valuations but little to no profits. However, when the influx of capital slowed and these companies lacked the self-sustaining profits needed to survive, the bubble burst, and the market crash followed.

Despite this downturn, the post-boom years, though representing only a fraction of the peak venture investment levels reached in 2000, still marked an increase compared to the investment levels seen from 1980 through 1995.

As 2003 began, private equity entered a five-year resurgence, culminating in the completion of 13 of the 15 largest leveraged buyouts in history and unprecedented levels of investment activity. This boom was fueled by a combination of decreasing interest rates, loosening lending standards, and regulatory changes for publicly traded companies.

The passage of the Sarbanes-Oxley Act in 2002, following corporate scandals like Enron, played a significant role in this resurgence. The legislation, officially known as the Public Company Accounting Reform and Investor Protection Act, imposed stricter regulations on public companies. While it aimed to protect investors and improve corporate transparency, many public company executives found the additional compliance costs and bureaucracy burdensome, especially given the existing focus on short-term earnings over long-term value creation. As a result, for the first time, many large corporations began to view private equity ownership as more attractive than remaining public. However, Sarbanes-Oxley had the opposite effect on the venture capital industry. The increased compliance costs made it nearly impossible for venture capitalists to take young companies public, drastically reducing opportunities for exits via IPO.

2. Venture Capital Financing: An Overview

Venture capital financing serves as a vital lifeline for young, promising entrepreneurs, offering more than just financial support to small or startup firms (Ndesaulwa et al., 2017) [57]. As noted by (Sichie & Bohnstedt, 2013) [72], this form of financing is marked by a complex and often secretive exchange of information, with the venture capitalists maintaining strict control over standards, processes, and logistics. Venture capital firms, according to (Ollor & Dagogo, 2009) [62], possess unique characteristics that set them apart in the financial landscape. Their success hinges on their ability to invest in businesses that can thrive in a competitive market and generate substantial profits (Njama, 2013) [60]. Despite being relatively small players in the broader financial ecosystem, venture capital firms play a significant role in global employment by financing entrepreneurs who drive innovation and create jobs across various industries.

From a hypothetical perspective, many startups begin with the ambition of evolving into large, successful organizations. However, this aspiration remains elusive for many entrepreneurs, as evidenced by the fact that over 70% of newly established SMEs do not survive their first five years (Kaplan & Lerner, 2016) [37]. To tackle this formidable challenge, venture capital serves as an important financial intermediary. It addresses the gaps faced by emerging SMEs by navigating the various levels of risk and uncertainty that these young firms encounter. Through its support, venture capital aims to bridge these gaps, providing not just financial resources but also strategic guidance to help startups overcome obstacles and achieve long-term growth.

Venture capitalists deploy financial capital to startups using three distinct methods: upfront financing, staged financing, and syndication financing (Wang & Zhou, 2003). Each method has its own characteristics and implications for both the investor and the entrepreneur.

In upfront financing, the venture capitalist provides the entire funding amount in one lump sum at the outset (Cherif & Elouaer, 2014). This approach offers a clear and immediate boost to the startup but comes with its own set of considerations. According to (De Vita et al., 2014), during the initial evaluation phase, venture capitalists face a crucial decision: to either commit the funds or retract. Once the

decision for upfront financing is made, the venture capitalist is locked into the commitment, unable to withdraw support without significant repercussions. This method places the venture capitalist's decision under intense scrutiny and requires them to be confident in their initial assessment of the project's potential. Upfront financing thus demands a high level of trust and due diligence, as the investor's commitment is both immediate and total.

Staged financing offers a contrasting approach to upfront financing by addressing some of its inherent concerns through structured governance and ongoing evaluation. Rather than disbursing the entire amount of funding at once, staged financing involves providing capital in increments over time. This method allows venture capitalists to periodically review the startup's performance and progress, ensuring that funds are being utilized effectively and that the firm is meeting its milestones (Bygrave & Timmons, 2012). This iterative process of monitoring and evaluation provides venture capitalists with the flexibility to adjust their support based on the startup's evolving needs and achievements (Beck & Demirguc-Kunt, 2006).

Syndication, the third method of venture capital financing, is particularly prevalent during periods of economic uncertainty or turbulence (Deli & Santhanakrishnan, 2010). In a syndicated funding arrangement, multiple venture capital firms collaborate to invest in a single startup or a group of startups. This collective approach helps spread the risk and share the responsibilities associated with the investment (Syed et al., 2012). Syndication not only mitigates individual risks but also addresses constraints related to human resources and cash flow within each venture capital firm. By pooling their resources and expertise, syndicated investors can provide more comprehensive support to startups while sharing both the potential rewards and risks of the investment.

2.1. The Investment Process

Numerous studies have explored the nuances of venture capital financing, each contributing valuable insights into the field. After reviewing a range of articles and comparing them with field research conducted on German and British venture capital funds, it became evident that the study by (Tyebjee & Bruno, 1984) offers the most robust theoretical framework. Their research, which analyzed data from 41 venture capital funds involving a total of 90 deals, aligns closely with the findings from the field research.

(Tyebjee & Bruno, 1984) propose a comprehensive model that divides the venture capital process into five distinct phases:

2.1.1. Deal Origination

This initial phase involves identifying and sourcing potential investment opportunities. It is crucial for venture capitalists to build a network and establish connections that will help in discovering promising startups (Tyebjee & Bruno, 1984). These sources occur as following: cold calls 25%, referrals 65%, and active search 10% (Tyebjee and Bruno, 1984).

2.1.2. Screening

In the second phase of the venture capital process, known as screening, investors focus on narrowing down the overwhelming number of investment requests they receive to a manageable and promising subset (Kollmann & Kuckertz, 2010). Given the high volume of potential opportunities, it is crucial for investors to apply broad objective screening criteria to filter these opportunities effectively.

This phase involves applying a set of criteria that may vary among investors but often includes factors such as the investor's familiarity with the technology, product, and market of the proposed venture (Tyebjee & Bruno, 1984). Other important considerations during this phase include the size of the investment, the stage of the startup (e.g., seed, early-stage, growth), and the geographical location of the company. By using these criteria, venture capitalists can efficiently identify which opportunities align with their investment focus and strategic goals, thus streamlining their decision-making process and concentrating their efforts on the most promising ventures.

2.1.3. Evaluation

According to (Tyebjee & Bruno, 1984), the evaluation phase stands in contrast to the more objective deal origination and screening phases by involving a deeper, more subjective analysis. While the initial phases focus on filtering opportunities based on broad criteria and preliminary assessments, the evaluation phase requires a detailed and nuanced examination of each business opportunity (Kollmann & Kuckertz, 2010).

During this phase, investors rigorously assess various aspects of the startup, including its business model, market potential, competitive landscape, and the capabilities of its management team. This thorough analysis is inherently subjective and can vary significantly from one investor to another, depending on their individual perspectives, experiences, and expertise.

Following the evaluation, the investor faces a critical decision: whether to proceed to the deal phase and formally invest in the startup. This decision hinges on the findings from the evaluation phase and whether the investor is convinced of the startup's potential and alignment with their investment strategy.

2.1.4. Structuring

This phase involves negotiating the terms of the investment. Venture capitalists work on structuring the deal, including the investment amount, equity stake, and other terms that will govern the relationship between the investor and the startup.

The deal phase includes negotiating the terms of the contract, including the compensation for the entrepreneur (Baker and Gompers, 1999) and the specifics of the financing structure. This may involve various forms of financing, such as convertible securities, which can offer flexibility and alignment between the investor and the startup (Cornelli and Yosha, 1997). protective covenants are established to address potential agency problems and ensure that the interests of investors and entrepreneurs are aligned (Admati and Pfleiderer, 1994). These covenants help mitigate agency costs by setting clear guidelines and safeguards that govern the relationship between the parties, thus reducing the risk of conflicts and ensuring a smoother investment process (Gompers, 1995).

2.1.5. Post-Investment Activities

After the investment is made, venture capitalists engage in ongoing monitoring and support. This phase includes overseeing the startup's progress, providing strategic guidance, and helping the company navigate challenges to ensure successful growth.

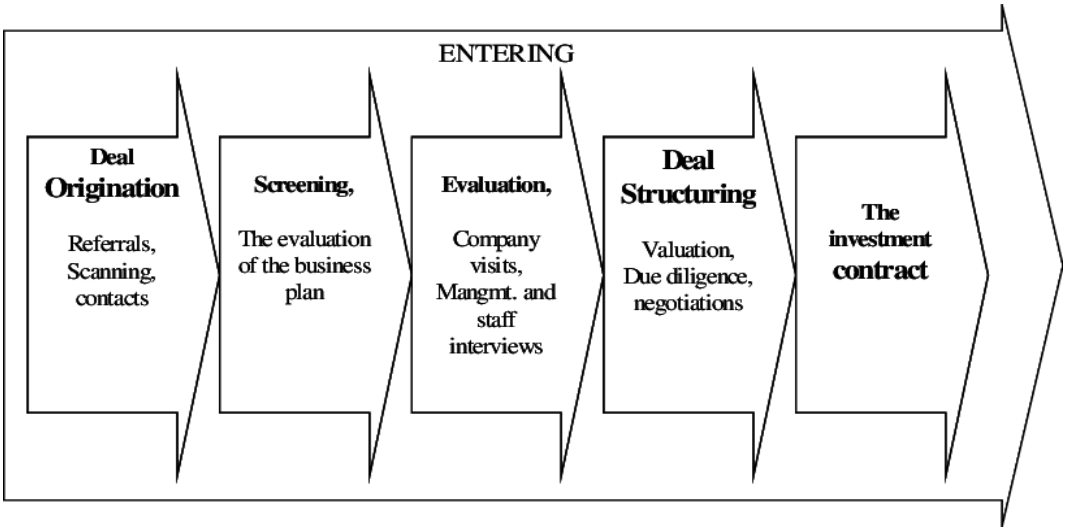

Fig 1: Tyebjee and Bruno (1984) Investment Process

3. Entrepreneurial Innovation: Concepts and Dynamics

Innovation, derived from the Latin word *innovare*, meaning "into new," is fundamentally about doing something different. While the term is widely used in the business world, it often carries connotations of risk, expense, and significant time investment (Costello & Prohaska, 2013). At its core, innovation can be defined as the introduction of new ideas, products, devices, or novel concepts. It embodies a mindset that looks beyond the present and envisions the future.

For companies, innovation is crucial. When applied effectively, it can serve as a process, strategy, and management technique, driving business success (Kuczmarski, 2003). Innovation involves generating and integrating ideas to create connections between current achievements and past experiences, with the aim of solving future problems. This process is often linked to technological advancements and plays a vital role in shaping the global economy (Baskaran & Mehta, 2016). In the competitive business environment, innovation is a key driver of sustainable value creation. It is intricately linked to job creation, profitability, and improving standards of living. By fostering innovation, companies not only strengthen their market positions but also contribute to broader economic and social progress.

Innovation is often associated with the introduction of new products, materials, processes, services, and organizational structures. However, despite its frequent use, the term lacks a universally accepted definition, leading to overlapping interpretations. This ambiguity presents a challenge, as a clear definition of innovation is essential for developing effective strategies to foster innovation (Baregheh et al., 2009).

In response to this issue, Baregheh et al (2009) proposed a comprehensive and multi-stage definition of innovation:

> *"Innovation is the multi-stage process whereby organizations transform ideas into new or improved products, services, or processes, in order to advance, compete, and differentiate themselves successfully in their marketplace."*

This definition emphasizes the transformative nature of innovation and its role in enabling organizations to maintain a competitive edge in dynamic markets. By recognizing innovation as a process that spans multiple stages, this definition provides a framework for businesses to systematically approach and implement innovative practices. Innovation serves as a powerful gateway to introducing products and services in diverse and dynamic markets by transcending traditional time horizons. It operates through a series of automatic disruptions, which are often mediated by governments, institutions, and academic bodies. These disruptions contribute to the creation of "self-operative" and "self-corrective" ecosystems, where innovation processes tend to self-regulate and adapt with minimal external intervention (Sprinkle, 2003; Teece, 2007).

As products evolve through continuous innovation, they not only reignite customer interest but also enhance their market prospects, leading to better sales and extended product life cycles. For instance, entrepreneurs might revitalize older products by adding new features or redesigning their appearance, thereby keeping them relevant in the market. However, for such innovative initiatives to thrive, it is crucial that commercial freedoms are protected and guaranteed (Sprinkle, 2003; Teece, 2007). These freedoms allow businesses to create, deploy, and safeguard intangible assets, which are essential for sustaining long-term innovation and competitive advantage.

Innovations, when coupled with entrepreneurial networks or ecosystems, equip the economy with dynamic capabilities that foster continuity and resilience. Entrepreneurs, leveraging their advanced learning skills and novel approaches, are adept at identifying and creating opportunities within evolving markets (Biggs et al., 2010; Garnsey et al., 2006; Garnsey & Leong, 2008; Kantarelis, 2009). These markets are constantly invigorated by disruptions arising from entrepreneurial ventures, necessitating the replacement of outdated products with newer, more innovative ones. Through this process, entrepreneurs not only adapt to changes but also drive the economy forward, ensuring that it remains vibrant and responsive to emerging trends and demands.

3.1. Innovation: The Creative Process

The creative process serves as a crucial link between creativity and innovation, with the goal of producing something of value that can be traded, developed, and commercially exploited. (Cropley et al., 2011) advocate for

the term "value innovation" to more accurately describe this interconnected process, as it explicitly reflects the operative environment where creativity and innovation converge. They view the relationship between creativity and innovation as a dual process, where both elements work in tandem to produce outcomes that have tangible value.

Klein & Tremblay (2016) explore this connection within the context of urban, social, and cultural development, suggesting that creation precedes innovation and that innovation is contingent upon the social acceptance of creative outputs and the dissemination of their effects and results. In this context, the commercial drive is less of a motivating factor in the processes of creation and innovation. They argue that the link between creativity and innovation should not be confined to a linear model (Klein & Tremblay, 2016). A linear interpretation overlooks the myriad other pathways through which creative activities and innovation can emerge, including spontaneous, random, or unstructured processes.

The debate around who possesses the capacity for creativity further complicates this discussion. Some theorists argue that only certain individuals or groups within society are inherently creative (Florida, 2005; Sternberg, 2005), while others assert that everyone has the potential to be creative (Markusen, 2006; Runco, 2004). If we accept that creativity is a universal human trait and that the processes involved are highly context-dependent, it follows that creative activity and innovation can manifest in countless ways. These processes are limited only by individual and contextual factors, which vary widely and cannot be easily categorized or predicted. This perspective broadens our understanding of how creativity and innovation interrelate, highlighting the importance of an open, flexible approach to fostering innovation. It underscores the notion that creativity and innovation are not confined to structured processes but can arise in diverse, sometimes unpredictable, ways.

4. The Relationship between Venture Capital and Innovation

Enterprises often face significant challenges when investing in innovation, primarily due to the long research and development (R&D) cycles and the high risks associated with bringing new products or services to market (Han et al., 2023). These hurdles can be daunting, especially for companies with limited capital reserves. The entry of venture capital into this equation can be a game-changer, as it provides not only the necessary financial resources for R&D but also value-added services, such as consulting and management supervision. Venture capital firms leverage their industry expertise, functional knowledge, and resource endowments to help companies enhance their innovation performance (Han et al., 2023).

However, the relationship between venture capital and innovation is not without its complexities. Venture capital firms typically have specific investment objectives and cycles that prioritize short-term returns. This focus on quick gains can sometimes clash with the inherently long-term nature of innovation activities, which require sustained investment and patience. As a result, there is a risk that venture capital might suppress corporate technological innovation if the pressure to achieve short-term financial goals overshadows the need for continued investment in R&D.

This raises a critical question, Does venture capital ultimately promote or inhibit business innovation? While venture capital can provide crucial support for innovation by addressing capital shortages and offering strategic guidance, its influence can also be double-edged. The impact of venture capital on innovation depends on how well the goals of the investors align with the long-term innovation strategies of the companies they fund. If managed carefully, venture capital can be a powerful catalyst for innovation, driving companies to new heights of technological advancement. Conversely, if the focus on short-term returns prevails, it can stifle the very innovation it seeks to support, leading to a suppression of corporate technological progress.

Innovative and entrepreneurial enterprises, being newly established, often possess highly specialized assets, leading to significant information asymmetry between the parties involved in their financing. This disparity in information can result in mutual hedging, where both entrepreneurs and venture capitalists take precautions to protect their respective interests. As a consequence, the configuration of corporate control becomes a pivotal issue, with both parties keen to ensure that their interests are safeguarded through the allocation of control rights.

Organizational control theory, particularly as it relates to the economics of innovation, suggests that the distribution of corporate control rights has a profound influence on important decisions regarding innovation within a company. This, in turn, has a significant impact on the firm's technological innovation capabilities (Xu & Xu, 2012). When venture capitalists are involved, the dynamics of corporate control become even more crucial, as the venture capitalist's influence can extend beyond mere financial investment to include ownership of equity and the right to sit on the company's board of directors.

The participation of venture capitalists in the governance of a firm can provide valuable strategic oversight and resources that enhance the firm's innovation performance. However, it also introduces a layer of complexity regarding decision-making processes and the direction of innovation efforts. Venture capitalists, with their focus on maximizing returns, may prioritize certain innovation projects that align with their financial objectives, potentially steering the company's innovation strategy in ways that might not fully align with the long-term vision of the entrepreneurs (Han et al., 2023).

Understanding the mechanisms by which venture capital affects a firm's innovation performance requires a deeper examination of how control is exercised by venture capitalists. The extent of their equity ownership and their presence on the board can significantly shape the innovation trajectory of the firm, influencing everything from R&D priorities to the commercialization of new technologies. This interplay between corporate control and innovation underscores the importance of aligning the interests of venture capitalists and entrepreneurs to foster an environment where technological innovation can thrive.

Corporate technological innovation is inherently a long and risky process, characterized by extended R&D cycles and the need for significant risk-taking. For innovation to thrive, key players involved—particularly venture capitalists—must demonstrate a strong tolerance for risk and the potential for failure (He & Tian, 2020). The ability of venture capital institutions to accommodate failures in innovation is crucial, as it reflects their willingness to support enterprises even when faced with setbacks. This tolerance towards failure can profoundly influence the corporate culture of the firms they invest in, shaping how entrepreneurs perceive and respond to

technological innovation failures (He & Tian, 2020).

The attitudes of venture capitalists towards failure play a pivotal role in determining how a firm approaches innovation. A supportive stance towards innovation failures can encourage a culture of experimentation and resilience, where entrepreneurs feel empowered to take bold steps in pursuing technological advancements. This, in turn, can significantly impact the development of innovation activities and the eventual success of innovation outcomes (Tian & Wang, 2014) [79]. When venture capitalists exhibit a high tolerance for failure, they not only mitigate the pressure on entrepreneurs to succeed at all costs but also foster an environment where continuous learning and improvement are valued.

However, this raises an important question: Does the tolerance of venture capitalists to innovation failure influence the relationship between venture capital and enterprise innovation performance? The answer appears to be yes. A venture capitalist's tolerance for failure can strengthen the relationship between venture capital and innovation performance by creating a supportive ecosystem where risk-taking is encouraged and setbacks are viewed as opportunities for growth. Conversely, if venture capitalists are overly risk-averse or intolerant of failure, this can stifle innovation, leading to a more cautious and less dynamic approach to technological advancement. This subject is important to corporate technological innovation, which was at the core of the research conducted.

4.1. Venture capital and entrepreneurship

Venture capital (VC) extends its influence far beyond macroeconomic growth and employment by playing a pivotal role in the commercialization of cutting-edge technology. The firms that benefit from VC funding are not just contributors to economic indicators; they are often at the forefront of technological advancements that redefine industries and even create entirely new ones, such as the internet and the World Wide Web. This transformative impact underscores the critical function of VC markets as a bridge between financing and innovation.

The relationship between venture capital and innovation is particularly evident in the way VC firms enable start-ups and early-stage companies to access capital markets that are specifically tailored to the high-risk, high-reward nature of their activities. These firms, often operating in nascent or rapidly evolving sectors, require substantial financial resources to develop and scale their innovative ideas. Traditional financing methods are typically inaccessible or unsuitable for such ventures due to the inherent uncertainties involved. However, venture capitalists, with their appetite for risk and their expertise in fostering entrepreneurial growth, provide the necessary funding and support that allow these companies to push the boundaries of what is possible.

The infusion of venture capital into these high-potential firms catalyzes the development and commercialization of groundbreaking technologies, driving not only the success of the individual companies but also contributing to broader economic and technological progress. By backing ventures that are willing to explore uncharted territories, venture capitalists play a crucial role in shaping the future of industries and, by extension, the global economy

Kortum & Lerner (2000) [48] provide a comprehensive analysis of the relationship between venture capital (VC) and patented inventions across twenty industries in the United States over a span of three decades. Their study reveals that venture capital plays a significant role in fostering innovation, particularly when controlling for research and development (R&D) expenditures. They find that VC-backed firms not only produce a higher number of patents but also achieve patents of greater value compared to those not financed by venture capital. This underscores the positive impact of VC on the quality and quantity of innovation.

Similarly, Samila & Sorenson (2009) [71] highlight a gap in empirical research regarding the influence of venture capital on economic growth, suggesting that the relationship between VC and innovation has not been thoroughly investigated. Their work points to the need for more systematic scrutiny of how venture capital affects economic outcomes.

Supporting these findings, Popov & Roosenboom (2012) [63] offer additional evidence that venture capital is positively related to the generation of patented inventions. Their research shows that this positive relationship is particularly pronounced in countries where the VC-to-R&D ratio is high, averaging around 3.9%. Furthermore, they find that venture capital enhances innovation more effectively in countries with lower barriers to entrepreneurship, suggesting that a conducive environment for starting and growing businesses can amplify the benefits of VC funding.

Further research by Samila & Sorenson (2009) [71] extends our understanding of venture capital's impact on innovation by examining the interplay between public funding and private financing. Their study provides compelling evidence that public funding for academic research positively influences innovation, as measured by the number of patents produced. Moreover, they find that this positive impact of public research funding becomes even more pronounced when complemented by increased venture capital investment. This suggests a significant interaction between public and private sources of funding in fostering an innovative ecosystem.

The findings from Samila and Sorenson highlight the critical role that a collaborative approach—where public research funding and private venture capital work in tandem—plays in driving technological advancements. By integrating these sources of support, the innovation environment becomes more robust and dynamic, leading to a greater output of valuable patents and innovations.

This insight points to valuable future research avenues. For instance, incorporating human capital as a variable in models could offer a deeper understanding of how educational attainment and expertise influence the effectiveness of both public and private funding in innovation. Exploring how human capital interacts with these funding sources could further elucidate the mechanisms driving successful innovation and contribute to more effective policy and investment strategies.

4.2. The Role of Venture Capital in Funding Innovations and Entrepreneurs

Venture capital serves as a crucial intermediary that is uniquely equipped to support the creation and growth of innovative, entrepreneurial companies, particularly those in their early stages of development (Hellmann & Puri, 2002; Kortum & Lerner, 2000) [48, 30]. This form of financing is especially well-suited for start-ups operating within high-tech industries, where traditional funding avenues might be inaccessible or insufficient due to the inherent risks and

uncertainties involved.

The value that venture capitalists bring to these companies extends far beyond mere financial investment. Venture capitalists offer a wealth of expertise in market dynamics, deep knowledge of the entrepreneurial process, and access to extensive networks of industry contacts. These resources are instrumental in helping start-ups unlock and realize their full growth potential (Bottazzi et al., 2004; Hellmann & Puri, 2002; Lerner, 1994, 1995; Lindsey, 2003) [9, 46, 30, 49]. This multifaceted support system is what differentiates venture capital from other forms of financing and makes it a powerful catalyst for innovation and growth.

In fact, the association with a reputable venture capitalist is so valuable that entrepreneurs are often willing to accept a lower valuation for their companies in exchange for the added benefits that such a partnership brings. Hsu (2004) [31] conducted a study on 149 start-ups and found that those linked with highly experienced investors accepted a 15 percent discount in their firm valuation. The rationale behind this discount is rooted in the expectation that venture capitalists will provide critical support beyond just funding, such as strategic guidance, mentorship, and access to a broader network, all of which are crucial for the success and scalability of a start-up.

This willingness to trade off valuation for the intangible benefits of working with experienced venture capitalists underscores the importance of the role that these investors play in shaping the trajectory of innovative enterprises. Their involvement often marks the difference between a start-up that simply survives and one that thrives, scaling new heights in an increasingly competitive and fast-paced technological landscape.

5. Venture Capital's Limitations

The rapid growth of the venture capital market over the past decade has indeed highlighted its potential as a catalyst for innovation. However, this expansion should not obscure the inherent limitations and challenges that accompany venture capital's role in driving technological advancements. As outlined previously, these challenges are likely to intensify with ongoing changes in the market and investment landscape.

5.2. There are three key areas of concern regarding the effectiveness of venture capital in fostering innovation

1. Short-Term Focus vs. Long-Term Innovation: Venture capital often emphasizes short-term returns on investment, which can sometimes conflict with the long-term nature of innovation. Start-ups and innovative projects may require extended periods to develop and mature, yet the pressure for rapid financial gains may lead to premature scaling or strategic shifts that could undermine the potential for groundbreaking innovation.
2. Risk Aversion and Investment Strategies: As the venture capital market becomes more competitive, there may be an increasing tendency toward investing in ventures that promise safer, more predictable returns rather than truly disruptive innovations. This shift could limit the support available for high-risk, high-reward projects that are essential for significant technological breakthroughs.
3. Uneven Distribution of Funding: The venture capital landscape may exhibit disparities in funding distribution, with certain regions, industries, or types of innovations receiving more attention than others. This uneven allocation can stifle diverse and potentially transformative innovations that fall outside the focus of major venture capital firms.

Given these concerns, further scholarly research is needed to explore these limitations in greater depth. Understanding how these factors affect the overall impact of venture capital on innovation can lead to more informed strategies and policies that enhance the effectiveness of venture capital in driving technological progress. Future studies should address these speculative areas to provide a clearer picture of how venture capital can better align with the goals of fostering sustained and meaningful innovation.

5.3. Future Trends and Implications

As the venture capital landscape continues to evolve, staying ahead of the curve requires more than merely keeping pace with current trends; it demands the foresight to anticipate them. In a rapidly changing environment, recognizing and understanding emerging sectors and breakthrough technologies early on is critical to capitalizing on these opportunities before they become mainstream. Venture capitalists who can accurately predict the next big innovation have the potential to shape the future of industries and reap significant rewards.

However, successfully navigating this complex and dynamic terrain requires more than just intuition. A reliable and comprehensive source of information becomes an invaluable tool in this endeavor, equipping VCs with the knowledge needed to make informed decisions. By staying informed about industry developments, technological advancements, and shifts in market dynamics, venture capitalists can approach investments with confidence and strategic foresight, positioning themselves to seize opportunities that others may overlook.

In this context, access to high-quality research, expert analysis, and real-time data becomes essential. It allows VCs to identify patterns, assess risks, and align their investment strategies with the most promising sectors. Whether it's understanding the implications of a new regulatory environment, the potential of a cutting-edge technology, or the rise of a new market, having the right information at the right time can be the difference between leading the charge in innovation or playing catch-up.

Ultimately, the ability to anticipate and act on emerging trends is what sets successful venture capitalists apart. As the industry continues to evolve, those who invest in building a strong foundation of knowledge and strategic insight will be best positioned to drive innovation and secure their place at the forefront of the venture capital landscape.

6. Conclusion

Venture capital financing plays a pivotal role in fostering entrepreneurial innovation, acting as a catalyst for the growth of startups and the commercialization of cutting-edge technologies. By providing not only financial resources but also strategic support, venture capitalists significantly influence the trajectory of innovation within high-risk, high-reward industries. The relationship between venture capital and innovation, however, is complex, characterized by both opportunities and challenges.

On one hand, venture capital offers the necessary funding and expertise to help startups overcome initial barriers and scale their innovations. The involvement of experienced investors

can lead to the development of more valuable patents, the growth of innovative ecosystems, and the commercialization of disruptive technologies that shape entire industries.

On the other hand, the pressures for rapid growth and quick returns inherent in venture capital investments can sometimes conflict with the long-term, experimental nature of innovation. The potential for these tensions highlights the importance of aligning the interests of venture capitalists and entrepreneurs to ensure sustainable innovation outcomes.

As the venture capital landscape continues to evolve, it is clear that staying ahead of emerging trends and technologies will be crucial for future success. Venture capitalists who can anticipate changes and strategically position themselves will not only drive innovation but also secure their place as leaders in an increasingly competitive market. The dynamic interplay between venture capital and entrepreneurial innovation will undoubtedly continue to shape the future of industries, economies, and societies.

7. References

1. Arrow K. Interview with Kenneth Arrow | Federal Reserve Bank of Minneapolis. Minneapolis Fed. 1995. Available from: https://www.minneapolisfed.org/article/1995/interview-with-kenneth-arrow
2. Astuti G. Origini e svolgimento storico della commenda fino al secolo XIII. Bottega d'Erasmo; 1970.
3. Atkinson R. Understanding the U.S. National Innovation System. SSRN Electronic Journal. 2014. Available from: https://www.researchgate.net/publication/321790571_Understanding_the_US_National_Innovation_System
4. Baldwin CY, Clark KB. Design Rules. Volume 1: The Power of Modularity. MIT Press; 2000.
5. Baregheh A, Rowley J, Sambrook S. Towards a multidisciplinary definition of innovation. Management Decision. 2009;47(8):1323–33. Available from: https://doi.org/10.1108/00251740910984578
6. Baskaran S, Mehta K. What is innovation anyway? Youth perspectives from resource-constrained environments. Technovation. 2016;52–53:4–17. Available from: https://doi.org/10.1016/j.technovation.2016.01.005
7. Beck T, Demirguc-Kunt A. Small and medium-size enterprises: Access to finance as a growth constraint. Journal of Banking & Finance. 2006;30(11):2931–43. Available from: https://doi.org/10.1016/j.jbankfin.2006.05.009
8. Biggs R, Westley FR, Carpenter SR. Navigating the Back Loop: Fostering Social Innovation and Transformation in Ecosystem Management. Ecology and Society. 2010;15(2):art9. Available from: https://doi.org/10.5751/ES-03411-150209
9. Bottazzi L, Da Rin M, Hellmann T. The changing face of the European venture capital industry: Facts and analysis. The Journal of Private Equity. 2004;7(2):26–53.
10. Bush V. Science: The Endless Frontier A Report to the President. United States Government Printing Office; 1945.
11. Bygrave WD, Timmons JA. Venture Capital at the Crossroads. Harvard Business School Press; 2012.
12. Cherif M, Elouaer S. Venture Capital Financing: A Theoretical Model. Journal of Applied Business and Economics. 2014;1(1):43–56.
13. Costello T, Prohaska B. Innovation. IT Professional. 2013;15(3):64. Available from: https://doi.org/10.1109/MITP.2013.42
14. Cropley DH, Kaufman JC, Cropley AJ. Measuring Creativity for Innovation Management. Journal of Technology Management & Innovation. 2011;6(3):13–30. Available from: https://doi.org/10.4067/S0718-27242011000300002
15. De Roover R. The Organization of Trade. In: The Cambridge Economic History of Europe: Volume III: Economic Organization and Policies in the Middle Ages. Cambridge University Press; 1963. Available from: https://www.cambridge.org/core/books/abs/cambridge-economic-history-of-europe-from-the-decline-of-the-roman-empire/organization-of-trade/AAB6382F5015062E79C60F37EE584237
16. De Vita L, Mari M, Poggesi S. Women entrepreneurs in and from developing countries: Evidences from the literature. European Management Journal. 2014;32(3):451–60. Available from: https://doi.org/10.1016/j.emj.2013.07.009
17. Deli DN, Santhanakrishnan M. Syndication in Venture Capital Financing. Financial Review. 2010;45(3):557–78. Available from: https://doi.org/10.1111/j.1540-6288.2010.00261.x
18. Dennis MA. Defense Advanced Research Projects Agency (DARPA). Encyclopedia Britannica. 2024. Available from: https://www.britannica.com/topic/Defense-Advanced-Research-Projects-Agency
19. Department of State. The Launch of Sputnik, 1957. Department of State. 2008 Apr 18. Available from: https://2001-2009.state.gov/r/pa/ho/time/lw/103729.htm
20. Dosi G. Technical Change and Industrial Transformation. St. Martins Press; 1984.
21. Florida R. Cities and the Creative Class. Psychology Press; 2005. Available from: https://www.routledge.com/Cities-and-the-Creative-Class/Florida/p/book/9780415948876?srsltid=AfmBOooaIUxADmFRpw8K6Ny1lpnCUuBLpgbtWC4akMEjORF6AEJHGUnV
22. Garnsey E, Leong YY. Combining Resource-Based and Evolutionary Theory to Explain the Genesis of Bio-networks. Industry and Innovation. 2008;15(6):669–86. Available from: https://doi.org/10.1080/13662710802565271
23. Garnsey E, Stam E, Heffernan P. New Firm Growth: Exploring Processes and Paths. Industry & Innovation. 2006;13(1):1–20. Available from: https://doi.org/10.1080/13662710500513367
24. Gold S. A Brief History of Venture Capital. OpenVC Blog. 2022. Available from: https://www.openvc.app/blog/history-of-venture-capital
25. Goldman Sachs. The Late 1990s Dot-Com Bubble Implodes in 2000. Goldman Sachs History Moments. 2019. Available from: https://www.goldmansachs.com/our-firm/history/moments/2000-dot-com-bubble
26. Gompers P, Lerner J, Scharfstein D. Entrepreneurial Spawning: Public Corporations and the Genesis of New Ventures, 1986 to 1999. The Journal of Finance. 2005;60(2):577–614. Available from: https://doi.org/10.1111/j.1540-6261.2005.00740.x
27. Han J, Chen M, Chen Y, Jing Q, Wang S. The study on

the relationship between venture capital, tolerance to failure, and enterprise innovation performance. Frontiers in Psychology. 2023;14:1133324. Available from: https://doi.org/10.3389/fpsyg.2023.1133324
28. Hayes A. Dotcom Bubble Definition. Investopedia. 2024. Available from: https://www.investopedia.com/terms/d/dotcom-bubble.asp
29. He J, Tian X. Institutions and Innovation: A Review of Recent Literature. SSRN Electronic Journal. 2020. Available from: https://doi.org/10.2139/ssrn.3530214
30. Hellmann T, Puri M. Venture Capital and the Professionalization of Start-Up Firms: Empirical Evidence. The Journal of Finance. 2002;57(1):169–97. Available from: https://doi.org/10.1111/1540-6261.00419
31. Hsu DH. What Do Entrepreneurs Pay for Venture Capital Affiliation? The Journal of Finance. 2004;59(4):1805–44. Available from: https://doi.org/10.1111/j.1540-6261.2004.00680.x
32. Hsu D, Kenney M. Organizing venture capital: The rise and demise of American Research & Development Corporation, 1946–1973. Industrial and Corporate Change. 2005;14:579–616.
33. Hughes T. American Genesis: A Century of Invention and Technological Enthusiasm 1870–1970. Viking Press; 1989.
34. Johansen A, Sornette D. The Nasdaq Crash of April 2000: Yet Another Example of Log-Periodicity in a Speculative Bubble Ending in a Crash. Physics of Condensed Matter. 2000;17. Available from: https://doi.org/10.1007/s100510070147
35. Jovanovic B, Ma S, Rousseau PL. Private Equity and Growth. SSRN Electronic Journal. 2020.
36. Kantarelis D. Entrepreneurship in the USA: Architecture, market structure and incentives. International Journal of Entrepreneurship and Innovation Management. 2009;9(3):191–203.
37. Kaplan SN, Lerner J. Venture Capital Data: Opportunities and Challenges. NBER Working Paper Series. 2016;Working Paper 22500.
38. Kenney M. How venture capital became a component of the US National System of Innovation. Industrial and Corporate Change. 2011;20(6):1677–723. Available from: https://doi.org/10.1093/icc/dtr061
39. Klein JL, Tremblay DG. Cultural creation and social innovation as the basis for building a cohesive city. In: Shearmu R, Carrincazeaux C, Doloreux D, editors. Handbook on the Geographies of Innovation. Edward Elgar Publishing; 2016. Available from: https://doi.org/10.4337/9781784710774.00047
40. Kollmann T, Kuckertz A. Evaluation uncertainty of venture capitalists' investment criteria. Journal of Business Research. 2010;63(7):741–47.
41. Kortum S, Lerner J. Assessing the Contribution of Venture Capital to Innovation. The RAND Journal of Economics. 2000;31(4):674. Available from: https://doi.org/10.2307/2696354
42. Kuczmarski TD. What is innovation? And why aren't companies doing more of it? Journal of Consumer Marketing. 2003;20(6):536–41. Available from: https://doi.org/10.1108/07363760310499110
43. Lamoreaux NR, Levenstein M, Sokoloff KL. Mobilizing venture capital during the Second Industrial Revolution: Cleveland, Ohio, 1870–1920. Capitalism and Society. 2006;1(3).
44. Lamoreaux NR, Sokoloff KL. Financing Innovation States, 1870 to the Present. MIT Press; 2007.
45. Langlois RN, Robertson PL. Firms, Markets, and Economic Change: A Dynamic Theory of Business Institutions. Routledge; 1995.
46. Lerner J. Venture capitalists and the decision to go public. Journal of Financial Economics. 1994;35(3):293–316. Available from: https://doi.org/10.1016/0304-405X(94)90035-3
47. Lerner J. Venture Capitalists and the Oversight of Private Firms. The Journal of Finance. 1995;50(1):301–18. Available from: https://doi.org/10.1111/j.1540-6261.1995.tb05175.x
48. Lerner J, Nanda R. Venture Capital's Role in Financing Innovation: What We Know and How Much We Still Need to Learn. HBS Working Papers. 2020. Available from: https://www.hbs.edu/ris/Publication%20Files/20-131_fc73af76-3719-4b5f-abfc-1084df90747d.pdf
49. Lindsey L. The Venture Capital Keiretsu Effect: An Empirical Analysis of Strategic Alliances Among Portfolio Firms. SSRN Electronic Journal. 2003. Available from: https://www.researchgate.net/publication/228593578_The_Venture_Capital_Keiretsu_Effect_An_Empirical_Analysis_of_Strategic_Alliances_Among_Portfolio_Firms
50. Lomask M. Seed Money: The Guggenheim Story. Farrar, Straus and Company; 1964.
51. Lopez RS, Raymond IW. Medieval Trade in the Mediterranean World: Illustrative Documents. Columbia University Press; 1955.
52. Malone MS. Bill & Dave: How Hewlett and Packard Built the World's Greatest Company. Portfolio/Penguin; 2007.
53. Markusen A. Urban Development and the Politics of a Creative Class: Evidence from a Study of Artists. Environment and Planning A: Economy and Space. 2006;38(10):1921–40. Available from: https://doi.org/10.1068/a38179
54. Mowery DC, Rosenberg N. Technology and the Pursuit of Economic Growth. Cambridge University Press; 1989.
55. Mui. The Dream of the 90's, Part III: Boom Goes the Fixed Investment. Employ America. 2024 Feb 5. Available from: https://www.employamerica.org/researchreports/the-dream-of-the-90s-part-iii-boom-fixed-investment/
56. Mũya PH. Taking a Peek at Venture Capital in the 90s. LinkedIn. 2020. Available from: https://www.linkedin.com/pulse/taking-peek-venture-capital-90s-peter-m%C5%A9ya-h
57. Ndesaulwa A, Kikula J, Chao E. Investigation of Barriers to SMEs Innovation Capacity in Tanzania: Can Technology and R&D Mitigate Their Effects? Journal of Business and Management Sciences. 2017;5:11–7. Available from: https://doi.org/10.12691/jbms-5-1-2
58. Neumann J. Heat Death: Venture Capital in the 1980s. Reaction Wheel. 2015 Jan. Available from: https://reactionwheel.net/2015/01/80s-vc.html
59. Nicholas T. VC: An American History. Harvard University Press; 2019.
60. Njama GJ. Effect of venture capital financing on the

growth of small and medium-sized enterprises in Kenya. Unpublished Manuscript. 2013.
61. Noble D. America by Design; Science, Technology, and the Rise of Corporate Capitalism. Knopf; 1977.
62. Ollor WG, Dagogo DW. The Effect of Venture Capital Financing on the Economic Value Added Profile of Nigerian SMEs. SSRN Scholarly Paper. 2009. Available from: https://papers.ssrn.com/abstract=1534211
63. Popov A, Roosenboom P. Venture capital and patented innovation: Evidence from Europe. Economic Policy. 2012;27(71):447–82. Available from: https://doi.org/10.1111/j.1468-0327.2012.00290.x
64. Powers J. The History of Private Equity Venture Capital. Corporate LiveWire. 2012. Available from: https://www.corporatelivewire.com/top-story.html?id=the-history-of-private-equity-venture-capital
65. Rae JB. Financial problems of the American aircraft industry, 1906–1940. Business History Review. 1965;Spring:99–114.
66. Reiner ML. The transformation of venture capital: A history of the venture capital organizations in the United States [Ph.D. dissertation in Business Administration]. University of California; 1989.
67. Rockefeller Archive. Laurance S. Rockefeller, 1910–2004. Rockefeller Archive Center. 2006. Available from: https://rockarch.org/resources/about-the-rockefellers/laurance-s-rockefeller/
68. Rockefeller LS. Letter from Laurance S. Rockefeller to John D. Rockefeller, Jr. Unpublished Correspondence. 1940.
69. Runco MA. Creativity. Annual Review of Psychology. 2004;55(1):657–87. Available from: https://doi.org/10.1146/annurev.psych.55.090902.141502
70. Sahoo D. 10 Tech Investing Quotes From the World's Best Venture Capitalists. LinkedIn. 2017. Available from: https://www.linkedin.com/pulse/10-tech-investing-quotes-from-worlds-best-venture-deb
71. Samila S, Sorenson O. Venture Capital, Entrepreneurship, and Regional Economic Growth. SSRN Electronic Journal. 2009. Available from: https://doi.org/10.2139/ssrn.1183576
72. Sichie A, Bohnstedt A. East Africa Private Equity Confidence Survey Report. Deloitte. 2013.
73. Smil V. Creating the 20th Century: Technical Innovations of 1867–1914 and Their Lasting Impact. Oxford University Press; 2005.
74. Sprinkle RH. The biosecurity trusts. BioScience. 2003;53(3):270–7.
75. Sternberg R. The Theory of Successful Intelligence. Revista Interamericana de Psicología. 2005;39. Available from: https://doi.org/10.1177/026142940001500103
76. SWF. Sovereign Wealth Funds, Venture Capital and Uncertainty. International Forum of Sovereign Wealth Funds. 2024. Available from: https://www.ifswf.org/general-news/sovereign-wealth-funds-venture-capital-and-uncertainty
77. Syed AASG, Ahmadani MM, Shaikh N, Shaikh FM. Impact Analysis of SMEs Sector in Economic Development of Pakistan: A Case of Sindh. Journal of Asian Business Strategy. 2012;2(2):44–53.
78. Teece DJ. Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. Strategic Management Journal. 2007;28(13):1319–50. Available from: https://doi.org/10.1002/smj.640
79. Tian X, Wang TY. Tolerance for Failure and Corporate Innovation. Review of Financial Studies. 2014;27(1):211–55. Available from: https://doi.org/10.1093/rfs/hhr130
80. Time Magazine. Rock Bros., Inc. Time Magazine. 1946.
81. Tyebjee TT, Bruno AV. A Model of Venture Capitalist Investment Activity. Management Science. 1984;30(9):1051–66. Available from: https://doi.org/10.1287/mnsc.30.9.1051
82. Wang S, Zhou HF. Staged Financing in Venture Capital: Moral Hazard and Risks. SSRN Electronic Journal. 2003. Available from: https://doi.org/10.2139/ssrn.385080
83. Xu N, Xu XY. The duality of control right incentive and the dynamic ability of technological innovation: An empirical analysis based on panel data of high tech listed companies. China Ind. Econ. 2012;10:109–21. Available from: https://doi.org/10.19581/j.cnki.ciejournal.2012.10.010