

# Decision-making Criteria and Challenges: An Analysis of Business Angels and Venture Capitalists in Sweden's Life Science Startup Ecosystem

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## Abstract

The Swedish life science sector is a pivotal contributor to the nation's innovation and economic development, offering vast potential for growth and value creation within the global healthcare landscape. However, navigating the investment terrain to actualise this potential requires strategic capital infusion, primarily through venture capital (VC) and business angel (BA) investments. This study aims to explore the key decision-making criteria and challenges of BAs and VCs when evaluating life science ventures for investment in Sweden. It addresses the gap in understanding the investor's standpoint, detailing the key factors influencing their investment choices and the challenges they face within the Swedish innovation ecosystem.

This study uses a qualitative research methodology to gather insights from nine semi-structured interviews with a select group of BAs and VCs actively engaged in Sweden's life science sector. The objective is to unravel the complex decision-making landscape, identifying the criteria that drive investment decisions and the barriers that potentially hinder the practical application of these criteria.

In this study, several key decision-making criteria used by BAs and VCs are uncovered, encompassing aspects such as risk appetite, science and technology evaluation, financial viability, milestone achievement, adaptability, trust building, networking, guidance and mentorship, and vision alignment. Additionally, it highlights several challenges confronting investors, including regulatory complexities, geographical difficulties, ecosystem influences, and Swedish-specific life science hurdles. These barriers affect the investment process and shape BAs and VCs' strategies and preferences in their pursuit of successful venture engagements.

By providing a nuanced understanding of the investment dynamics from the perspective of BAs and VCs, this research contributes valuable insights into the operational frameworks of capital provision in Sweden's life science sector. The findings offer practical implications for existing and prospective investors, enhancing their strategic approaches to investment in life science ventures. The study also lays a foundation for future research to refine further and expand the knowledge base on investment decision-making in the life science sector, ultimately fostering a more vibrant and sustainable innovation ecosystem in Sweden and beyond.

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# Chapter 1: Introduction

## 1.1 Background

The life science sector is a cornerstone in numerous global economies, and the Nordic region, especially Sweden, is no exception (Westlund et al., 2014). The life science sector in Sweden encompasses the pharmaceutical, biotechnology, medical technology, and diagnostic industries. These industries have profound implications for human and animal health, agriculture, and various industrial processes (Rehman et al., 2017). Despite the competitive nature inherent in the life science sector, entrepreneurial initiatives hold immense potential for substantial value creation and exponential growth (KPMG 2021). In recent times, Sweden has seen a marked surge of growth in the life science domain, especially in pharmaceuticals and medical technology. In a report by the Swedish Agency for Growth Policy Analysis (2018), the life science sector boasted a net turnover of SEK 164 billion in 2016, and exports reached SEK 88.9 billion. From 2014 to 2016, there was a 27% rise in net turnover, a 15% increase in exports, and a 1.7% growth in employment figures. Ventures rooted in the life science sector are vital to Sweden's economy due to their significant contributions to economic productivity (Ministry of Enterprise and Innovation, 2020). Beyond consistent revenue hikes from the top-tier life science businesses in the nation, a robust line-up of budding ventures further accelerates the growth of this sector. Furthermore, the flourishing of Sweden's life science sector can be ascribed not only to its world-class education system but also to a regulatory environment that aligns closely with EU standards. This harmonised approach with the broader European Union enhances innovation and facilitates expedited market penetration for groundbreaking products (Falk et al., 2023).

Sweden's dedication to life science research is deeply rooted in its impressive history of Nobel laureates in Physiology or Medicine (World Bank Group, 2015). The government's commitment to research and development, academic excellence, and a spirit of entrepreneurship have crafted a robust life science ecosystem (Westlund et al., 2014). Biotechnology stands as a significant component of this ecosystem. Swedish firms have showcased innovations ranging from biomaterials and genomics to drug discovery, many of which have garnered international recognition (Falk et al., 2023).

The medical technology arena in Sweden also holds its ground, particularly in areas like medical imaging, orthopaedic devices, and digital health. Companies like Elekta and Getinge are testaments to Sweden's prowess in designing medical equipment and solutions (Gregersen & Pålsson, 2011). Pharmaceutical giants like AstraZeneca, with roots in Sweden, contribute to drug innovations and

support and collaborate with smaller biotech entities, fostering an integrated network of advancement (Ministry of Enterprise and Innovation, 2020).

Furthermore, interdisciplinary collaborations have been a hallmark of Swedish innovation, exemplified by institutions like SciLifeLab, fostering partnerships among academia, industry, and healthcare (Arvidsson et al., 2016). With its dynamic confluence of tradition and innovation, the Swedish life science sector offers a rich canvas for understanding VC and BA decision-making processes. The nation's emphasis on research, collaborative approaches, and forward-thinking attitude continue to position it at the forefront of global life science advancements.

Globally, life sciences are often conceived as disciplines that study living organisms, encompassing biology, biotechnology, and medicine (Falk et al., 2023). As Falk et al. (2023) and Swedish Agency for Growth Policy Analysis (2018) indicate, the term covers the direct study of life and extends to industries like pharmaceuticals, medical technology, and diagnostics. Within Sweden, the definition aligns closely with the global understanding. From discovering the molecular mechanisms of circadian rhythms to significant contributions to genomic research, Sweden has demonstrated consistent leadership in the life sciences (Ministry of Enterprise and Innovation, 2020).

For life science ventures to achieve noteworthy growth and value, securing capital is an imperative step for its entrepreneurs. Beyond merely propelling a venture towards success, capital acquisition is paramount for the sustained viability of a life science enterprise due to the capital-intensive nature of this sector (Angerer et al., 2017; Klačmer Čalopa et al., 2014). However, when life science entrepreneurs endeavour to garner funds, conventional financing avenues such as bank credits or debt financing are often elusive. This situation stems from the fact that, despite the promising growth trajectory of life science ventures, the intrinsic attributes of the sector, marked by volatility and risk (e.g., extended developmental timelines), make it a challenging domain (Rencher, 2012). Consequently, private equity investments facilitated by venture capitalists (VCs) and business angels (BAs) emerge as alternative financial reservoirs for entrepreneurs navigating the capital needs of their life science initiatives (Powell et al., 2005).

In the Nordic region, BAs and VCs are two paramount figures that shape the entrepreneurial fabric, each bringing its distinct characteristics and evaluation parameters to the table. VCs, typically part of structured investment entities, employ a methodological and often more conservative approach. They prioritise ventures based on tangible metrics such as investment size, venture industry, geographical positioning, and current financing stage (Hellmann et al., 2007; Smith, 2001). Further evaluation includes parameters like historical entrepreneurial engagements, the competence of the



venture's management team, market potential, product differentiation, prospective exit routes, and anticipated returns (Wiencke, 2017; Ueda, 2004; Fairchild, 2004). Conversely, BAs, which are often high-net-worth individuals, tend to have a more personalised and holistic approach than VCs. While the former assess ventures on tangible aspects like managerial expertise and exit strategies, their decision-making process places considerable weight on intangible entrepreneur characteristics such as passion, integrity, and openness to mentorship (White & Dumay, 2018). Due to their individualistic nature, they might rely on gut feeling, personal experiences, and industry insights (Bessière et al., 2019; Herrmann et al., 2016).

In the Nordic entrepreneurial ecosystem, VCs serve as professional investors, predominantly funding high-growth ventures. They usually make these investments as representatives of structured investment funds (Gullander & Napier, 2003; Hyytinen & Pajarinen, 2001). On the other hand, BAs are individuals with substantial financial assets who commit their capital to high-growth ventures, typically lacking familial ties. These BAs may operate independently or as part of formal or informal syndicates (Robinson & Phillips McDougall, 2001). In the Swedish context, startups in their nascent stages often find support from BAs. At the same time, those in more mature phases attract venture capital due to their diminished risk profile. Notably, BAs and VCs seldom vie against each other for investment opportunities within Sweden. Instead, they play complementary roles: BAs frequently pave the way for startups, priming them for subsequent VC investments (Arachchi & Nimesha, 2022; Avdeitchikova, 2008). Every life science startup engaged in capital accumulation undergoes the investment cycles characteristic of VC and BA investors, a subject well-explored in regional research (Sandström, 2014). This investment cycle, applicable to both investor types around the world, typically unfolds in stages: Pre-investment, investment, post-investment, and eventually, exit (Proimos & Wright, 2005; Salamzadeh & Kawamorita Kesim, 2015).

It becomes clear that while VCs lean towards a structured, risk-averse, and metric-oriented approach, BAs balance analytical rigour and personal judgment. The interplay between these two investor types, each with unique strengths and preferences, creates a robust and diversified financing landscape for Swedish startups. The intrinsic differences between BAs and VCs are not only their investment decisions but also their post-investment relationships with ventures, establishing a multifaceted investment ecosystem (Arachchi & Nimesha, 2022; Avdeitchikova, 2008; Westlund et al., 2014).

Sourcing capital can be challenging, especially in the Swedish ecosystem, where competition for high-quality investments can be intense (Söderblom, 2012). Prior investigations by Braunerhjelm and Svensson (2009) have suggested that entrepreneurs do not solely dictate the dynamics between

investment entities and ventures. Studies examining the determinants behind investment choices in Sweden broadly fall into two categories. The first category dwells on the intricate decision-making processes inherent within BAs and VCs (Dhochak & Sharma, 2016; Payne et al., 2009; Zacharakis & Shepherd, 2007), providing insights into their distinct investment rationales, risk appetites, and evaluation matrices. On the other hand, the second group zeroes in on the value propositions these investment entities bring to the table post-contract, addressing aspects like mentorship, networking opportunities, and strategic direction (Arachchi & Nimesha, 2022; Lindsey, 2008; Malmgren et al., 2010).

However, within this Nordic and Swedish context, a lingering question, as per Baker et al. (2020), is the deeper dive into the nuances of why BAs and VCs choose specific ventures over others.

## 1.2 Research Purpose

While there is a robust body of literature addressing the decision-making criteria of VCs globally, the depth of understanding becomes less extensive when focusing on specific sectors, such as life sciences. Furthermore, while research on BAs also exists, the granularity of insights diminishes when we concentrate on the unique innovation ecosystem of Sweden within the Nordic region. Though the global literature sheds light on the criteria used by investors across different sectors and geographies, directly extrapolating these findings to the Swedish context might not be accurate. This is especially true considering the specific characteristics and intricacies of the Swedish life science sector.

The literature's relative limitation in addressing the nuances of BAs and VCs within Sweden's life science sector illuminates the need for deeper exploration. Apart from understanding which criteria are vital, another essential aspect of this study is investigating any barriers or regional nuances that influence these investment criteria in practice. This is crucial for comprehensively understanding the investment dynamics within the Swedish life science context.

Therefore, this study aims to enhance the literature surrounding the decision-making criteria of BAs and VCs in the life sciences. Specifically, this study explores BAs and VCs' key decision-making criteria when assessing potential startups in Sweden's life science sector. This research will also investigate the challenges BAs and VCs face when assessing potential life science ventures in the Swedish innovation ecosystem as they go through the investment process.

This study intends to achieve the following aims:

1. To explore the key decision-making criteria BAs and VCs utilise in Sweden's life science sector when assessing potential startups for investment.
2. To investigate the challenges BAs and VCs face within the Swedish innovation ecosystem during the investment process in life science startups.

### 1.3 Research Question

The research question below seeks to provide a comprehensive understanding of the key decision-making criteria used by BAs and VCs in Sweden's life science sector, particularly when assessing potential startups for investment:

1. How do VCs and BAs in Sweden's life science sector approach, evaluate, and select potential startups for investment?

### 1.4 Methodology

This study employed a qualitative approach to understand investment dynamics in the Swedish life science sector. While many studies utilise quantitative surveys (Bryman et al., 2008; Johnson et al., 2006; Reid & Gough, 2000), a qualitative lens allows for a more nuanced exploration of the decision-making processes of BAs and VCs.

Considering the sector's distinctive dynamics, a mix of non-random purposive and snowball sampling techniques, encompassing participants from various VC firms and individual BAs, was used.

Data was primarily sourced through semi-structured interviews, offering flexibility while ensuring consistency in addressing research topics. These interviews covered BAs and VCs for a comparative analysis highlighting differences and similarities in investment strategies.

The gathered data underwent thematic analysis outlined by Braun & Clarke (2006), unveiling critical themes related to the investment dynamics in Sweden's life science sector.

### 1.5 Research Contribution

The academic landscape is abundant with studies exploring the key criteria BAs and VCs use when selecting life science startups for investment. However, an understanding gap still needs to be addressed regarding these criteria within the context of the Swedish life science sector. Additionally, BAs and VCs face challenges and barriers during their investment processes, which are well-documented globally. However, the Swedish market presents a unique case that has yet to be

explored in the existing literature. This study seeks to address this knowledge gap and provide insights into the unique intricacies of the Swedish life science investment scene.

From an academic relevance perspective, while many studies evaluate investment criteria across various global markets, a specific examination of the Swedish life science sector is limited, making the focus of this study both unique and necessary. Through a thorough examination, this study will determine the most suitable theoretical framework for a deeper exploration of the decision-making criteria of BAs and VCs in Sweden's life science sector. Another element of this study is its comparative perspective. Highlighting potential variations and commonalities between the approaches of BAs and VCs enriches the academic discourse and offers a layered view of the investment landscape.

Turning to practical relevance, the results of this research can be beneficial for life science startups in Sweden. By offering insights into investor preferences, startups can position themselves better to secure essential funding. For BAs and VCs, the findings can help them streamline their evaluation processes, ensuring their investment decisions are strategic and informed. Furthermore, by shedding light on the nuances of investment decisions in the life science sector, this study can foster improved interactions between startups and investors, leading to smoother negotiations and, ultimately, more successful partnerships.

## 1.6 Thesis Outline

Chapter 1 delves into the Swedish life science sector, highlighting its key industries. Chapter 2 reviews the VC and BA literature and introduces the guiding theoretical frameworks. Chapter 3 explains the research methodology employed. Chapter 4 presents the study's findings, while Chapter 5 discusses the results. Finally, Chapter 6 concludes the study, summarising findings and suggesting future research avenues.

## 1.7 Thesis Scope

While global investment in life science startups is well-studied, the unique landscape of Sweden's life science sector still needs to be explored. This research targets this gap, focusing on the decision-making criteria of BAs and VCs in Sweden when assessing potential startups for investment. Moreover, the study delves into the challenges these investors encounter within the Swedish innovation ecosystem.

Leveraging frameworks like agency theory, signalling theory, and institutional theory will help shed light on how BAs and VCs in Sweden's life science sector evaluate startups and understand the similarities and differences in how they make decisions and the barriers they face during the investment process.

From a practical perspective, the findings can offer insights for Swedish life science startups and potential investors, aiming to optimise the investment environment in Sweden's life science sector.

## Chapter 2: Literature Review

### 2.1 Business Angels

BAs, also known as informal investors, are high-net-worth individuals who invest personal funds into private businesses, typically without family connections to the venture (Cegielska, 2020). BAs play a crucial role in the funding process for new businesses, acting as a bridge between initial investments from family and friends and more significant investments from VCs (Conti et al., 2013; Conti et al., 2011). Many BAs have strong management backgrounds, having started and grown successful businesses or holding significant positions in well-established companies (Mason & Harrison, 2015; Sutrisno et al., 2023).

Drawing on their experience, BAs tend to invest in startups in familiar sectors, allowing them to provide more than just financial support. They offer valuable advice, insights, industry contacts, and mentoring, creating a supportive environment for new businesses to thrive (Shane, 2012; Sørheim, 2005). This support is instrumental in helping new entrepreneurs navigate the challenges of starting and growing a business.

### 2.2 Venture Capitalists

Venture Capitalists (VCs) are specialised investors who provide capital to startups and early-stage companies with high growth potential in exchange for equity or partial ownership of the company. They play a pivotal role in the innovation ecosystem, particularly in sectors such as biotechnology and pharmaceuticals, where they support startups that demonstrate the potential for rapid growth and introduce groundbreaking technologies and business models (Gompers & Lerner, 2001; Kortum & Lerner, 2000). The attraction for VCs lies in the startup's capacity to disrupt markets and generate substantial financial returns.

VC firms source their funds from diverse contributors, including affluent individuals and significant institutional investors like pension funds, endowments, and large corporations (Gompers & Lerner,

2004; Mayer et al., 2005). Utilising this collective pool of capital, they invest in startups that, despite their promise, are associated with high levels of risk. In exchange for their financial input, VCs typically acquire equity in these companies, becoming shareholders and acquiring a stake in their success (Lerner, 1994; Sørensen, 2007).

Startup companies in the life science sector present unique challenges, such as prolonged research phases and stringent regulatory barriers. To navigate these challenges, VC firms usually operate with funds with a lifespan of 10-12 years. This timeframe is designed to support the startup from its initial investment phase through periods of growth and culminating in a successful exit strategy. The aim for VCs is to secure substantial returns by the end of the fund's duration, which are then distributed among the contributing investors and the VC firm itself (Kaplan & Schoar, 2005; Rin & Phalippou, 2017).

## 2.3 Differences Between BAs and VCs

The investment landscape is significantly shaped by the distinctive roles and approaches of VCs and BAs, each playing a pivotal role in nurturing startups through different stages of growth. This diversity in investment strategies affects the nature of funding available to startups and the broader dynamics within the innovation ecosystem.

### 2.3.1 VCs: A Collaborative and Strategic Approach in High-Risk Sectors

VCs are particularly active in sectors like life sciences, characterised by extended research and development phases and substantial associated costs. VCs frequently engage in syndication to mitigate these inherent risks, a co-investment model that distributes investment risk across participating VCs. This collaborative effort not only diversifies risk but also pools the expertise of involved VCs, offering a collective insight crucial for the rigorous due diligence phase, thereby minimising the potential for ill-advised investments (Powell et al., 2005). VCs adopt a proactive stance, engaging in active reconnaissance by monitoring innovation hubs such as biotech startup incubators and academic research establishments to stay ahead of emergent developments within the sector (Kleyn et al., 2007; Soenksen & Yazdi, 2017).

### 2.3.2 BAs: Early Support and Risk Profile

Contrastingly, BAs are instrumental in supporting startups at their nascent stages, often stepping in before VCs typically engage (Conti et al., 2013). This early-stage support is crucial for startups that still need to mature enough to attract VC attention. Despite potential overlaps in exit strategies, BAs and VCs exhibit different attitudes toward risk. BAs, using their personal funds, are more inclined to

invest in very early ventures, embracing higher risks compared to the more cautious approach of VCs who manage other people's money (Conti et al., 2011; Puri & Zarutskie, 2012). BAs aim for financial returns and often pursue broader goals like mentoring new entrepreneurs, demonstrating a preference for close, trust-filled relationships and personalised guidance (Sort & Nielsen, 2018; Dutta & Folta, 2016).

### 2.3.3 The Relationship Between BAs and VCs

The interplay between BAs and VCs is dynamic and complementary. BAs typically invest in startups at their earliest stages, setting the foundation for these ventures to mature and become attractive to VCs, who then step in with more significant sums of money at later stages (Harrison & Mason, 2000; Johnson & Sohl, 2012). In well-developed markets, such as the United States, the rise in BA activity has led to VCs focusing more on later funding rounds, delineating more explicit roles for BAs and VCs in the startup ecosystem (Gornall & Strebulaev, 2015; Lindgaard Christensen, 2011).

This delineation of roles underscores a symbiotic relationship where BAs' early support and risk tolerance complement VCs' strategic, growth-focused investments. Together, BAs and VCs form a vital continuum of support that caters to startups across different development phases, from ideation to market entry and beyond, each bringing unique strengths and perspectives to the startup ecosystem.

## 2.4 Investment in Life sciences

In the challenging landscape of the life science sector, startups face a critical need for adequate capital to fuel growth and ensure continuity. The life science field, encompassing areas like biotechnology and pharmaceuticals, is often considered too risky by traditional financial institutions due to high uncertainty and inherent risks (Blumenthal et al., 1996). Gullander and Napier (2003) reinforce this view, highlighting the reluctance of conventional banks to finance these ventures.

Life science startups undergo various stages from conception to commercialisation, each with unique financial requirements. The early stages typically involve research, prototyping, or initial clinical trials, whereas later stages require substantial investments for large-scale clinical tests, regulatory compliance, and market entry (Bonini & Capizzi, 2019). BAs and VCs are, therefore, vital in the life sciences arena, offering the capital necessary to navigate these stages (Hellmann & Puri, 2002).

While BAs and VCs are pivotal in this sector, they differ in their investment approaches. BAs often prefer early-stage ventures, investing when the company is still defining its direction (Gompers, 1995). In contrast, with their structured approach and larger capital pools, VCs typically invest in

slightly more mature stages where the startup's potential and market trajectory are more viable (Kaplan & Stromberg, 2003). This difference in investment preferences between BAs and VCs is particularly notable in the life science sector, given its high stakes, prolonged time frames, and substantial capital needs for research and regulatory clearances (Mason & Harrison, 2002b).

Table 1 below illustrates the different stages of capital investment typically targeted by BAs and VCs. This table provides a clear overview of how investment preferences align with the developmental stages of life science startups, adapted from the New Zealand Venture Investment Fund (NZVIF, 2007).

**Table 1: The Different Stages of Capital Investment. Adapted From (NZVIF, 2007).**

Early Stage			Expansion	
Seed	Startup	Early Expansion	Expansion	Late Expansion
Capital will enable the development, testing and preparation of a product or service to the point where it is feasible to start business operations.	Capital will enable actual business operations to get underway. This includes further developing the company's product(s) and initial production and marketing.	Capital is provided to initiate or expand commercial production and marketing, but where the company is typically or likely to become cash flow negative.	Capital is provided for the growth and expansion of a company, which may or may not break even or trade profitably. Capital may be used to finance increased production capacity, market or product development, or provide additional working capital.	Capital is provided for financing the expansion of a company that is producing, distributing, and increasing its sales volume, helping a company achieve critical mass to position it for an initial public offering.
Angel Investing Stages			Venture Capital Investing Stages	

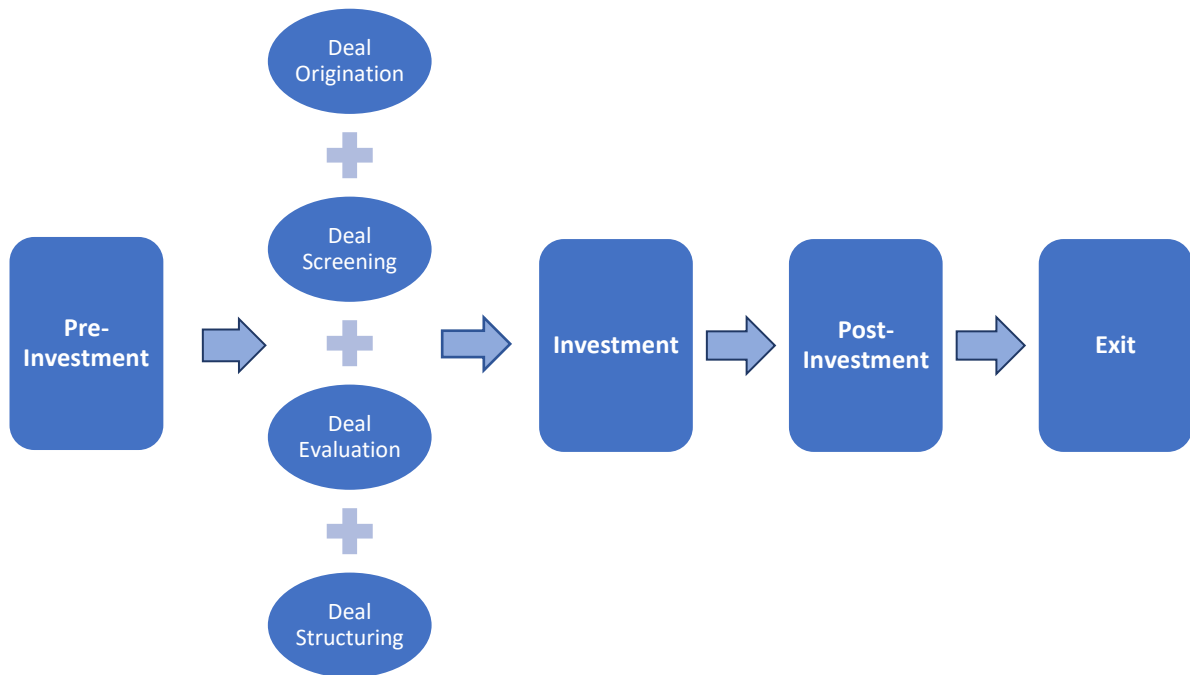
## 2.5 The Investment Process

In startup financing, the investment process is a structured journey that both BAs and VCs undertake to identify, evaluate, invest in, and exit from investment opportunities. This process is typically divided into four main stages: pre-investment, investment, post-investment, and exit. This structure is essential for maximising the startups' chances of successfully bringing innovative solutions to the market (Metrick & Yasuda, 2021; Sahlman, 1990).

The pre-investment stage is further subdivided into four integral sub-stages. The first sub-stage, deal origination, involves identifying potential investment opportunities. Metrick and Yasuda (2021) emphasise the importance of this stage in setting the foundation for the investment process. Secondly, the deal screening sub-stage entails a preliminary review of these opportunities, assessing their suitability and potential. Sahlman (1990) highlights the critical nature of this preliminary assessment in filtering viable investments. The third sub-stage, deal evaluation, is a comprehensive assessment of the shortlisted startups, focusing on their viability and alignment with the VC's



investment criteria (Yang et al., 2018). Deal structuring is the final sub-stage, where company valuations and investment terms are discussed (Wiencke, 2017). Figure 1, adapted from Metrick and Yasuda (2021), visually represents the investment process of BAs and VCs when considering investments.



**Figure 1: The Investment Process of VCs and BAs. Adapted From (Metrick & Yasuda, 2021).**

### 2.5.1 Pre-Investment Stage

The pre-investment stage is critical in the investment process, where both BAs and VCs employ rigorous strategies to identify and evaluate potential investment opportunities. This stage involves identifying potential deals, initial screening, in-depth analysis, and thorough due diligence. As highlighted by Michaeli et al. (2022), the overarching goal for VCs is to discern startups that can yield significant financial returns, with an aspiration for annualised returns ranging from 30% to 60% (Yang et al., 2018). BAs leverage their extensive informal connections, including colleagues, friends, or direct interactions with innovative entrepreneurs, to discover investment opportunities (Kirihata, 2022). They also utilise more formal avenues such as angel networks, respected referrals, and joint syndicates, which often benefit from a strict vetting process, thus increasing the likelihood of matching with the BA's specific investment criteria (Mason, 2008).

### 2.5.2 Pre-Investment: Deal Origination

Deal origination is the first sub-stage of pre-investment, where investors identify and engage with potential investment opportunities. This crucial step involves a range of activities to discover startups that align with the investor's criteria for funding. The effectiveness of deal origination can significantly influence the quality and fit of the investment portfolio, making it a foundational aspect of successful investment strategies (Metrick & Yasuda, 2021).

For BAs, deal origination often capitalises on their extensive informal networks. BAs typically discover investment opportunities through personal connections, including colleagues, friends, or direct interactions with innovative entrepreneurs (Kiriata, 2022). This approach allows BAs to leverage trust and firsthand knowledge, often leading to investments in startups that might have yet to be identified through formal channels. In addition to their personal networks, BAs also use formal avenues such as angel networks, respected referrals, and joint syndicates to widen their scope of potential deals (Mason, 2008). Combining informal and formal sources enables BAs to conduct a thorough vetting process, ensuring a better match with their investment criteria.

VCs utilise a diverse array of conduits for deal origination. Referrals are a predominant channel for VCs, offering a trusted and efficient means to identify promising startups. These referrals can come from other VCs, institutional partners, seasoned entrepreneurs, financial institutions, and prior consultants, all of which contribute to a venture's perceived lower risk (Jehan, 2021; Guenther et al., 2022). The reliance on referrals underscores the importance of trust and the network effect in the VC deal origination process. While VCs are open to direct approaches from entrepreneurs, those ventures introduced through established, credible referrals often find themselves in a more advantageous position, particularly in sectors as complex and risk-prone as life sciences (Yung, 2012).

### 2.5.3 Pre-Investment: Deal Screening

Deal screening is the second sub-stage of pre-investment, where investors conduct a preliminary review of potential investment opportunities to determine their alignment with specific investment criteria and strategic goals. This process involves evaluating various aspects of the ventures, such as their market potential, technological innovation, team capabilities, and the fit with the investor's expertise and focus areas (Sahlman, 1990). The primary aim is to filter out ventures that do not meet the set criteria, allowing investors to concentrate on the most promising opportunities.

For BAs, deal screening is often characterised by focusing on the startup's location, industry, and the potential for the BA to add value post-investment through their expertise or connections. BAs employ a personal approach to this process, considering factors that align with their investment

strategies and the areas where they can offer the most significant impact (Croce et al., 2016). This stage is crucial for BAs as it sets the groundwork for more detailed evaluations and ensures that the ventures they choose to invest in can benefit from their unique contributions (Mason, 2008).

VCs face unique challenges during the deal-screening phase due to the sector's inherent complexities and high R&D costs. VCs assess whether a life sciences venture aligns with their overarching investment strategy, often influenced by their prior successful investments and the firm's specific focus areas (Karsai et al., 1998; Zacharakis & Shepherd, 2007). The screening process for VCs is exhaustive, as they consider the amount invested, the venture's R&D intensity, and its potential to reach significant milestones. VCs rely heavily on their in-depth industry knowledge to navigate the sector's nuances, preferring to invest in areas where they can offer more than just financial support (Gompers & Lerner, 2001; Cummings & MacIntosh, 2003; Kaplan & Stromberg, 2003; Metrick & Yasuda, 2021). The emphasis is on identifying ventures that not only promise groundbreaking technologies or address urgent medical needs but also align with the VC's evaluation criteria and strategic goals (Lerner, 2012; Dubini, 1989).

#### 2.5.4 Pre-Investment: Deal Evaluation

Deal evaluation is the third sub-stage in the pre-investment process, where investors conduct an in-depth assessment of the ventures that have passed the initial screening. This critical evaluation aims to thoroughly understand the venture's business model, team capabilities, market potential, financial projections, and overall alignment with the investor's goals. The goal is to mitigate risks, ensure the venture's viability, and establish the foundation for a successful partnership (Yang et al., 2018).

For BAs, the deal evaluation process is highly personalised and reflective of their investment philosophies and the unique value they bring to a venture. BAs conduct a detailed assessment focusing on the entrepreneur's passion, trustworthiness, business acumen, management skills, and past achievements (Giglio, 2021; White & Dumay, 2018). Their diverse backgrounds allow BAs to view potential investments through various lenses, enabling them to identify ventures where their expertise can significantly impact the venture's success (Sørheim, 2005). The evaluation by BAs is not only about the potential financial returns but also the personal fit and the ability to contribute meaningfully to the venture's growth.

In contrast, VCs approach the deal evaluation stage with a structured and methodical process, requiring significant time and effort from both VCs and entrepreneurs. Before delving into a detailed evaluation, VCs and startups often agree on key investment terms outlined in a term sheet, which becomes the basis for any future contract (Yang et al., 2021). VCs assess various aspects of the

venture, including the team, business idea, potential risks, uncertainties, and expected return on investment (Batjargal & Liu, 2004). They consider factors such as the entrepreneur's track record, the quality of the management team, market attractiveness, product or service uniqueness, exit plan clarity, and the potential for a favourable return (Dhochak & Sharma, 2016). Personal relationships, trust, and biases towards specific entrepreneurial backgrounds can influence VCs' investment decisions (Batjargal, 2005; Gompers, 1995; Hellmann et al., 2007; Zhang & Zhang, 2021).

#### 2.5.5 Pre-Investment: Deal Structuring

Deal structuring is the fourth and final sub-stage in the pre-investment process, where investors and entrepreneurs negotiate and finalise the terms of the investment. This stage encompasses discussions on the valuation of the venture, the amount of equity or ownership the investor will receive, and the specific conditions tied to the investment. Deal structuring is pivotal because it not only influences the immediate financial architecture of the deal but also sets the groundwork for the relationship between the investor and the entrepreneur, addressing expectations, roles, and potential future earnings (Wiencke, 2017).

For BAs, deal structuring tends to focus on more informal contracts that prioritise the relationship's trustworthiness and strength. BAs' contracts are usually more straightforward, reflecting a mix of financial and personal motivations for investing. This approach facilitates a more flexible negotiation phase, allowing BAs to tailor their terms to the unique circumstances of each venture. Despite the informal nature, BA contracts still incorporate standard clauses to protect their investment, such as veto rights on significant transactions and requirements for entrepreneur consent on crucial decisions (Lindsey, 2008; Hellmann et al., 2007; Koskinen et al., 2014; Shane, 2012). When BAs invest through Business Angel Networks (BANs), the contracts become more structured, mirroring VC agreements to address the complexities of collective investments (Mason et al., 2019; Wiencke, 2017).

Conversely, VCs engage in more complex contract negotiations during the deal structuring stage. Discussions focus on accurately valuing the venture to determine the equity stake, often relying on industry practices and benchmarks (Wiencke, 2017; Félix et al., 2012). The complexity of VC contracts is driven by their primary aim for financial returns, necessitating detailed agreements that outline the investment terms, governance structures, and exit strategies. The structured nature of VC contracts reflects their strategic investment approach, ensuring that all potential risks are mitigated and that the venture is positioned for future growth or acquisition (Karaarslan et al., 2016).

### 2.5.6 Investment Stage

The Investment Stage is a pivotal phase in the venture funding process, marking the formal capital commitment to a venture following detailed negotiations and agreement on investment terms. This stage signifies a tangible financial engagement between investors and entrepreneurs, characterised by the drafting and finalising of investment contracts that outline the conditions under which capital is provided (Metrick & Yasuda, 2021).

BAs often underpin the investment stage with more informal contracts, highlighting the centrality of trust and personal relationships in their investment philosophy. BAs' preference for more straightforward contracts is influenced by a blend of financial and personal motivations for investing, which allows them to be more flexible in their contract terms (Ueda, 2004; Mason & Harrison, 2015). This flexibility often makes it easier for startups to secure subsequent funding, as VC firms tend to avoid deals with overly complex terms (Bonini et al., 2018). Despite the lack of formality, BA contracts typically contain standard clauses safeguarding their investment, including veto rights on significant transactions and consent requirements for crucial business decisions (Shane, 2012). When investing through BAs, these contracts tend to become more structured, resembling the thoroughness of VC agreements due to the collective nature of the investment (Mason et al., 2019).

Conversely, the investment stage for VCs is marked by intricate negotiations and the inclusion of strict conditions in contracts to protect their investment. These conditions aim to mitigate risks associated with the investment, including potential disputes or dishonest actions by the entrepreneur (Gilson & Black, 1996; Koskinen et al., 2011; Lindsey, 2008). VCs often employ staged investments, releasing capital in phases contingent upon the venture achieving specific milestones, and invest in convertible shares to balance protection and potential for gains (Gilson & Black, 1996; Bergemann & Hege, 1998). VCs typically seek board positions to influence the venture's strategic direction and include negative contract covenants to ensure significant decisions receive VC approval (Lindsey, 2008). Specific exit terms are also negotiated to give VCs control over the timing and method of exiting their investment (Koskinen et al., 2011).

### 2.5.7 Post-Investment Stage

The post-investment stage is a critical process in the investment lifecycle. The focus shifts from financial transactions to active involvement and value addition by the investor to the venture. During this stage, investors engage with the venture to ensure its growth, sustainability, and eventual success. The nature and intensity of this engagement can vary significantly between BAs and VCs, reflecting their distinct investment philosophies and operational strategies.

For BAs, the post-investment stage is characterised by a deep and multifaceted engagement with the venture. BAs actively immerse themselves in their investments, leveraging their skills, experience, and connections to support the venture's growth and commercial success. They act as mentors and advisors, providing hands-on guidance and access to their extensive commercial networks and industry knowledge (Malmgren et al., 2010). BAs' involvement extends to operational support in various capacities, significantly contributing to the venture's strategic direction and execution. Furthermore, BAs are crucial in facilitating additional funding rounds, showcasing their commitment to the venture's long-term success (Frias et al., 2020; Collewaert & Manigart, 2015).

Conversely, during the post-investment phase, VCs take a more structured approach to involvement with their portfolio companies. VCs provide oversight and governance and actively contribute to the venture's growth by offering strategic guidance and industry insights (Bocken, 2015). They leverage their extensive network to connect ventures with potential partners, suppliers, and legal experts, which can be pivotal for early-stage startups. The association with a well-known VC often enhances the venture's credibility, attracting attention and trust from potential customers and investors, thereby accelerating its growth trajectory (Bocken, 2015).

#### 2.5.8 Exit Stage

The Exit Stage signifies the point at which investors seek to realise returns on their investment. This stage is critical for both BAs and VCs as it determines the financial outcome of their involvement with the venture. The strategies employed at this stage and their success indicate the investor's ability to capitalise on their initial investment effectively.

For BAs, the exit stage is the culmination of their investment journey, aiming to secure returns on their initial capital. BAs and VCs share similar exit strategies, including selling the venture, transferring equity to management, selling equity to outside investors, merging with larger firms, or pursuing an Initial Public Offering (IPO). BAs, however, show a preference for exits through sales to larger companies or initiating IPOs (Tykvová, 2003). BAs enhance the venture's growth and marketability to facilitate a successful exit, preparing it for an attractive acquisition or a successful public offering (Mason et al., 2015). Despite careful planning, the exit process can encounter obstacles, leading to delays in realising the anticipated returns and presenting a significant challenge for BAs in the exit phase (Botelho et al., 2021).

In contrast, the Exit Stage for VCs is when they look to recoup and, ideally, exceed their initial investment, marking a critical moment in the VC investment process. VCs employ various strategies during this stage, including facilitating a buyout by the venture's leaders, selling the venture to

another business, launching an IPO, or liquidating its assets to settle its debts. While IPOs offer the allure of high returns, many VCs prefer selling the venture to another company as it typically ensures a quicker and more certain return compared to the often protracted and uncertain IPO process (Puri & Zarutskie, 2012). This stage shifts the focus from supporting the venture's growth to converting the VC's equity into liquid assets, highlighting the strategic importance of exit planning within the VC investment framework (Ueda, 2004).

## 2.6 BA and VC Investment Decision-making in Sweden and the Nordic Region

Sweden and its Nordic neighbours of Denmark, Finland, Norway, and Iceland possess distinct characteristics when investing in startups, particularly in the life science sector. Historically, BAs and VCs preferred early-stage investments, making the Nordic region stand out globally. In recent years, VCs have displayed heightened activity in the life sciences domain (Zeilon & Lindén, 2022).

This uniqueness can be attributed to robust educational institutions, government incentives for R&D, and a culture that fosters innovation. The Nordic countries have a rich history of medical research and a solid foundation in biotech, which serves as a magnet for investors (Bengtson et al., 2022). The distinct investment pattern in Sweden raises several pertinent questions about the decision-making mechanisms of BAs and VCs. How do these entities assess the potential of startups? What kind of due diligence is undertaken, and how do they mitigate risks?

Further, cultural elements also play a pivotal role. A high level of trust characterises the Nordic region, openness to collaboration, and acceptance of failure as a stepping stone to success, which might influence investment decisions (Langaas & Mujtaba, 2023). While globally, the term Venture Capitalist often implies investment in slightly matured startups, the Nordic narrative paints a different picture. In this region, particularly Sweden, a VC is more akin to what many might consider an early-stage investor. This deviation is not just semantic; it underscores the region's tendency to back ventures from their conceptual phase (Berglund, 2011). This difference in definitions can be traced back to the robust entrepreneurial ecosystem in Sweden, where startups have access to many government-funded resources early on. Such an environment gives VCs confidence in early-stage investments (Kulkov et al., 2020).

Though BAs and VCs in Sweden gravitate towards early investments, their motivations and strategies might differ. Research indicates variations in their approaches, possibly rooted in their size, network access, or desired returns on investment (Silver et al., 2016). For instance, BAs might prioritise personal rapport with founders and direct involvement in the startup. However, VCs might lean

heavily on market trends, scalability, and potential for high returns, given the more significant sums of money involved (Bruton et al., 2009).

## 2.7 Theoretical Lenses: Deciphering Decision-making

### 2.7.1 Introduction to Signalling, Institutional, and Agency Theories

Three established academic theories, signalling theory, institutional theory, and agency theory, are explored in this study to gain comprehensive insight into the complex decision-making processes of investors in the life sciences sector. The selection of these theories is grounded in their proven applicability to the dynamics of investment decisions and their ability to collectively provide a multifaceted understanding of the interactions between investors and startups, particularly in the context of VC and BA investments.

Signalling theory primarily focuses on the communication between entrepreneurs and investors. It addresses how startups, as 'Signallers', convey information about their quality and potential to investors, or 'Receivers'. This theory is especially relevant when information asymmetry exists, helping to understand how investors interpret and react to startup signals.

Institutional theory examines the broader context in which both startups and investors operate. It considers how external factors like social norms, regulations, and cultural values shape organisations' behaviours and strategic decisions. This theory is crucial in understanding how systemic factors influence investment decisions, particularly in highly regulated sectors like life sciences.

Agency theory delves into the relationships between principals (investors) and agents (entrepreneurs), focusing on issues arising from conflicts of interest and information asymmetry. Central to this theory is understanding how investors manage risks and ensure alignment of interests with their investee companies.

While each of these theories provides valuable insights into investor behaviour, their applicability varies based on the specificities of the Swedish and broader Nordic investment environment. By exploring these theories, the study aims to select the most fitting framework to effectively analyse and understand BAs and VCs' decision-making criteria in Sweden's life sciences sector.

### 2.7.2 Agency Theory and Decision-making for BAs and VCs

Agency theory provides an invaluable framework for understanding the intricacies of relationships between life science startups and their potential investors, specifically BAs and VCs (Eisenhardt,



1989; Meckling & Jensen, 1976). The domain of life sciences, marked by its intrinsic complexities in research, protracted development phases, and substantial investment requirements, necessitates a nuanced examination of the decision-making processes adopted by BAs and VCs.

A central tenet of agency theory is the potential for conflicts arising from information asymmetry, such as adverse selection and moral hazard. When applying these concepts to investment, they significantly influence the criteria BAs and VCs employ when assessing life science ventures.

During the initial stages of investment consideration, BAs and VCs confront the challenge of adverse selection. It pertains to the difficulty of distinguishing up-and-coming startups from a larger pool, especially in scenarios where comprehensive information may not be readily accessible (Osnabrugge, 2000). Both BAs and VCs have been observed to adopt meticulous screening methodologies. Preference often gravitates towards startups that exhibit evidence of robust research foundations, secured intellectual property rights, or have achieved commendable progress in clinical trials.

After solidifying their investments, the concern for BAs and VCs shifts towards moral hazard. This revolves around ensuring that the operational and strategic decisions undertaken by the startups align consistently with the investment objectives. Given the extensive development timelines characteristic of life science projects, startups have a pronounced potential to deviate from their initial commitments. It has been noted that to mitigate such risks, BAs and VCs may impose certain pre-agreed conditions or milestones. Some even go to the extent of seeking board representation, viewing it as a mechanism to closely monitor and influence the strategic trajectory of the startup (Wiltbank, 2005).

Practically, the strategies employed by BAs and VCs, although grounded in similar foundational principles, exhibit distinct nuances. With their structured investment portfolios and considerable financial reputation, VCs often spread their investments across diverse stages of life science startups. Their involvement tends to be more hands-on and directive, stemming from the sizable financial stakes they commit (Arthurs & Busenitz, 2003). In contrast, although they diversify their investments, BAs adopt a more personalised, relationship-centric approach. Their investment decisions often factor in the added value they can bring, whether in the form of industry contacts or specific domain expertise (Kelly & Hay, 2003).

Given the unique challenges posed by the life science sector, it is evident that both BAs and VCs place paramount importance on rigorous due diligence. Collaborations with industry stalwarts and experts are often sought to bolster the robustness of their investment decisions.

### 2.7.3 Signalling Theory and its Application in VC and BA Investment Decisions

Emerging prominently in recent discourse on investment evaluations, signalling theory provides a comprehensive framework to examine the interaction dynamics between entrepreneurs and investors in the life science sector (Connelly et al., 2011; Spence, 1973, 2002). Central to signalling theory is the concept of addressing the inherent information asymmetry between the two parties: the startup (Signaller) and the investor (Receiver) (Bernstein et al., 2017; Payne et al., 2009). Within this context, the Signaller, the more informed party about the enterprise's details, can strategically impart positive and potentially unintentional negative signals. These signals project insights into the startup's feasibility, strengths, and prospective value (Kollmann & Kuckertz, 2010; Plummer et al., 2016).

When contextualised within startups, it becomes imperative for the informed startup to impart credible signals, thereby guiding the less-informed investor during the crucial pre-investment phase. Startups aid in diminishing the investors' uncertainties by effectively conveying their inherent quality and value, which increases the likelihood of investment acceptance (Connelly et al., 2011; Spence, 2002). This active signalling minimises adverse selection and moral hazard risks, ensuring a more transparent decision-making process. Within signalling theory, "qualities" pertain to the specific attributes of investors deemed crucial by startups, including managerial acumen and market reputation. Furthermore, it is crucial to acknowledge that signalling is not a one-way street. Investors such as BAs and VCs also signal their value to startups. This reciprocal signalling process involves investors showcasing their value-add beyond capital, such as their expertise, network, and reputation, to attract high-quality startups.

However, the efficacy of signals is contingent upon two fundamental criteria: observability and the associated cost of imitation (Brush et al., 2012; Mitteness et al., 2012). A signal's value is accentuated when it is discernible and comprehensible by the receiver, enabling a clear distinction between high-calibre and suboptimal investors. For instance, a VC or BA might accentuate their human capital prowess, spotlighting their affiliation with esteemed managers endowed with rich industry experience (Brush et al., 2012). However, more than just observability is required. The cost of replicating a signal further determines its credibility (Spence, 1973). A signal that demands significant resources (time, effort, or finances) for imitation is viewed as more genuine and less prone to duplicity (Clough et al., 2019). For instance, an investor showcasing a robust investment history and demonstrable success is a potent and expensive signal. Given the substantial commitment of resources, Replicating such a record distinguishes premium investors from their lesser counterparts.

#### 2.7.4 Institutional Theory in the Context of VC and BA Decision-Making

The third relevant theoretical framework for this research, institutional theory, presents a compelling lens through which the decision-making criteria of BAs and VCs in life science startups can be deciphered. Institutional theory posits that the decisions and behaviours of organisations are significantly influenced by institutional pressures and the norms, values, and beliefs that prevail in their environment (Meyer & Rowan, 1977; Powell & DiMaggio, 2012; Zucker, 1987). These pressures often shape organisations' strategic choices and practices, including BAs and VCs, particularly in life sciences marked by rapid evolution, regulatory oversight, and intricate stakeholder relationships (Jacob et al., 2003).

Startups, with their unique set of challenges, often navigate a landscape punctuated by stringent regulatory frameworks, technological advancements, and shifting stakeholder expectations (Wisuttisak, 2021). As such, institutional pressures become paramount in influencing the decision-making paradigms of entrepreneurs and investors alike (Powell & DiMaggio, 2012). For BAs and VCs, the external legitimisation derived from adherence to institutional norms can offer a competitive edge, enhancing their attractiveness to potential life science startups (Conti et al., 2010).

Institutional theory highlights the symbiotic relationship between entrepreneurs and their investors (BAs and VCs) in the post-investment landscape. Investors, operating within the bounds of institutional expectations, frequently bolster the life science venture's legitimacy and credibility by introducing them to established networks, aiding in navigating regulatory waters, or lending their institutional reputation (Zhao et al., 2016). Earlier sections of this review have delved into the myriad value-adding propositions offered by investors; from an institutional theory perspective, these can be construed as mechanisms to align the startup with prevalent institutional norms and, thereby, amplify its chances of success and sustainability (Powell & DiMaggio, 2012; Zucker, 1987).

Hence, when investors evaluate potential investments, they are not just assessing monetary contributions. Through the lens of institutional theory, these evaluations become exercises in discerning how well the investor can help the venture align with, or even leverage, the prevailing institutional landscape. This includes a deep dive into the investor's ability to offer tangible and intangible assets, like robust networks, reputation, and a keen understanding of the sector's institutional dynamics, especially when the venture finds itself at a crossroads or navigating uncertainties (Zacharakis et al., 2007).

## 2.8 Theoretical Concepts in the Swedish Context

### 2.8.1 Agency Theory

Sweden's unique socio-economic landscape heavily influences the application and interpretation of agency theory, particularly in the realm of VC and BA investments in life sciences.

First and foremost, Sweden's reputation as a pioneering nation in innovation, particularly in life sciences, has deep historical roots. The country's rich research tradition and emphasis on fostering innovation has given rise to a robust ecosystem of startups, especially in the life sciences sector (Bergqvist, 2008). This, in turn, presents both opportunities and challenges for BAs and VCs in terms of agency relationships.

The cultural values of transparency, trust, and collaboration deeply embedded in Swedish society play a critical role in defining agency relationships. In many Western economies, agency problems often arise from mistrust or asymmetric information. However, in the Swedish context, the high levels of trust tend to minimise classical agency dilemmas. Consequently, principal-agent relationships in the Swedish VC and BA are often characterised by collaborative partnerships rather than strictly contractual interactions (Landstrom, 1993).

Moreover, Sweden's comprehensive regulatory framework provides clear guidelines for business operations, particularly in sectors like life sciences. While ensuring that startups adhere to the highest standards, these regulations also influence the dynamics between investors and entrepreneurs. Given the strict oversight, BAs and VCs in Sweden often prioritise startups that show promise in terms of returns and demonstrate a solid commitment to regulatory compliance and ethical considerations. This is especially true in the life sciences sector, given the implications of innovations in this field on public health and safety (Gregersen & Pålsson, 2011).

Furthermore, the Swedish tradition of collaborative business models, exemplified by its 'triple helix' model of university-industry-government cooperation, influences the dynamics of agency relationships. BAs and VCs, accustomed to this collaborative environment, often engage in more hands-on roles with their investee startups. This direct involvement further reduces information asymmetry and fosters a more harmonious principal-agent relationship (Etzkowitz & Leydesdorff, 2000).

### 2.8.2 Signalling Theory

In understanding the application of signalling theory in the context of VC and BA decision-making for Swedish life science startups, one must first consider the nuanced socio-economic and cultural dynamics that Sweden offers.

The strong trust ethos in the Swedish entrepreneurial ecosystem, deeply rooted in the nation's cultural fabric, tends to influence how signalling mechanisms function. In many global contexts, the emphasis on signalling often arises from mistrust or potential deceit. However, Sweden's collaborative and transparent business environment tends to reduce the intensity of these traditional signalling concerns (Mohammadi et al., 2014).

In addition, the nature of Sweden's innovation-driven economy, characterised by a strong emphasis on R&D, especially in the life sciences sector, necessitates robust signalling from startups. Swedish life science startups often emerge from cutting-edge research institutions and boast rigorous scientific foundations. Consequently, the signals they send are about potential profitability and their ventures' scientific validity and innovation quotient. For BAs and VCs, deciphering these signals becomes crucial in determining not just the economic viability but also the pioneering potential of the venture (Farhana & Swietlicki, 2020).

Furthermore, the Swedish government's supportive stance on innovation, manifested in various policies and initiatives, has indirectly strengthened the signalling environment. With government bodies and institutions often backing or collaborating with startups, any association or endorsement from such entities becomes a powerful signal for BAs and VCs, especially in sectors as crucial and sensitive as life sciences (Jacob et al., 2003).

The vibrant and interconnected nature of the Swedish startup ecosystem also plays a role. In a tightly knit environment where many players are familiar with one another, reputational signals become incredibly impactful. A life science startup that has previously collaborated with renowned institutions or received approving nods from influential industry figures sends potent signals about its credibility and potential (Nauwelaers et al., 2013).

### 2.8.3 Institutional Theory

Sweden's unique positioning as a Nordic country offers a distinctive backdrop against which institutional theory unfolds, influencing VC and BA decision-making for life science startups in nuanced ways. The Nordic model, characterised by its egalitarian values, strong welfare state,

cooperative labour relations, and high trust in public institutions, has been widely acknowledged in the literature (Isaksson et al., 2004; Zacharakis et al., 2007).

Sweden's life science sector is a testament to the country's strong emphasis on research and innovation. With a robust healthcare system and a longstanding tradition of public and private sector collaboration, the sector enjoys the patronage of a proactive policy environment and public investments (Arachchi & Nimesha, 2022; Mohammadi et al., 2014). However, such an intertwined ecosystem also ushers a strong institutional influence over decision-making processes.

Adherence to national and sector-specific norms, rules, and regulations is paramount for BAs and VCs operating in Sweden. Institutional pressures in Sweden are not just regulatory but are also profoundly cultural, stemming from a societal emphasis on sustainability, innovation, and ethical considerations (Isaksson et al., 2004; Styhre, 2017). These cultural pressures play a pivotal role in shaping investor decisions, where evaluations often go beyond mere financial profitability, encompassing broader societal impacts and contributions to the Swedish innovation ecosystem.

Life science startups in Sweden, while benefiting from a supportive institutional environment, also face the challenges of navigating the intricacies of this system. BAs and VCs, thus, bring more to the table than just capital – they offer startups the much-needed institutional knowledge, helping them traverse the Swedish regulatory landscape, forge strategic alliances, and tap into national and regional innovation networks (Chatterji, 2009; Ejerme & Kander, 2011).

Consequently, from the perspective of institutional theory, the entrepreneur's evaluation of BAs and VCs in the Swedish context encompasses an assessment of the investor's proficiency in leveraging the Nordic institutional fabric. It becomes imperative for investors to demonstrate not just their financial acumen but also their adeptness in navigating and capitalising on Sweden's unique institutional dynamics (Isaksson et al., 2004).

## 2.9 Theory Limitations

### 2.9.1 Agency Theory Limitations

Despite the compelling alignment of agency theory with the Swedish innovation landscape, it is prudent to acknowledge some limitations associated with its application. Agency theory predominantly focuses on the asymmetries and conflicts that may arise between principals and agents due to divergent interests. In a culture like Sweden's, where trust and collaboration underpin business relationships, the intensity of traditional agency problems may be less pronounced than in

other contexts. Applying agency theory without fully considering Sweden's culture of trust and collaboration might lead to an oversimplification, failing to capture the complex, trust-based interactions and mutual dependencies that characterise business relationships in this context, thereby potentially misrepresenting the subtleties and richness of the Swedish innovation ecosystem (Isaksson et al., 2004).

Additionally, agency theory, in its essence, often emphasises safeguarding the interests of the principal (the investor in this context) against potential opportunistic behaviours of the agent (the entrepreneur or startup). However, in Sweden's cooperative ecosystem, there could be instances where such delineation is blurred, with both parties working towards shared goals rather than individualistic pursuits (Landstrom, 1993).

### 2.9.2 Signalling Theory Limitations

While signalling theory provides valuable insights into understanding VC and BA decisions in the Swedish life science sector, it has limitations, especially given the distinct Swedish backdrop. First, in an environment that already emphasises high levels of trust and collaboration, the classic problems signalling aims to solve, such as information asymmetry arising from distrust, may be less pronounced. Thus, while signalling remains relevant, its traditional application may be diluted in this context (Lundberg, 2006).

Secondly, with the prevalence of strong signals such as endorsements from reputed institutions or nods from industry leaders, there is a potential risk of over-reliance on a limited set of strong signals, which might overshadow other equally valuable but subtle indicators (Berglund & Sandström, 2013). Additionally, given the emphasis on collaborative business frameworks, the line between genuine signals and those influenced by existing relationships or collaborations might blur, potentially leading to biased investment decisions.

Lastly, while signalling theory offers a way to understand how startups communicate their value, it might only partially encapsulate the depth and breadth of investor-startup dynamics in the Swedish life science domain. Factors like strategic alignment, shared vision, risk paradigms, and the hands-on role of investors in the startups' journey, all integral to the Swedish entrepreneurial ethos, might be better examined through other theoretical lenses, like the agency theory, which offers a more holistic view of these multifaceted relationships (Johannesson et al., 2017).

### 2.9.3 Institutional Theory Limitations

Despite the depth of insight provided by institutional theory, some considerations warrant its critical evaluation as the primary lens for this research. One of the most prominent challenges is that the theory primarily focuses on external pressures and the macro environment. While it provides a macroscopic understanding of the broader forces influencing decision-making, it might overlook the micro-dynamics that exist within the individual relationships between VCs, BAs, and startups. The Swedish entrepreneurial environment, characterised by its unique blend of trust, collaboration, and innovation, presents intricate motivations, risks, and relationships that might extend beyond what the institutional perspective captures in isolation (Berglund & Wijesuriya, 2014).

Moreover, institutional theory, by its very nature, can sometimes paint an overly deterministic picture. Emphasising conformity to societal norms and institutional pressures may inadvertently downplay the agency, strategic choices, and innovative drives of individual investors and entrepreneurs. In the dynamic world of VC and BA investment, especially in a sector as innovative as life sciences, it is critical to understand not just how entities conform to existing norms but also how they strategically manoeuvre, innovate, and sometimes challenge or redefine these norms (Estrin et al., 2013).

Lastly, while the theory emphasises the role of cultural, normative, and regulatory influences on decision-making, it might not delve deeply into the intrinsic motivations, conflict dynamics, risk perceptions, and trust paradigms that underpin the VC-entrepreneur relationship in Sweden's life sciences sector. Such intricacies might be better unravelled through a theory like agency theory, which inherently focuses on the principal-agent dynamics and the associated challenges and opportunities (Holm, 2016).

### 2.10 Agency Theory: Fitting Framework for this Research

Considering the discussed theory limitations, agency theory remains a pertinent framework for exploring the Swedish VC and BA decision-making processes in the life sciences. While the traditional problems posited by the theory may be mitigated by Sweden's unique socio-cultural attributes, the foundational principles of agency theory – dealing with information asymmetry, aligning interests, and navigating contractual nuances – are universal and highly relevant.

The nuanced Swedish context provides an exciting opportunity to adapt and expand upon classic agency theory constructs. Understanding how the typical principal-agent dynamics transform in a trust-rich environment like Sweden can offer fresh perspectives and enrich the global discourse on agency relationships in venture capital dynamics.



Given the inherent intricacies of the life science sector, where the stakes are high and the complexities manifold, agency theory's focus on aligning interests, ensuring appropriate oversight and optimising performance incentives offers a robust lens to study the investor-startup relationship in the Swedish landscape. In essence, while acknowledging its limitations, the use of agency theory as the primary theoretical framework remains justified and well-suited for the aims of this research.

### 2.11 Comparison and Rationale for Theoretical Choice

Agency theory's central theme revolves around the principal-agent relationship, exploring the potential tensions and complexities arising from differing objectives, informational disparities, and associated risks. This perspective provides a rich framework for understanding the nuanced interactions between entrepreneurs (principals) and their investor counterparts (agents), shedding light on possible moral hazards, challenges of adverse selection, and inherent conflicts within such associations.

While signalling theory is insightful, its primary domain concerns bridging information gaps via strategic signalling, emphasising how startups project their inherent value to potential investors. However, it might not encompass the broader relational dynamics and diverse challenges embedded within the investment decisions of BAs and VCs.

Conversely, institutional theory presents a broader perspective of organisational conduct against societal expectations, norms, and pressures. However, it tends to pivot more on external influencers. Even though it provides an overarching view of the startup-investor space, it might be unable to zero in on the intimate investor-startup interplay and its related intricacies.

Agency theory's relevance in this research becomes evident when considering its comprehensive approach to principal-agent relationships. It enables detailed scrutiny spanning micro-level (individual decisions of BAs and VCs) and macro-level (industry-wide tendencies and shifts) considerations. With the life sciences arena in Sweden being a complex matrix of regulatory challenges, risks, and unpredictability, agency theory's focus on risk management, moral dilemmas, and potential discord proves indispensable. Its alignment with the central research aims—to delve into the assessment criteria, methodologies, and primary concerns crucial for BAs and VCs—further solidifies its selection.

Despite the high trust levels and collaboration, potential challenges might arise, such as navigating the balance between collaboration and control or understanding evolving agency dynamics in a rapidly changing innovation landscape. However, these anticipated challenges only underline the

significance of employing agency theory, as they offer rich avenues for exploration, aligning seamlessly with the study's objectives.

While each theory offers unique perspectives and bears academic significance, agency theory distinctly resonates with this study's objectives. It furnishes a coherent, methodical, and focused avenue to decipher the investment intricacies within Sweden's life science startup landscape.

## 2.12 Summary

This literature review offers an enriched context, setting the stage for the upcoming investigations of this study. As the global innovation landscape continually evolves, the life science sector in Sweden stands at an intersection between opportunities and challenges. In such a scenario, BAs and VCs hold significant influence, serving as gatekeepers who provide resources to emerging startups that showcase potential. However, a deeper understanding of the key decision-making criteria employed by these key stakeholders within the Swedish life science sector is still needed.

Several scholars have, in different capacities, touched upon investment dynamics. However, the focus on the specifics of BAs and VCs in the life science space, especially in the Swedish context, could be more extensive. Three theoretical frameworks were examined: signalling, institutional, and agency theory. Each proffers valuable insights, but when weighed against the specific nuances of this research, one stands out as the most fitting.

Agency theory, which revolves around the relationship between investors (agents) and entrepreneurs (principals), is best positioned to address this study's core concerns. It offers a clear lens to explore the intricacies of trust, information balance, risk assessment, and decision-making in the Swedish context. While Signalling and Institutional theories give broader perspectives on the startup ecosystem, agency theory's focused approach to the investor-entrepreneur relationship marks its significance for this study.

With the central aims outlined, this research study seeks to dive deep into the thought processes of BAs and VCs in Sweden's life science sector. The aim of the study is to explore key decision-making criteria these stakeholders use when considering potential startups for investment and to investigate the challenges, nuances, and barriers they contend with within the multifaceted Swedish innovation ecosystem.

Situated within Sweden's rapidly growing life science sector, the ensuing research aspires to contribute a granular, contextualised, and empirically grounded understanding of the existing

literature. The insights gained from this literature review will guide the exploration to answer the central research questions and fulfil the study's aims.

## Chapter 3: Methodology

This chapter outlines the methodology adopted in this thesis, explaining the rationale for specific decisions made throughout the research process. The study is an exploratory effort to uncover the key decision-making criteria used by BAs and VCs when evaluating potential investments in Sweden's life science sector. A qualitative research strategy was employed to understand the investment dynamics within this distinct innovation ecosystem.

### 3.1 Qualitative Research Strategy

The choice of a qualitative research strategy for this study stems from its ability to yield rich and detailed insights into the decision-making processes of BAs and VCs within Sweden's life science sector. Unlike quantitative methods, qualitative strategies thrive in exploratory scenarios, making it a fitting approach for this investigation (Bryman et al., 2008).

The preceding literature review chapter highlighted a gap in understanding the key criteria employed by BAs and VCs in Sweden when assessing potential investments in this sector. This study, therefore, leverages a qualitative design to navigate through the less explored terrains of investment dynamics in Sweden's life science sector without imposing undue restrictions or assumptions on the data collected.

Historically, research on investment criteria has often gravitated towards quantitative methodologies, as seen in various studies (Forbes, 2005; Valliere & Peterson, 2007). However, this study diverges from the norm by embracing a qualitative approach, aiming to enrich the theoretical discourse surrounding the investment dynamics in Sweden's life science sector.

One of the compelling advantages of a qualitative approach is its less stringent reliance on sample size to derive meaningful conclusions (Boddy, 2016; Sandelowski, 1995). Given the specialised and potentially limited pool of BAs and VCs within the Swedish life science sector, this feature of qualitative research becomes particularly beneficial.

Moreover, the qualitative approach chosen for this study is crucial in understanding the investors' timely significance and broad viewpoints. This approach is critical for a thorough exploration of the investment environment in this sector.

The qualitative research strategy is apt for exploring the decision-making criteria of BAs and VCs and contributing a fresh perspective to the existing body of literature, thereby advancing the understanding of investment dynamics in Sweden's life science sector.

### 3.2 Semi-structured interviews

The primary method for collecting core data in this study was semi-structured interviews. This technique is valued in qualitative research circles for its ability to generate detailed and insightful data, aligning well to understand the criteria of BAs and VCs (Galletta, 2013). Semi-structured interviews provide the researcher with a degree of flexibility in guiding the interview's focus and direction; the researcher has the liberty to adjust or add new questions based on the responses from the interviewee. This adaptable nature ensured the discussions were directed towards the study's goals while allowing participants to provide thorough and well-articulated responses.

Moreover, semi-structured interviews enable the researcher to venture into new or unforeseen ideas and responses, engage in deeper probing when more elaboration is required, rectify inconsistencies in responses, and tackle specific questions and issues that arise. This methodology leads to a rich and thorough data collection, revealing subtle differences that might have been overlooked.

Structured interviews were set aside for this study due to their rigid question framework, unlike the more adaptable semi-structured interviews, which function on a changeable schedule. As a result, typical data collection instruments associated with structured interviews, like questionnaires and surveys, were considered inappropriate owing to their inability to delve deeply and the risk of missing out on pertinent and vital information. This shortfall often stems from a lack of prompts that elicit more comprehensive responses. Moreover, unstructured interviews were dismissed due to the potential of drifting into discussions that might stray from the core topics of this study.

In this research, a semi-structured interview guide was used, featuring a variety of open-ended questions designed to explore the key criteria that BAs and VCs use when assessing potential startups for investment. Open-ended questions are favourable for drawing out detailed and descriptive responses, fostering a reflective engagement from participants. The crafted questions were expansive yet adaptable, with prompts to steer the conversation and glean additional information based on the participants' responses. Before conducting the interviews, the interview guide was reviewed first by the researcher's academic supervisor. Subsequently, it was refined based on feedback from a mock interview conducted with an investor, ensuring its effectiveness in achieving the research objectives.

The interview schedule was organised around five principal themes: 1) Investor's Background and Experience, 2) Investment Evaluation, 3) Networking and Collaborative Influence, 4) Challenges, Barriers, and Geographical Implications, and 5) Future Outlook and Advice. This arrangement provided a structured pathway for the discussion, ensuring a comprehensive exploration of the investment dynamics within Sweden's life science sector. The interview schedule used in the semi-structured interviews can be referred to in Appendix 1.

In the initial section, the focus was on understanding the background and experience of the investors. This segment aimed to delve into the investors' journey within VC or BA investing in the life science sector and the experiences or training that have honed their investment decisions over time.

In the second section, the emphasis shifted to the criteria and processes investors employ when evaluating potential life science startups for investment. This segment was vital as it aimed to uncover the key factors considered by investors, the importance of the management team, and the financial indicators that significantly influence their decision-making process.

The third section explored the role of networks and collaborations in the investment decision-making process. It aimed to understand how local or international networks influence the investors' decisions and how engagements with international or cross-border investors or startups are navigated.

In the fourth section, the discussion delved into the challenges and barriers investors face, along with the geographical implications affecting their investment decisions. This segment aimed to uncover the main challenges within the Swedish innovation ecosystem, the regulatory or market challenges in the Swedish life science sector, and how the geographical location of a startup, either within Sweden or internationally, affects investment decisions.

The concluding section, themed around future perspectives and sector-specific insights, is aimed to gauge how the rapidly evolving nature of the life science sector might influence investment criteria in the coming years. Additionally, it sought to collect advice or insights that investors would offer to life science startups in Sweden looking to attract VC or BA investments.

Through this thematic and structured approach, the interview schedule was designed to cover a comprehensive range of topics, providing a detailed understanding of the investment dynamics within Sweden's life science sector.

### 3.3 Approach

The participants for this study were gathered through a blend of non-random purposive and snowball sampling methods. The use of purposive sampling was instrumental as it facilitated the selection of participants who accurately aligned with the study's inclusion and exclusion benchmarks. This criterion stated that participants should either be VAs or BAs with active involvement in the life sciences sector, be part of the Swedish life science ecosystem, have participated in at least one investment in life science startups, and have at least three years of experience as an investor. For this study, a Venture Capitalist was defined as an individual or entity that managed pooled funds from many investors to invest in startups and small businesses, and BAs were defined as high-net-worth individuals who provided capital to startups and small businesses for a stake in equity or convertible debt. Purposive sampling is advantageous as it deepens the understanding of selected individuals or groups, enriching the theoretical and conceptual development by offering profound insights into specific experiences or processes (Campbell et al., 2020; Etikan, 2016; Gentles et al., 2015). Contrary to random sampling, purposive sampling is valuable in illustrating a social phenomenon of interest (the investment decision-making criteria of BAs and VCs), especially when the sample size is modest and known to exhibit variation based on several factors.

On the other hand, snowball sampling enabled the researcher to extend the recruitment of potential participants relevant to the investigation by utilising the contacts of participants already engaged in the study. The recruitment of additional participants persisted until a suitable sample size was reached. The sample number was deemed adequate when data saturation was reached. Data saturation is when collecting more data from new interviews becomes repetitive as no new ideas or themes are generated, and the information is primarily reiterated (Fusch & Ness, 2015).

In this investigation, the sample was sourced from the life science ecosystem within Sweden and separated into BAs and VCs. The study engaged a total of 9 individuals, with 6 being VCs and 3 being BAs, all actively participating in Sweden's life sciences sector. The interviewees showcased a spectrum of experience and involvement within the sector, extending from those engaged in initial-stage investments to those partaking in advanced-stage funding rounds.

### 3.4 Sample Size

The sample size in this study is enough to capture the variety of viewpoints and provide depth in the data collected to fully explore the topic, as qualitative methods are less dependent on sample size to achieve impactful results (Boddy, 2016; Sandelowski, 1995). Limiting factors can make it hard to get a

larger sample size. These factors included the short six-month period of the study, difficulties in reaching the BAs and VCs, their willingness to participate, and scheduling conflicts. However, as mentioned before, qualitative studies can provide deep, meaningful insights even with a small sample size.

### 3.5 Data Analysis

After transcription, the qualitative data was analysed using NVivo 14 (Lumivero, 2023). This sophisticated software facilitated detailed examination and visual representation of the data. The primary technique applied for this analysis was thematic analysis, a method Braun & Clarke (2006) described as highly effective for qualitative research. Thematic analysis excels in its capacity to identify, dissect systematically, and report patterns or themes within data, making it particularly relevant for this study. It adeptly captures participants' varied experiences, interpretations, and perspectives, drawing out both the unique and shared aspects of their narratives (Braun & Clarke, 2006).

In applying thematic analysis to this study, the focus was on extracting and interpreting core themes and ideas relating to the decision-making criteria of BAs and VCs when investing in life science startups. The coding and theme development approach was two-fold, encompassing both inductive and deductive methods. Inductive themes emerged organically from the researcher's detailed data analysis, reflecting a bottom-up approach. In contrast, deductive themes were informed by existing theoretical frameworks and research literature, aligning with a top-down approach. This dual methodology ensured a comprehensive analysis, encapsulating various perspectives and enhancing the depth of understanding of the investment selection and evaluation processes.

The coding process required multiple readings of each transcript to ensure that the extracted codes genuinely captured the essence of the participants' discussions. Identifying commonalities and divergences across transcripts laid the groundwork for systematic code and theme development. These codes were then organised into meaningful categories, formulating distinct themes. The resulting themes provided a rich, multi-layered insight into the perceptions and considerations surrounding the decision-making criteria of BAs and VCs.

### 3.6 Ethical Considerations

In line with ethical standards, this study received approval from the University of Auckland Human Participants Ethics Committee (UAHPEC) on the 24th of March 2022 for three years, under Reference

Number 022768. Recognising the sensitive nature of the information shared by investors and critical decision-makers in life science companies, stringent confidentiality measures were implemented.

As part of the ethical protocol, each participant received a detailed Participant Information Sheet and a consent form before the interviews. These documents comprehensively outlined the study's objectives, ethical considerations, and the principles underpinning the participant's informed consent. They included information on confidentiality, data storage and sharing, as well as details regarding the future publication of the research.

Participants were explicitly informed that their involvement in the study was entirely voluntary, with the freedom to withdraw at any time without any need to provide a reason. Any commercially sensitive information disclosed during the interviews was either altered or excluded from the study to safeguard confidentiality. The identities of the companies and investors involved were protected by assigning unique codes (e.g., VC1) that were only decipherable by the researcher. This approach significantly minimised the risk of participant identification.

Additionally, to maintain the confidentiality of the participants, all interviews were transcribed solely by the researcher, without involving any third parties. All data, including audio recordings and transcripts, were securely stored electronically on a password-protected computer belonging to the researcher. In line with ethical commitments, audio recordings and transcripts were permanently deleted after the study's conclusion.

These ethical protocols were pivotal in protecting participant privacy and data security throughout the research process, thereby upholding the integrity and credibility of the study.

### 3.7 Validity and Reliability in Research

In this study, reliability is conceptualised not just as the ability to replicate results under similar conditions but, more crucially, as the dependability and trustworthiness of the research process (Golafshani, 2003). The data collection and analysis methods have been meticulously outlined to enhance the study's reliability. Despite the inherent challenges of replicating semi-structured interviews due to their conversational nature, a standardised interview schedule was employed to ensure consistency across discussions.

Validity in this study pertains to two key aspects: internal and external validity. The purposive sampling technique bolstered the research findings' internal validity and accuracy. This approach ensured that participants were chosen based on their knowledge and expertise relevant to the research questions (Golafshani, 2003). Such a focused selection process increases the likelihood that



the findings accurately reflect the studied phenomenon. Respondent validation was implemented to enhance internal validity further. Participants were given copies of their interview transcripts and a summary of the findings, allowing them to verify and clarify the data.

External validity acknowledges the study's limited scope in being able to make widespread generalisations about the early-stage investment industry. However, the rich insights from the purposive sample provide a foundation for understanding key decision-making criteria, potentially informing future research (Golafshani, 2003). The study's validity was also increased through triangulation, comparing primary data findings with secondary data to allow for a comprehensive analysis (Carter et al., 2014).

Pre-testing the interview schedule with the academic supervisor and an industry investor, followed by respondent validation, ensured the final interview framework was robust and comprehensive. Additionally, constant comparisons between participant transcripts during the coding process were vital in capturing differences between participant responses and maintaining accuracy and consistency.

Ethical considerations were paramount throughout the study to ensure participant comfort, especially given the potential disclosure of commercially sensitive information. Maintaining a conversational tone during interviews and building rapport fostered an environment conducive to open and honest dialogue. Lastly, the researcher's awareness of their own preconceived notions and values was critical in preventing bias in data collection and analysis (Braun & Clarke, 2006).

This approach to reliability and validity underpins the study's credibility, reinforcing its findings' trustworthiness and applicability (Golafshani, 2003).

## Chapter 4: Findings

This chapter will address the findings from the research as per the research question presented in Chapter 1. A summary of the study participants will be presented first, followed by an outline of the decision-making criteria used by BAs and VCs. Chapter 5 will discuss the study's findings and how they relate to each other, the research question, and the published literature.

### 4.1 Participants

This section outlines the profiles of the investors who participated in this study, drawing upon the methodology described in the preceding chapter, which detailed the inclusion and exclusion criteria and the sampling procedures for participants. For this analysis, Table 2 summarises the

characteristics of the participant investors, their investment focus within the life science sector, and the stage of ventures they typically invest.

**Table 2: Investor Participants**

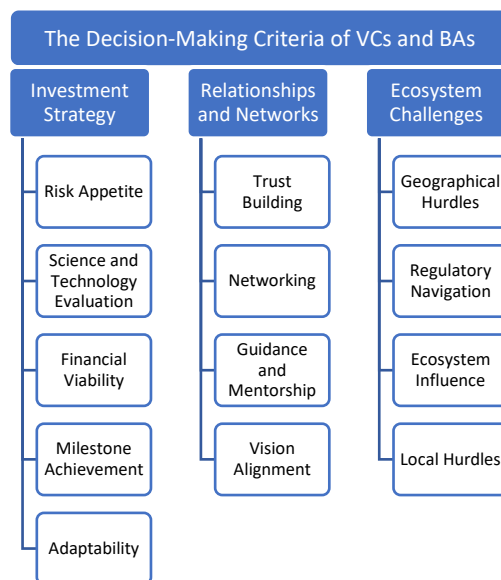
Investor	Sector of Life science Investment(s)	Stage of Life science Investment(s)	Participant Descriptions
VC1	Pharmaceuticals and Medical Devices	Seed & Startup	With a medical background and decades of experience in the healthcare sector, this participant has been active in venture capital with a focus on life sciences for several years.
VC2	Digital Health & Medical Devices	Startup & Early Expansion	This individual has a comprehensive background in investment management, with a recent focus on healthcare and life sciences.
VC3	Biotechnology & Pharmaceuticals	Seed & Startup	Originally from a science research background, this participant has several years of experience in life science investment, working with various VC firms.
VC4	Biotechnology & Digital Health	Seed & Startup	Starting in research and then moving to operational roles in life science startups, this participant has also founded companies before moving into investment.
VC5	Biotechnology & Healthcare Services	Startup & Early Expansion	This participant combines experience in research and the pharmaceutical industry with recent involvement in venture capital.
VC6	Biotechnology and Pharmaceuticals	Startup & Early Expansion	With a career starting in health-related roles, this individual has spent several years consulting in life sciences before transitioning to venture capital.
BA1	Pharmaceuticals and Medical Devices	Seed	An experienced investor with a history of co-founding firms, this participant has recently focused on life science startups.
BA2	Biotechnology & Pharmaceuticals	Seed & Startup	This participant has an international research background and a decade of experience in life science investments.
BA3	Biotechnology & Digital Health	Seed	With a foundation in life science research, this individual has extensive experience in both large and startup pharmaceutical companies.

The first column of Table 2 lists the investors, categorised as either VCs or BAs, based on their professional affiliations within the life science industry. The participants will be referred to as VC1-VC6 for venture capitalists and BA1-BA3 for business angels throughout the subsequent sections

when linking their insights to the findings. The second column defines the specific sub-sectors of life sciences each investor primarily focuses on, such as biotechnology, medical devices, pharmaceuticals, healthcare services, or digital health. The third column classifies the business lifecycle stages based on Table 1, where all participants were involved in early-stage investments in the life science field. The final column in Table 2 briefly outlines the experience and backgrounds of the participants. All participants have a wide range of experience investing in life science startups, and all participants had a scientific background except for VC6 and BA1 who had backgrounds in business.

#### 4.2 The Decision-Making Criteria of BAs and VCs

The semi-structured interviews with nine participants, consisting of BAs and VCs, identified three primary themes central to their decision-making criteria: Investment Strategy, Relationships and Networks, and Ecosystem Challenges. Specific sub-themes linked to these main categories were also identified, detailing the nuanced criteria guiding investment choices. Figure 2 visualises these key decision-making criteria employed by BAs and VCs. Both BAs and VCs showed consistency in adopting these criteria. Subsequent sections will delve into each criterion, supported by quotes from the interviews, to present a detailed account of the factors influencing investment decisions in the life science sector. Additional quotes further supporting the findings can be referred to in Appendix 2.



**Figure 2: The Decision-Making Criteria of VCs and BAs.**

## 4.3 Investment Strategy

### 4.3.1 Risk Appetite

Exploring core investment strategies among participants unveils a collective recognition of the high-risk nature inherent in early-stage life science ventures. This acknowledgment is well-articulated through their shared views.

*“You have to remember that, but what we invest in is really high risk programs.” — VC1*

Despite this, the attitude towards these risks is not one of deterrence but rather an integral factor considered within their investment framework. Participants express a nuanced acceptance of these risks, viewing them as a standard element of early-stage investment in the life sciences.

*“We assess ourselves, looking at patterns to decide what we believe in or don't. There's always the possibility that we might be wrong. Sometimes, we recognise a pattern as being strong, but if it's too costly or complex to fully evaluate, we might still take a risk and proceed. By doing this, we manage to minimise the risk through our own efforts, drawing on our knowledge. Many promising ideas begin with a single pattern that then expands into other areas. This process not only generates interesting concepts but also strengthens the company over time.” — BA1*

This acceptance is underpinned by a belief in the potential for significant rewards, provided the ventures succeed. Expecting high returns from successful innovations motivates participants to engage with early-stage opportunities despite the acknowledged risks.

*“Of course, with higher risk, we expect more in return. Yes. So, we don't invest in any company unless we think we can get a 5X return in five years. It's always like that. The more you risk, the more you need to get back.” — BA1*

Diversity in portfolio allocation strategies among the participants highlights different approaches to managing these risks. While some participants are cautious, with 10-30% of their investment portfolios dedicated to early-stage ventures, others demonstrate a more aggressive strategy, allocating 90-100% of their portfolios to such investments.

*“So, we've conducted research across our portfolio. And right now, we have about 300 active investments in our portfolio. And about a little between 50 and 60, is life science startups.” — VC2*

The variance in investment strategies reflects the participants' individual risk tolerances and strategic objectives. For some, the investment in early-stage life sciences is seen not just as a financial endeavour but as a commitment to advancing the field of healthcare and medicine.

*"We will never go into companies that manufacture, like, tobacco, or weapons, or things that are just destructive, right? That goes against our values. And also, and maybe even more importantly, is the sustainability aspect we want to ensure is present. But in life sciences, there is always that perspective on making the world better." — VC2*

#### 4.3.2 Science and Technology Evaluation

Evaluating science and technology is a cornerstone in the investment process, with participants placing a premium on rigorous scientific inquiry and groundbreaking technological advancements. The criteria for investment often pivot around the capability of a startup to address significant medical needs through innovative solutions.

*"There must be a definite, very strong medical need for treating a specific disease or disorder with insufficiently effective current treatments. Additionally, the market size should be large enough to justify developing a new company. Secondly, the science behind it should be excellent, demonstrated by good scientific results and publications in prestigious journals. Thirdly, the intellectual property strategy should be clear." — BA3*

The significance of innovation in science is a recurring theme, with participants seeking ventures that offer substantial advancements in medical and technological fields.

*"And if it aligns with our strategy, there are a few very important aspects we consider before moving into more in-depth due diligence. One key question is, is the science innovative enough?" — VC1*

A consistent approach among investors is the thorough vetting of a venture's scientific foundations and the practical applicability of its technology, underscoring the preference for startups emerging from environments conducive to high levels of innovation. The emphasis on maintaining a research connection within the startup team is highlighted as a critical factor, especially in the early stages of company development.

*"For us, it's very important that there is still a research connection, meaning that the founding team must include a credible researcher, who should ideally continue to work actively with the company for some time. In the very early phase, when trying to convince*

*others to buy your product or to integrate your method within their system, having a credible expert is crucial.” — VC3*

The participants are particularly cautious about ventures that do not offer a clear differentiation in the market, focusing instead on those that meet unaddressed medical needs.

*“Does this fulfil an unmet medical need? We never invest in a 'me-too' product. A 'me-too' product is one that enters a disease area where there are already four or five treatments, and this 'me-too' product does essentially the same thing, but slightly better. It might be that, instead of taking the pill twice a day, you take it once a day. But as you know, these are minor kinds of advantages or improvements. For us, that's not enough.” — VC1*

The varied backgrounds of investors, encompassing deep expertise in life sciences, finance, and patent law, facilitate a comprehensive assessment of a startup's scientific and technological merits.

*“Our fund, for instance, has people with different backgrounds and competences. We are a group of general partners in our fund, and we have a very, very deep and long-standing career in the life science area. We have financial experts and people who have patent insights and understanding. I do most of the evaluation myself, for the investments.” — BA3*

#### 4.3.3 Financial Viability

The financial scrutiny investors apply in evaluating life science startups underscores the pivotal role of financial metrics in the investment decision-making process. Participants emphasised valuation as a critical metric, reflecting on the balance between incentivising startup teams and ensuring the investment valuation is aligned with market realities.

*“Of course, the valuation of the startup is the key financial metric. Does it make sense? Does it add up to give the people who work there an incentive or not? I mean, nowadays, maybe they start selling it too cheap. At one point, they were definitely selling it too expensive.” — BA2*

The decision to invest is not taken lightly, with a comprehensive agreement on the business plan and financials being crucial for participants.

*“If we are not in agreement with the startup on the business plan, which we need to buy into, and with the people, the conditions, and the financials, we won't invest.” — BA3*

The complexity of financial analysis in the life sciences is well acknowledged, incorporating extensive evaluation of the cost, timelines, and strategic financing milestones, including potential exits or IPOs.

*"And then, the financial aspects are that, to build a company and develop a therapy, you need to understand how much money it takes, what the timelines are, what the value inflection points are, where you can raise new money in consecutive financing rounds, and you also need to plan for an exit or plan for a financing that could, for instance, be an IPO."*

— VC1

Market conditions play a significant role in the fundability of startups, as noted by participants, indicating a broader economic context impacting investment decisions.

*"But we have a very dominating factor that might hinder fundability, and that's the times, the financial times, and right now, we have a suppressed market. It's very difficult to get money for startup companies, and even though the company might be very good, it could be very difficult to find the means, the capital, to run the activity. And then the company has to downscale or live on a very meagre budget."* — BA3

Despite the inherent challenges of financial planning in life sciences, there is a clear focus on startups demonstrating a solid financial strategy, considering the intricate balance between necessary capital and strategic growth milestones.

*"There may be a financial climate that causes the company to suffer from not being able to raise enough money, where you need to do cost cutting and delay programs. This usually ends up being a less successful investment. It still may become a product, but from a return on investment point of view, it will not come out as good as it should have if the market had been easier to finance."* — VC1

The depth of financial analysis, encompassing a wide range of factors from valuation to market conditions, underscores the rigorous approach investors take in assessing startups' viability and growth potential within the life sciences sector.

*"We write a very extensive financial background report before we go to our investment committee that contains all these different aspects."* — BA3

#### 4.3.4 Milestone Achievement

Participants view milestone achievement as a fundamental criterion in evaluating life science investments. They stress the importance of clear, predefined milestones for gauging ventures' progress and success potential. Concerns about overpromising financial prospects underscore the need for realistic goal-setting in securing initial funding.

*"Overpromising when you're taking in money is hugely risky, and I think a lot of these investments that went down left and right during 2021 are going to cause a lot of animosities now, with situations similar, though not as bad as [another startup]. It's a good example where [the startup] claims that they can do [something], and then they're actually even hiding the data. That's the worst-case scenario." — VC2*

The significance of milestones spans scientific development, regulatory progress, or market entry preparation, indicating a venture's readiness for further investment or support.

*"The short-term perspective focuses on the intentions and plans for the company in the next, say, one and a half years, including what milestones will be achieved and the budget for doing that. So, in our first investment, we usually go into a round that will cover the running costs for the company for one and a half years, or one year in a bad case. But we also have to plan for the coming rounds as well, to understand the longer-term objectives." — VC3*

Participants value milestones for their role in reducing investment risk and enhancing venture credibility. Achievements in areas like clinical trials and regulatory approvals are particularly valued.

*"The project plan has to be very clear on what the specific milestones are, and there should be a potential significant increase in the valuation of the company after each milestone has been passed." — VC3*

Structured discussions between investors and venture teams about milestones focus on value creation at critical points.

*"And the most important thing is to hit the milestone right and value creation. So, we want to create value at the inflection points each time we raise for the companies." — VC5*

#### 4.3.5 Adaptability

Adaptability is a fundamental aspect of the participants' approach to investing. The participants underscored the significance of flexibility in their investment strategies to stay aligned with the ever-evolving landscape.

*"Yeah, I think there's more [technology] now. It's a lot of new techniques, like AI, for example, and also nanotech. It's a lot happening, and the process for drug discovery has shortened significantly. So, in that case, you see a lot of new kinds of companies nowadays for drug discovery, for example. [Investment criteria] has changed a lot." — BA1*



Participants indicate that their investment criteria are dynamic. Changes in the life science landscape, including new scientific discoveries or shifts in policy, prompt a reassessment of what makes a venture attractive for investment.

*"[Life science] is becoming more and more data driven, I would say. A couple of years ago, you would invest in a technical idea. Now, there's a prerequisite that it has its own sort of analytical pipeline. Before, that was optional. Now, it's mandatory that you control the ecosystem. So that has changed." — BA2*

Participants also emphasise the importance of adaptability in maintaining competitiveness within the investment community, allowing them to capitalise on potential opportunities. Furthermore, the evolving nature of the life science sector requires investors to be dynamic in their evaluation processes, ensuring their investment strategies remain aligned with the current state of technology and market needs.

*"We want to really stay at the forefront, and I think one way of doing that is to be very closely connected to the research community. That's where we believe new inventions will come from." — VC3*

#### 4.3.6 Strategic Alignment and Risk Mitigation

The findings from this study emphasise the strategic fit between investors' objectives and the startups' potential to innovate within the life science domain. BAs and VCs are financiers and strategic partners seeking ventures that resonate with their vision for impactful healthcare innovations. This emphasis on strategic compatibility underscores an investment philosophy beyond financial returns, highlighting a collective drive to foster ventures that can deliver substantial societal benefits and economic gains.

### 4.4 Relationships and Networks

#### 4.4.1 Trust Building

Trust building serves as a cornerstone within the investment process, a sentiment articulated by the participants. Building and fostering trust emerged as an indispensable element in the interactions between investors and startups, recognised as a pivotal factor in paving the way for fruitful partnerships.

As one of the BAs expressed, trust formation involves being present, maintaining open lines of communication, and demonstrating genuine care and commitment towards the startups.

*"Yeah, I think, to be honest, and of course, to be there and be open, and that you really care about them and going back if they need something else also. Yeah, it is like, well, relationships, you know." — BA1*

Furthermore, trust was perceived as something delicate, requiring time and consistent engagement to flourish. The participants emphasised that trust is cultivated through transparent and open communication, often nurtured through collaborative projects or interactions that deepen mutual awareness.

*"You have to work with them closely, and then, often, you interact in some sort of project or something that makes you aware of each other. And then, if it progresses towards the correct way, then you have years of sort of assessing them, almost." — BA3*

Maintaining trust throughout the partnership is equally crucial, with investors underscoring the significance of regular updates and responsiveness to feedback. Often emphasised is their active involvement in strategic aspects of the startup.

*"We are very often the lead investor or co-lead investor. So, we are hopefully seen as a collaborator with management, continuously in contact with management, and participating in building clinical strategy, building financial strategy, participating in recruitment at least at the top level. So that's extremely important, and that's a way to build trust." — VC1*

Notably, the impact of trust extends beyond the immediate financial transaction, encapsulating a shared commitment to positively impacting the life science sector. As one participant highlighted, trust is rooted in listening and communicating effectively.

*"Do they listen to investors? That's a very important skill set too, because, like, we are all human, right? We interact and we learn from each other. And if you feel very strongly about something, it's obviously OK, just let us know. We are in this sort of like communication, army trust. We create the trust circle, in a sense, and so that's very important for us." — VC5*

#### 4.4.2 Networking

The significance of collaborative networks within the life science sector was a prominent theme among the participants. These networks, encompassing a range of professional relationships and partnerships, are not just peripheral support structures but central to the strategic operations of investors in identifying, evaluating, and supporting investment opportunities.

*"The thing is, networking is very, very important. Everything is about networking." — BA1*

Participants highlighted the role of these networks in facilitating access to emerging technologies, innovative startups, and essential industry insights. Through these collaborative networks, investors can stay abreast of the latest scientific advancements and market trends, informing their investment decisions. The exchange of information within these networks is crucial for identifying high-potential investment opportunities.

*"Our networks don't just help us decide where to invest; they're also a resource we offer to startups to help them grow and succeed." — VC2*

Moreover, these networks serve as platforms for due diligence, where investors share knowledge and experiences to assess the viability and potential of startups collectively. This collaborative approach to due diligence allows for a more comprehensive evaluation, leveraging the collective expertise and perspectives of a diverse group of investors.

*"It's really crucial, and I think you make much better decisions if you are networking, getting other opinions, and different kinds of experience, and so on. And you also have a lot more possibilities to help the company, of course, because you don't have all the answers by yourself." — VC6*

The role of industry events, workshops, and seminars was also underscored as critical for expanding and nurturing these networks. Such events provide valuable face-to-face interactions, fostering relationships that can lead to future collaborations and investments.

*"Yeah, we operate in the community of investors, and we interact in syndicates with other investors. So, in that way, we have an understanding of what's happening in the financial world, and we go to [life science] meetings where I will participate together with, I think, maybe two or three hundred other individuals. There will be meetings and interactions and so forth. That's, I think, the way we can do it, to have the ear on the rail." — VC4*

The participants underscored the strategic value of leveraging networks for syndication, highlighting the collaborative advantage of co-investing with other investors. Syndication holds strategic importance for its ability to pool collective wisdom, resources, and networks, thereby amplifying the innovation and success potential for the involved companies.

*"We may start a company early on, but as soon as we make a larger investment, we like to do that with other life science VC's and we believe that's a good model because you bring more know-how and networks into the company and you have more brain power around the table." — VC1*

The strategic importance of collaborative networks extends beyond the initial investment decision. These networks become instrumental in providing startups with access to a broader ecosystem of support, including mentorship, industry connections, and additional funding opportunities.

*"Now, with the economy being tough, we help by making warm introductions to other investors through our network. But this also serves as a test for these entrepreneurs to prove that they can attract capital. They must be able to pitch their idea to someone beyond us. While having co-investors that the company can attract is important, it's not our job to secure them, it's theirs." — VC2*

#### 4.4.3 Guidance and Mentorship

The participants' approach to their guidance role in their investments into early-stage life science ventures emphasise a proactive and supportive stance. This role is about financial investment and providing strategic guidance and operational support to the startups they invest.

*"As shareholders, yeah, we are actively involved. We take forward positions, assume management roles, or support in various capacities within the company. So, we have a very active approach, we don't do very many passive investments. And it's not just about giving advice, we also actively seek solutions and do real work in the company." — BA2*

Participants stress the importance of actively participating in the startups' journey, offering mentorship, and leveraging their network to support their growth and development.

*"If you're a first-time entrepreneur and haven't really been exposed to that kind of thinking yet, it's crucial to have someone guide you. But you need others to help you, both with money, of course, but also with expertise and so on." — VC3*

The participants also see their guidance role as an integral part of their investment strategy, aimed at ensuring the success of the startups and contributing to advancing innovation in life sciences. This involves creating a perception of being a good partner, supported by active engagement within the ecosystem.

*"To be an attractive partner, we must be active within the ecosystem and create a perception, which we then support with actions, that we are a good partner. Once we select a company and they become part of our portfolio, we transition into being very active investors. In our investments, we typically always take a seat on the board." — VC2*

#### 4.4.4 Vision Alignment

The alignment of vision between investors and startups is critical in the investment decision-making process. This mutual understanding ensures that both parties are committed to a common goal, facilitating a collaborative journey towards achieving the venture's potential societal impact. Participants highlight the necessity of agreement on several key aspects, such as the business plan, team dynamics, operational conditions, and financial projections, as foundational for their investment decisions.

*"If we are not in agreement with the startup on the business plan, which we need to buy into, and with the people, the conditions, and the financials, we won't invest. It's that simple, really." — BA3*

The conversation around vision extends beyond business metrics, touching on the ethical and societal implications of the ventures. This reflects a desire among investors to connect with their investments on a deeper level.

*"It's crucial that the vision originates from them, from the very beginning, because they need to be truly passionate about this company, believing it's what they want to do. Then, my main focus becomes ensuring that their vision is not only significant but also has the potential to impact many lives meaningfully. For me, that's really important; having a vision is essential because it aligns with my values of leading a meaningful life and making a significant impact." — BA1*

Aligning visions involves engaging in thorough discussions to understand the startup's long-term objectives and ensuring these align with the investor's strategic interests. This alignment is crucial for navigating ventures' inevitable challenges and setbacks. Vision alignment is also a prerequisite for a robust and collaborative relationship between investors and startups. This relationship enables investors to provide practical support and guidance throughout the investment's lifecycle.

*"As long as they are moving in some kind of right direction, helping patients, creating more efficient systems, employing multiscale methods or so, I think that's fine. At the very early stage, they don't need to have a very clear mission statement. What I think is necessary is the dedication and having ambition. So, the entrepreneurs really need to be committed to this, not just something they do on the side while they're involved in research, for example." — VC3*

The participants view vision as a vital determinant of a venture's success. Shared goals and values enhance the venture's chances of success and ensure its meaningful contribution to the life science ecosystem.

*"We're just looking for them to be passionate about their vision, right? To really believe in what they're doing. Because they're going to face hard times. And if they're not super motivated and really want to do this more than anything else, then they're going to want to jump ship when things get hard, because there's always that moment." — VC2*

#### 4.4.5 The Centrality of Trust and Relationships

Trust and effective communication have emerged as central pillars in the formation and longevity of investor-startup relationships. The significance of trust extends beyond the initial investment phase, underpinning the ongoing collaborative dynamics between investors and startups. This finding reflects the integral role of trust in navigating the complexities inherent in life science ventures, reinforcing the importance of building and maintaining solid relational foundations.

### 4.5 Ecosystem Challenges

#### 4.5.1 Geographical Hurdles

Participants reveal several geographical hurdles, as detailed by their experiences. One participant notes the impact of geographical distance on investment management, suggesting that while distance poses challenges in oversight, integrating digital tools has facilitated easier interaction, underscoring the evolving nature of global investments.

*"If you're investing in a startup that's five hours from here or ten hours from here, it becomes more difficult to keep track of it. However, if it's associated with a good university and there are good people behind it, it shouldn't influence it too much. If we need to keep track of something that's far away from our geographical scope, it complicates interactions. But now, with digital tools, you can interact quite easily." — BA2*

The economic context of investments, especially the comparison between the operational costs in different countries, emerges as a critical factor. This participant highlights startups' strategic allocation of resources in response to economic disparities. This approach reveals the calculated manoeuvres investors undertake to maximise their operational efficiency and financial investment.

*"Norway is significantly expensive. I worked for a Norwegian startup, so I think they are more inclined to establish some of their operations here. And there, they have more financial*

*resources. So, they're investing their money here. What does an employee cost, and what do you get for your investment? So far, if there was a neighbouring country that was relatively poorer, they could get more value there."* — VC2

Legal frameworks and the need for meticulous legal reviews in cross-border investments are highlighted, highlighting the importance of navigating legal differences between countries.

*"If your company is located in another country, there are some legal differences, yeah. Legal differences that you need to address, and there might be a cross-country element. You need to include stipulations in an agreement, for example, and it hasn't limited our investment approach, I would say. However, you should have your lawyers review the agreements."* — VC3

The value of geographical proximity for fostering personal connections and facilitating face-to-face meetings is a significant challenge in cross-border investments.

*"It's more challenging, I think, geographical limitations aren't just about demand. It's also the physical barrier. For us, meeting someone in person is easier."* — VC5

The strategic considerations for Nordic companies contemplating expansion into European markets are discussed. This quote reveals the cautious approach taken by companies as they navigate the complexities of scaling beyond their initial regional base.

*"The typical strategy among Nordic companies is to begin in the Nordic environment initially because that's where you have your contacts and so forth. So, expanding into Europe can be somewhat complicated."* — BA3

#### 4.5.2 Regulatory Navigation

In early-stage life science ventures, navigating the complex regulatory environment is essential to investment decision-making. Insights from participants shed light on the diverse regulatory challenges encountered across different regions and sectors within the life sciences, emphasising the critical nature of regulatory compliance and strategic planning.

One participant draws attention to the significant shift in regulatory requirements for MedTech products in the European Union from the Medical Devices Directive (MDD) to the Medical Device Regulation (MDR). This highlights the complexities and delays in obtaining necessary certifications through notified bodies.

*"One problem has been the MDR for MedTech. MedTech products, you know, they transitioned from MDD to MDR, and you need a notified body, which is a very slow and lengthy process." — BA1*

The contrast in regulatory landscapes between the United States and Sweden is highlighted, focusing on the challenges of navigating the Swedish healthcare system. This insight reveals the hurdles in moving from pilot projects to broader business expansion, as well as the preferences of investors regarding local success before international market entry.

*"The regulation is easier in the US, but then, of course, there are lots of other factors to consider. Perhaps you also need US investors and so on. So, there's a significant gap there." — VC5*

The aversion to investments in companies facing heavy regulatory burdens is articulated, emphasising the inefficiency and potential financial drain of navigating extensive local regulations that may not align with broader EU or US standards.

*"I don't engage with companies that face heavy regulatory burdens because dealing with extensive local regulations can result in a significant waste of time. Additionally, if the local regulations are not compliant with EU or US standards, it makes me uninterested in such investments. The reason being, you might end up spending a substantial amount of money just to enter the local market, which may be relatively small." — VC6*

Reflecting on past investment experiences, a participant shares a cautionary tale about underestimating the impact of regional healthcare policies on business models. This narrative underscores the importance of thorough due diligence in assessing regulatory risks.

*"We've made poor investments before, and I'll give you an example. The company had a business model reliant on regional healthcare policies, offering private healthcare options. One of the identified risks at the time, was the possibility of a policy shift that could significantly alter the business model and subsequently impact the company's revenue. While it was considered a potential scenario, we didn't anticipate it happening. In retrospect, it's arguable that we may not have conducted thorough due diligence, as we could have potentially foreseen the policy shift occurring sooner." — VC2*

The long and arduous regulatory journey for pharma and biotech ventures is mentioned, emphasising the necessity for comprehensive planning that encompasses financial and regulatory considerations throughout the product development lifecycle.



*"For pharma and biotech, it typically takes up to 10 years to progress through phase three. It's very easy to get excited about the project in the beginning because the science is so cool. There are so many breakthroughs. You want to make sure that the founder has thought about the whole, sort of complete journey. That means you need to have a full plan, including the financial and regulatory needs along the way." — VC4*

#### 4.5.3 Ecosystem Influence

The influence of the ecosystem on early-stage ventures within Sweden is an important talking point with participants. One participant comments on the cost dynamics in Sweden versus the United States, highlighting the cheaper research-related expenses in Sweden and noting the higher external expertise costs. This perspective sheds light on Swedish companies' challenges when comparing themselves to their US counterparts, especially regarding funding and valuation.

*"Things are cheaper, especially in the research side in Sweden compared to the US, where it's more expensive to employ people or have a location, even experiments and reactions that you don't do in-house." — VC3*

The role of university spinoffs in the Swedish ecosystem is highlighted, emphasising the importance of local investor involvement, from angel investors to institutional entities. This engagement is crucial for nurturing these ventures.

*"More than half of the companies formed in Sweden originate from university spinoffs. Hence, it's crucial to have local investors, not only angel investors but also institutional investors, actively involved in the ecosystem." — VC5*

Support structures within Sweden are robust, supported by experienced BAs, knowledge resources, and various institutions, which collectively contribute to the growth and development of early-stage companies.

*"In Sweden, we have a strong ecosystem for companies, supported by a wealth of experienced business angels and ample knowledge resources. Entities like [VC firm], [Pharmaceutical company], and Europe innovation hubs, along with European Investment institutions and banks, provide valuable support up to a certain extent." — BA1*

The quality of innovation in Sweden, especially originating from universities, is recognised by the participants as having high international standing. This quality is not seen as the limiting factor, but rather, the challenge lies in scaling up within a relatively small local market. However, this market size can also be advantageous, allowing for thorough local testing before international expansion.

*"We have very strong innovation in Sweden, and we are even quite highly ranked internationally. So, from that perspective, I think the quality coming from the universities is high. It's not like we're lacking good ideas. And then we have a small market, which is both an advantage and a disadvantage because it's difficult to scale up quickly. But it gives us the chance to really test it here, on the local market." — VC3*

Confidence in the innovation coming out of Sweden is high among participants, along with a belief in finding clinical researchers capable of demonstrating the international viability of these innovations.

*"We have large universities, and we feel confident that we can find whatever type of clinical researcher that can test it and show that it works internationally. So, I trust innovation coming from Sweden quite well." — VC4*

#### 4.5.4 Local Hurdles

While rich in innovation and potential, the Swedish life science ecosystem confronts several local hurdles that shape the landscape for early-stage ventures. Participants shared their perspectives on challenges within the Swedish life science ecosystem.

One notable challenge is the structural and cultural dynamics around equity and invention within the academic sphere. The teacher's exemption, a unique aspect of the Swedish system, allows original inventors to own the intellectual property of their discoveries without the necessity for active involvement or contribution to the venture's growth.

*"In Sweden, we have a dynamic where the professor's privilege applies, and there is no vesting incentive. They can sit with their 40-50% shares, state to the original inventors, and do nothing. However, 1% of something substantial holds significant value, while 1% of an underperforming business where someone is merely holding onto it in their lab is worth very little." — VC2*

The gap in experienced management, particularly in steering companies through the critical early and growth stages, emerges as a significant hurdle. This challenge draws a comparison to the United States, which participants perceived to have a more abundant pool of seasoned professional managers.

*"The most common challenge we encounter with Swedish investments is the lack of experienced management, especially in the early stages. The preclinical science quality in Sweden is undoubtedly high. However, when it comes to effectively running and managing companies through various cycles, there is still a deficiency. It's essential to have the*

*experience needed to bring a product to market in different regions, and this requires international experience. When comparing the US to Sweden, it can be argued that the US has a higher density of experienced professional managers, and this is not limited to Sweden alone." — BA2*

Securing capital, particularly from international sources for substantial funding needs, is highlighted as a considerable obstacle. While Swedish life science spinouts flourish, the journey to attract significant investment becomes increasingly challenging as the venture scales up.

*"Sweden has a significant number of life science spinouts. However, securing capital from foreign countries, especially for larger funding needs, can be challenging. It's fine for a company up to a certain point, but when you require more substantial funding, it becomes really tough to find the right venture capitalists." — BA3*

The small and interconnected nature of the Swedish life science community can also present difficulties, particularly in situations where ventures receive negative feedback or fail to secure investment from one party, potentially influencing other potential investors' perceptions.

*"In Sweden, it's a small community, so once a case gets a bad name, then it gets tough. Also, that can act against you because then they're like, 'Oh, we looked at that. Yeah, I don't believe in it.' And then you're like, 'They don't believe in it. I don't believe in it.' Then it creates this kind of situation, which is difficult for the entrepreneurs in Sweden because you can't just go shop around now when times are tougher. You pick your first option, and the rumour will go that you talked to them first. Then, when you go to the second one, they might say, 'Hey, but I heard that the first one told you no.'" — VC4*

#### 4.5.5 Navigating Ecosystem Challenges

Highlighted in this study are the various ecosystem challenges that critically inform investment decisions, including regulatory landscapes, the necessity for cross-sectoral collaborations, and the specificities of operating within the Swedish and Nordic innovation ecosystems. These challenges are viewed through a strategic lens, with the ability to adeptly navigate these considerations as a key indicator of a startup's resilience and strategic prowess, ultimately influencing its attractiveness to investors.

#### 4.6 Summary of Findings

This research into the decision-making criteria of BAs and VCs within Sweden's life science sector has uncovered a nuanced investment landscape characterised by strategic, relational, and ecosystemic

considerations. Obtained from in-depth interviews with industry investors in the life science sector, the summary below encapsulates the pivotal findings of this study.

Owing to their amassed years of industry involvement, the participants possessed a profound understanding and expertise of the investment landscape within Sweden's life science sector, showcasing their expertise in this domain. The participants' varied backgrounds and knowledge enriched the study with a nuanced comprehension of the investment dynamics prevailing in the Swedish life science sector. This diversity in participant experience and knowledge significantly contributed towards achieving the study's aim of exploring the key decision-making criteria employed by BAs and VCs when evaluating potential startups for investment within this sector.

## Chapter 5: Discussion

### 5.1 The Decision-Making Criteria of BAs and VCs

The analysis of semi-structured interviews with BAs and VCs in Sweden has revealed a set of key decision-making criteria critical for assessing life science startups for potential investment. These criteria—risk appetite, science and technology evaluation, financial viability, milestone achievement, adaptability, trust building, networking, guidance, mentorship, and vision alignment—demonstrate a holistic approach to investment decision-making, integrating financial, strategic, and operational considerations, consistent with the comprehensive nature of investment evaluation as highlighted by Arachchi and Nimesha (2022) and the importance of balancing financial and strategic assessments as discussed by Kaplan and Schoar (2005).

These criteria were predominant factors leading BAs and VCs to decide if they should invest in a life science startup. Furthermore, ecosystem challenges such as geographical hurdles, regulatory navigation, ecosystem influence, and local hurdles were core challenges that made it more difficult for BAs and VCs to consider investment in startups.

Exploring core investment strategies among BAs and VCs reveals a nuanced understanding of risk appetite as a pivotal criterion guiding their decision-making processes. Influenced by various factors, including previous investment outcomes, the strategic focus of their portfolios, and their broader objectives of contributing to medical advancements, this diversity in risk tolerance underlines the complexity of strategies deployed by investors to navigate the life science investment ecosystem. The prioritisation of scientific and technological merits alongside financial viability assessments is crucial in attracting investments, with investors seeking evidence of innovation through scientific results and publications in prestigious journals. The importance of a clear intellectual property strategy is

underscored as a critical factor in safeguarding the commercial potential of innovations (Kaplan & Stromberg, 2003; Powell et al., 2005; Metrick & Yasuda, 2021). Contrary to previous studies that primarily emphasise the financial aspects of investment decisions, this study highlights a broader set of considerations. While financial returns remain a core objective, a commitment exists to advance healthcare and medicine through investments in life sciences, reflecting a more profound, value-driven approach to risk-taking. This approach aligns with the global shift towards impact investing, where the societal benefits of investments are considered alongside financial gains. The intricate link between risk appetite and the potential for scientific innovation and societal impact challenges the traditional view of risk in venture capital and angel investing, suggesting a strategic shift in the life science sector towards a more integrated and impact-focused evaluation of investment opportunities (Gompers & Lerner, 2001; Hellmann & Puri, 2002).

The assessment of science and technology by BAs and VCs is a fundamental aspect of their investment decision-making process. This deep dive evaluation highlights the investors' dual commitment to fostering innovation and addressing real-world healthcare challenges, emphasising ventures with robust scientific foundations and the potential for significant technological advancements. This focus bridges the gap between scientific excellence and commercial viability, reflecting a broader investment ethos to leverage scientific discoveries' intrinsic value for practical healthcare solutions (Kaplan & Schoar, 2005; Hellmann & Puri, 2002). The preference for startups from vibrant research environments indicates a belief in the correlation between ecosystem health and technological innovation. This shows investors' inclination towards ventures that promise financial returns and substantial contributions to medical science and patient care. This study's findings spotlight a comprehensive evaluation strategy integrating scientific inquiry and technological innovation, deviating from the literature that predominantly emphasises the financial aspects of investment decisions (Gompers & Lerner, 2001). This nuanced approach signals a shift towards impact investing, juxtaposing societal benefits with financial returns and challenging traditional assessment models for venture capital risk (Sahlman, 1990). The emphasis on intellectual property, including patents, illustrates the critical interplay between securing commercial viability and promoting innovation, with Sweden's life science sector as a nexus for technological advancement and investment. By aiming to mitigate the inherent risks of early-stage investments and aligning with goals to advance healthcare, this strategy underscores the pivotal role of innovation in investment decisions and the sector's future.

Financial viability is a cornerstone in the decision-making frameworks of BAs and VCs, encompassing a thorough evaluation of startups' financial health, scalability, and the coherence of their financial

strategies. This in-depth analysis underlines the importance of balancing scientific discoveries' intrinsic value with their practical applicability in healthcare, signalling a broader investment strategy aimed at fostering innovation and addressing healthcare challenges through ventures with solid scientific foundations and potential for significant technological advancements (Gompers & Lerner, 2001; Kaplan & Stromberg, 2004). The literature supports the significance of sound financial planning and realistic valuation in attracting investment, emphasising the need for startups to balance incentives for the founding team with valuations that reflect market realities, especially in the life sciences sector where market conditions significantly influence fundability perceptions (Hochberg et al., 2007; Sahlman, 1990). This comprehensive approach to financial viability highlights the importance of a forward-looking perspective, crucial in a sector marked by long development timelines and substantial capital requirements for innovation. Such a strategy aims to mitigate risks and aligns with the overarching goals of advancing healthcare innovations that promise long-term societal benefits, positioning financial viability as a critical filter through which potential investments are evaluated. This focus on financial health, strategic funding milestones, and market positioning reflects a broader investment philosophy within Sweden's life science sector, emphasising the role of robust financial planning in fostering innovation and ensuring the sector's sustainability (Hellmann & Puri, 2002; Lerner, 1994).

The focus on milestone achievement by BAs and VCs establishes a methodical framework for evaluating a venture's progress, technological validation, and market readiness. Emphasising specific, predefined milestones, especially those related to clinical trials and regulatory approvals, underscores the importance of tangible progress in a sector known for its inherent risks. This investment strategy, which sees milestones as crucial indicators of venture success, aims to mitigate risks while optimising potential valuation increases at crucial development phases, resonating with the literature that considers milestone-based funding essential in life sciences due to prolonged development times and significant uncertainties (Kaplan & Stromberg, 2003; Hellmann & Puri, 2002). Furthermore, the interaction between investors and startups concerning milestones signifies a partnership beyond financial support. BAs and VCs provide strategic guidance and network leverage to enhance the venture's value and market appeal, illustrating a comprehensive risk mitigation tool and improving venture credibility. This approach is supported by research emphasising the need for concrete progress measures in investment decision-making. Thus, milestone achievements validate a venture's operational viability and potential to impact the healthcare industry significantly. The emphasis on this criterion by Swedish BAs and VCs reflects an advanced investment philosophy, aiming to balance sector-specific risks with the rewards of supporting innovative healthcare solutions. This strategic and operational focus on milestones demonstrates the nuanced

considerations guiding investment decisions in the dynamic life science sector (Collewaert & Manigart, 2015; Amit et al., 1998).

Flexibility within the investment strategies of BAs and VCs is pivotal, enabling them to navigate rapid technological advancements and regulatory changes. This adaptability is crucial for seizing opportunities in emerging areas like digital health, artificial intelligence (AI), and nanotechnology, reflecting a strategic intent to remain competitive in the fast-evolving life science sector (Arachchi & Nimesha, 2022; Bengtson et al., 2022). The shift towards data-driven decision-making and the integration of digital solutions underscores the sector's dynamic nature, requiring investors to maintain a proactive stance in engaging with the research community and anticipating new inventions. This commitment to staying at the forefront of science and technology underpins a successful investment strategy in life sciences, highlighting the significance of adaptability in aligning with future trends and innovations (Bonini & Capizzi, 2019; Dhochak & Sharma, 2016). Moreover, the ability to adapt extends beyond technology to encompass regulatory, market, and ecosystem dynamics, which is essential for navigating the global nature of the life science industry. Investors' flexibility in adjusting their strategies to diverse regulatory landscapes is a critical factor in successful international expansion and investment strategies, facilitating the capitalisation on emerging trends and ensuring that investment approaches are resilient and responsive to the sector's multifaceted challenges (Gompers & Lerner, 2001; Kaplan & Stromberg, 2004). The criterion of adaptability thus emphasises the dynamic interplay between investors' strategic flexibility and the continually evolving life science sector, reinforcing the importance of a proactive and flexible investment approach. This adaptability not only aids in capturing emerging innovations but also ensures that investment strategies are well-suited to navigate the complexities of the global life science ecosystem, fostering innovation and advancing healthcare technologies (Hellmann & Puri, 2002; Hochberg et al., 2007).

Trust is a foundational element within the investment relationships of BAs and VCs, emphasising more than just financial transactions to encompass mutual respect, open communication, and shared objectives. This trust is cultivated through ongoing, transparent interactions, underscoring its importance in fostering productive partnerships between investors and startups (Mason & Harrison, 2002; Sapienza & Korsgaard, 1996). Trust facilitates cooperation, reduces transaction costs, and addresses information asymmetry risks, proving critical in a sector where product development's long timelines and complexity necessitate reliable relationships (Zacharakis & Shepherd, 2001; Arthurs & Busenitz, 2003). Trust's significance extends beyond individual relationships to influence the broader investment climate, contributing to a collaborative ecosystem that enhances the sector's innovation and growth potential (Batjargal, 2003; Bengtson & Raza-Ullah, 2016). Active investor

involvement as advisors and partners, contingent upon a trust foundation, enables strategic discussions and feedback responsiveness that align and commit both parties to the venture's success (Hochberg et al., 2007; Lerner, 1995). This dynamic underscores a sophisticated investment philosophy prioritising long-term societal benefits alongside financial returns, aligning with goals to foster groundbreaking healthcare solutions (Hellmann & Puri, 2002; Sahlman, 1990).

BAs and VCs highlight the strategic role of networking as a pivotal element in their investment decision-making process. Networking is more than just connections; it is a crucial mechanism for accessing innovative technologies, identifying promising startups, and staying abreast of industry trends and scientific advancements. This collaborative nature of networks significantly enhances investors' capability to make informed decisions by leveraging collective expertise and insights (Sapienza & Korsgaard, 1996; Batjargal & Liu, 2004). The dual role of networking, as both a vital source of information for investment decisions and a significant resource for startups' growth, underscores the symbiotic relationship between investors and portfolio companies, guiding them through market entry, scaling, and regulatory navigation (Mason & Harrison, 2002; Hochberg et al., 2007). The collaborative approach to due diligence, facilitated by networking, allows investors to collectively assess the viability and potential of startups, thereby mitigating risks and enhancing the thoroughness of the investment evaluation process (Bruton et al., 2009; Mason et al., 2019).

Moreover, strategically leveraging networks for syndication exemplifies the collective strategy of risk mitigation and resource maximisation, amplifying innovation and success potential (Bergemann & Hege, 1998; Sørensen, 2007). Literature supports the centrality of networking in venture capital and angel investing ecosystems, highlighting networks as integral to the strategic operations of investors, facilitating the identification, evaluation, and support of investment opportunities, especially in the life science sector with its reliance on cutting-edge research and complex regulatory environments (Harrison & Mason, 2000; Zhang & Zhang, 2021). Consequently, networking emerges as a foundational component of the investment landscape, bridging scientific innovation and market realisation, underscoring the interconnectedness of the investment community in fostering a vibrant ecosystem conducive to innovation and growth (Powell et al., 2005; Yang et al., 2021).

BAs and VCs' guidance and mentorship are pivotal in the investment process to encompass a commitment to startups' holistic development. This engagement, characterised by strategic advisory and operational support, is predicated on the belief that a startup's financial success is deeply intertwined with its operational and strategic robustness (Mason & Harrison, 2002; Sapienza & Korsgaard, 1996). Active mentorship, described by participants as proactive and collaborative, often sees investors stepping into management or advisory roles to guide startups toward sustainable



growth and innovation, highlighting mentorship's distinctive role in maximising innovation potential (Malmgren et al., 2010; Mason, 2008). The literature reinforces the significance of this guidance, noting its essential role in reducing startup failure rates and bolstering the chance of success through navigating market challenges, refining business models, and achieving operational excellence. Furthermore, this mentorship fosters innovation and collaboration within the ecosystem, enhancing the sector's capacity for innovation and growth (Hochberg et al., 2007; Mason & Botelho, 2019). The reciprocal nature of this engagement demands openness and proactivity from startups in leveraging the resources and networks provided, underscoring a comprehensive investment philosophy that extends beyond financing to shape the future of healthcare innovation through collaborative effort and strategic guidance (Bergemann & Hege, 1998; Hellmann & Puri, 2002).

Vision alignment between VCs, BAs, and startups is paramount as it is the foundation for collaborative and unified efforts towards realising ventures' potential and societal impacts. This alignment ensures a shared commitment to the ventures' business models and broader ethical and societal implications, as investors desire a deeper engagement with their investments that transcends business metrics to include contributions to society (Mason & Harrison, 2002; Batjargal & Liu, 2004). The significance of shared vision becomes particularly pronounced as ventures face inevitable challenges, where maintaining a long-term perspective and stability is crucial for success. This shared perspective fosters effective collaboration, offering support and guidance through the investment lifecycle and enhancing the ventures' prospects for success and impact on healthcare innovation (Hochberg et al., 2007; Sapienza & Korsgaard, 1996). Literature reaffirms the importance of vision alignment in venture success, especially within high-risk sectors like life sciences. Shared goals and values improve the chances of the ventures' success and ensure meaningful industry and societal contributions. This alignment is crucial for a robust and supportive investor-startup relationship, enabling ventures to navigate the complexities of the life science sector with clarity and shared direction (Zacharakis & Shepherd, 2001; Arthurs & Busenitz, 2003). The emphasis on vision alignment underscores the need for shared objectives and values between investors and startups, which is crucial for fostering successful partnerships and guiding ventures through challenges. This strategic investment approach, prioritising mutual understanding and shared aspirations, highlights the significance of vision in the investment decision-making process, reflecting a deep understanding of the dynamic interplay between personal, professional, and ethical considerations in shaping the future of healthcare innovations (Mason et al., 2019; Bergemann & Hege, 1998).

## 5.2 Navigating Information Asymmetry and Strategic Investment Decisions

The exploration of BAs' and VCs' decision-making criteria underscores the multifaceted nature of investment decisions that balance financial, strategic, and operational considerations. This complexity is inherent in agency theory, which postulates that the relationship between principals (investors) and agents (entrepreneurs) is fraught with challenges such as information asymmetry and conflicting interests (Eisenhardt, 1989). The criteria identified, ranging from risk appetite and financial viability to trust building and vision alignment, reflect an intricate web of considerations to mitigate agency costs and ensure alignment between investors and startups.

Agency theory suggests that risk appetite is influenced by previous investment outcomes and the broader objectives of contributing to medical advancements (Kaplan & Stromberg, 2003). This aligns with the findings from the interviews, where BAs and VCs highlighted the importance of science and technology evaluation, reflecting a commitment to innovation and societal impact beyond just financial returns. This dual focus indicates a strategy that seeks to balance the pursuit of financial gain with the advancement of healthcare, resonating with the concept of impact investing (Hellmann & Puri, 2002).

The emphasis on milestone achievement and adaptability further exemplifies the application of agency theory in practice. Milestone-based funding, a common contractual mechanism in the VC/BA-entrepreneur relationship, serves as a tool to reduce information asymmetry and align incentives by linking capital provision to the achievement of specific, predefined objectives (Kaplan & Stromberg, 2003; Lerner, 1994). Similarly, adaptability reflects the necessity for both investors and startups to navigate the unpredictable nature of the life science sector, requiring a flexible approach to manage the inherent uncertainties and maintain alignment over the long term (Bergemann & Hege, 1998).

Trust building and networking are crucial for facilitating effective communication and reducing the perceived risks associated with information asymmetry. These elements underscore the importance of social capital and relational contracts in overcoming the limitations of formal mechanisms in agency relationships (Batjargal & Liu, 2004; Mason & Harrison, 2002). The cultivation of a shared vision between investors and entrepreneurs is also critical for ensuring strategic alignment and commitment to the venture's goals, reflecting a deep understanding of the nuanced dynamics that characterise successful investment relationships in the life science sector (Sahlman, 1990; Arthurs & Busenitz, 2003).

The decision-making criteria used by venture BAs and VCs exemplify the application of agency theory to navigate the intricate principal-agent dynamics characteristic of venture financing. These criteria

are strategically designed to reduce agency costs and cultivate a synergistic relationship between investors and entrepreneurs, thereby driving innovation and growth within the sector. The thoughtful consideration of financial, strategic, and ethical factors demonstrates a comprehensive approach to minimising agency costs while amplifying societal benefits. These considerations highlight the necessity for a paradigm shift towards investment strategies that are both integrative and impact-oriented, striking a balance between the risks associated with life science ventures and the benefits of fostering groundbreaking healthcare innovations.

### 5.3 Challenges Affecting Decision-Making

BAs and VCs confront significant geographical hurdles that impact their investment decision-making processes. Agency theory, highlighting the principal-agent relationship and the need to mitigate information asymmetry between investors and entrepreneurs, becomes especially important in this context. The physical distance between innovation hubs and potential investment opportunities poses substantial barriers to adequate due diligence, relationship building, and ongoing investment management. To overcome these challenges, BAs and VCs often rely on local networks and intermediaries (Arachchi & Nimesha, 2022), as well as digital platforms for communication and project management (Baker et al., 2020), which serve to bridge geographical divides and ensure close relationships and flow of information. This strategic use of networks and technology not only aids in overcoming geographical barriers but also plays a critical role in reducing the agency costs associated with long-distance investment management (Bengtson et al., 2022).

Furthermore, investors are tasked with integrating financial, strategic, and ethical considerations into their decisions, weighing the benefits of investing in geographically distant, high-potential ventures against the increased costs and complexities of managing these investments from afar. This delicate balance advocates for a strategic shift towards more integrated and impact-focused investment strategies, considering financial returns and the broader implications of fostering innovation in the life sciences (Hellmann & Puri, 2002). Through leveraging innovative strategies that align with agency theory principles by addressing information asymmetry and reducing uncertainties (Arthurs & Busenitz, 2003), BAs and VCs can effectively navigate the complexities introduced by geographical distances, contributing to the overarching goal of driving innovation and growth within the life science ecosystem.

Regulatory challenges significantly impact BAs and VCs, influencing their investment decision-making and directly affecting venture feasibility, timing, and success. The sector's complex regulatory landscape demands startups to innovate and adeptly manage regulatory compliance and market

entry, making regulatory navigation a critical determinant of venture attractiveness and investment viability. This regulatory adeptness, seen as both a compliance necessity and a strategic advantage, aligns with agency theory's aim to reduce information asymmetry between investors and entrepreneurs, highlighting the importance of selecting startups with clear regulatory strategies to mitigate risks of non-compliance and delays (Aernoudt, 2005; Gompers & Lerner, 2001; Jensen & Meckling, 1976; Kaplan & Stromberg, 2004).

Efficient regulatory navigation enhances a startup's market entry speed and competitiveness, reflecting a deep investor understanding of the sector's unique challenges. Agency theory further underscores the significance of aligning investor risk mitigation strategies with startups' operational capabilities, emphasising a collaborative approach to overcoming regulatory hurdles, thereby driving sector innovation and growth (Arthurs & Busenitz, 2003; Hellmann & Puri, 2002; Eisenhardt, 1989). This perspective on regulatory navigation as integral to investment strategies showcases the balance between managing inherent risks and capitalising on the opportunities for transformative healthcare innovations.

The ecosystem's influence significantly shapes the investment strategies of BAs and VCs, encompassing regulatory environments, market dynamics, technological advancements, and talent availability. Navigating this complex ecosystem requires investors to balance innovation pursuit with risk mitigation, necessitating a strategic investment approach informed by agency theory to manage uncertainties and information asymmetries (Bengtson et al., 2022; Kaplan & Schoar, 2005). Investors utilise their networks, expertise, and resources to bridge knowledge gaps, favouring startups that demonstrate scientific and technological prowess and a keen understanding of ecosystem intricacies. This alignment with well-navigated startups allows BAs and VCs to manage agency costs effectively and meet financial and strategic goals (Hellmann & Puri, 2002; Jensen & Meckling, 1976). Strategic partnerships within the ecosystem, signalling operational excellence and innovation, render startups more attractive, reducing investment risks in line with agency theory principles (Kaplan & Stromberg, 2004; Sahlman, 1990). Agency theory explains BAs and VCs' approach to the principal-agent relationship, emphasising strategic, informed decisions that consider ecosystem dynamics, enhancing sectoral growth and innovation, and highlighting the pivotal role of ecosystem engagement and strategic adaptability in successful life science investments.

BAs and VCs face local hurdles that crucially shape their investment strategies. Structural and cultural dynamics within academia, notably the teacher's exemption, allow inventors to retain intellectual property rights without active venture involvement (Act on the Right in Employee Inventions, 1949), potentially stifling growth by keeping substantial equity inactive. This situation calls for a refined

approach to intellectual property management and incentivisation to ensure active stakeholder contribution (Arvidsson et al., 2016; Bengtson et al., 2022). Additionally, the challenge of finding experienced management for venture development, particularly in comparison to the United States, which has more abundant seasoned professionals, highlights a critical gap in the operationalisation and scaling of innovations within Sweden. The difficulty in attracting significant international capital for scaling ventures and the small, tightly-knit nature of the Swedish life science community, where negative perceptions can quickly spread, further complicates the investment landscape (Ari et al., 2001; Isaksson et al., 2004). Addressing these challenges necessitates a strategic approach that extends beyond financial and technological assessments to include a deep understanding of local ecosystem intricacies. Agency theory suggests strategies for reducing information asymmetry and aligning investor-entrepreneur interests, advocating for transparent communication, robust management teams, and strategic navigation of intellectual property and funding challenges. This comprehensive approach not only aims to mitigate agency costs associated with local hurdles but also fosters the sector's growth and innovation, underscoring the pivotal role of BAs and VCs in surmounting barriers to support transformative healthcare solutions (Arthurs & Busenitz, 2003; Hellmann & Puri, 2002).

#### 5.4 Research Limitations

Despite rigorous efforts to comprehensively explore VC and BA decision-making criteria within Sweden's life science sector, this study encountered several unavoidable limitations. A primary constraint was the sample size, which, while sufficient to capture a broad spectrum of insights, may limit the strength of the findings. The challenges of engaging a larger participant pool were compounded by the specificity of the study's focus on the Swedish life science sector, where BAs and VCs are highly selective and protective of their investment strategies. Furthermore, the six-month duration of this study, encompassing ethics approval and data collection, restricted the potential to expand the participant base.

The sensitive nature of investment decision-making in the life science sector posed another limitation. Participants may have been reluctant to disclose open and detailed insights into their decision-making processes fully. They were wary of revealing commercially sensitive strategies or potentially critiquing their peers and investment practices. This caution might have led to "tactical answering," where responses were possibly more guarded or tailored to present a socially desirable image rather than reflecting the nuanced realities of their investment criteria (Diefenbach, 2008).

Moreover, the reliance on participants' recollections introduced the potential for memory bias, where details of decision-making processes could have been unintentionally glossed over or inaccurately represented. This limitation is inherent to qualitative research relying on retrospective accounts, especially when discussing complex and strategic decisions in dynamic investment environments.

Another limitation of this study stems from the disparity in the sample sizes of BAs and VCs participating in the research. With six VCs and only three BAs able to contribute, the study faced challenges in achieving a balanced comparative analysis between these two distinct groups of investors. This disparity in sample size limited the depth and breadth of the analysis that could be undertaken, thereby precluding a detailed comparison of the decision-making processes between BAs and VCs. Consequently, while the findings offer preliminary insights into the criteria and considerations of both BAs and VCs, the limited representation, particularly of BAs, might not fully encapsulate the diversity of perspectives and approaches employed across the investment community. This imbalance underscores the need for caution in interpreting the comparative findings. It suggests an area for future research to explore the decision-making dynamics of BAs and VCs more equally and comprehensively in the life science sector.

Finally, the study's focus on Sweden's unique life science sector, while a strength in depth and specificity, limits the findings' applicability to other geographical contexts or sectors. The purposive sampling strategy, essential for capturing detailed insights into this niche area, further constrains the generalisability of the research outcomes. As such, the decision-making criteria uncovered in this study are closely tied to the specificities of Sweden's innovation ecosystem and may only directly translate to other settings with careful consideration of local contextual differences.

These limitations notwithstanding, the study contributes valuable insights into the decision-making criteria of BAs and VCs in Sweden's life science sector, offering a foundation for further research to build upon and explore in greater depth.

## Chapter 6: Conclusions and Implications

### 6.1 Overall Conclusions

This study reveals the key decision-making criteria of BAs and VCs within Sweden's life science sector, an essential sector for the nation's innovation ecosystem and economic proliferation. The research showcases how BAs and VCs, as pivotal players in this ecosystem, navigate the sector's inherent risks and substantial development needs, offering more than just financial capital. They provide strategic

support essential for manoeuvring the complexities of the life science domain, thereby bolstering Sweden's economic landscape. By delving into the criteria and strategies employed by these investors, the findings enrich the scholarly understanding of how investment decisions in the life science sector are sculpted, emphasising the significance of comprehensive evaluations that extend beyond financial metrics to include considerations like risk assessment, technological potential, and sector-specific challenges.

The analysis further highlights the multifaceted nature of these investment decisions, revealing that BAs and VCs weigh multiple factors, including scientific merit, financial viability, and the potential for sectoral contribution, to make informed choices about their investments. Challenges within the ecosystem, such as regulatory navigations and market entry barriers, have been identified by this study, illustrating the critical role of BAs and VCs in surmounting these obstacles to foster innovation and growth. By focusing on the investment strategies and decision-making processes of BAs and VCs, this research contributes to the existing literature, offering insights into the intricacies of funding dynamics within Sweden's life science sector. It paves the way for future inquiries aimed at refining these investment interactions, ultimately enhancing the sector's capacity for innovation and reinforcing Sweden's stature as a leader in life science advancements.

## 6.2 Practical Implications

This research offers invaluable insights into the decision-making criteria of BAs and VCs within the dynamically evolving Swedish life science sector. This study underscores the importance of developing comprehensive due diligence processes, fostering strategic partnerships, and investing in knowledge and expertise within the life science ecosystem. By understanding the critical factors that BAs and VCs consider when assessing potential investments, this research highlights the necessity for investors to adopt a multifaceted approach beyond financial considerations. Incorporating a robust evaluation of technological innovation, market potential, regulatory compliance, and the venture's capability to address unmet medical needs is crucial. This comprehensive evaluation strategy enables BAs and VCs to identify ventures with the highest potential for success and contribute actively to the ventures' growth trajectories through strategic guidance, network access, and operational expertise. Furthermore, this study encourages BAs and VCs to prioritise ethical investment practices and transparency to build trust and credibility in the life science ecosystem (Westlund et al., 2014; Ministry of Enterprise and Innovation, 2020).

Furthermore, the insights gained from this study benefit investors and offer a valuable perspective for the broader ecosystem, including policymakers, industry associations, and academic institutions

involved in Sweden's life science sector. Understanding the investment landscape's complexities and the strategic alignment between VCs, BAs, and life science ventures enables these stakeholders to foster an environment conducive to successful investments and innovation growth. Policymakers, for instance, can leverage this knowledge to refine regulatory frameworks and support mechanisms, ensuring they align with the investment criteria and challenges identified, thereby enhancing the sector's attractiveness to domestic and international investors. Moreover, this research contributes to the academic and practical discourse on investment dynamics within the life science sector, offering a foundation for future studies to optimise investment strategies and interactions. As BAs and VCs navigate the Swedish life science investment ecosystem, equipped with the insights from this study, they are better positioned to engage in successful partnerships that drive forward the sector's innovation, contributing to Sweden's economic development and positioning as a leader in life science innovation.

### 6.3 Future Research Directions

This study paves the way for several promising avenues for future BA and VC decision-making research in Sweden's life science sector. Given the study's pioneering exploration into the decision-making criteria of BAs and VCs, future research could expand upon this foundation to address some of the methodological and thematic limitations encountered. For instance, a case-study approach could offer a more granular understanding of the decision-making process by allowing in-depth analysis of specific investment scenarios (Arvidsson et al., 2016). This method is notably time-intensive, so future research could consider a mixed-methods approach that combines the depth of case studies with the breadth of survey or quantitative data analysis. This method could provide real-time insights into the complex interplay of factors influencing BAs and VCs, enhancing the richness of data collected through direct observation and involvement.

Additionally, recognising the imbalance in the sample sizes of BAs and VCs in this study, future research could achieve a more equitable distribution, facilitating a robust comparison between these investor types. To accomplish this, researchers might consider several strategies, such as extending the recruitment period to allow for a wider reach and engagement with potential participants. Strategic sampling could also be employed, where researchers deliberately seek out and recruit a predetermined number of BAs and VCs to ensure balanced representation. A sample size of BAs and VCs with a more balanced distribution would enable a more nuanced examination and comparison of their respective decision-making processes and criteria, potentially uncovering distinct strategic priorities and approaches within the Swedish life science ecosystem.



Exploring the temporal dynamics of decision-making criteria also presents a future area for research. A longitudinal study could investigate how the prioritisation of investment criteria evolves, including any trade-offs that occur as life science ventures progress through different stages of their lifecycle. Such an analysis could reveal how BAs and VCs adapt their strategies to changes in the venture's development, market conditions, or regulatory environment.

Extending the scope of research to include comparisons between the life science sector and other industries, such as information technology and software, could uncover industry-specific decision-making frameworks. This comparative analysis might highlight unique challenges and criteria relevant to different sectors, offering broader insights into the investment landscape across Sweden's diverse economic sectors.

Furthermore, a topic that warrants further exploration is the influence of capital size on investor attitudes and decision-making criteria. This study hints at the potential impact that the magnitude of available capital, whether from small-scale individual investors or large institutional funds, may have on investment strategies and preferences. Future research could delve into how the scale of capital influences the risk assessment, sector focus, and partnership expectations of BAs and VCs in life sciences. Such an investigation could shed light on whether and how the financial capacity of investors shapes their approach to navigating the complexities and opportunities of the life science investment landscape.

Lastly, addressing information asymmetry between investors and ventures during the pre-investment and investment stages could enrich the understanding of strategic interactions and trust-building mechanisms in the investment process. Investigating these aspects would contribute to a deeper comprehension of how BAs and VCs mitigate risks and align expectations with potential life science ventures, thereby strengthening the overall investment ecosystem in Sweden.

By exploring these directions, future research can build on the findings of this study to offer more detailed strategies for BAs and VCs, further contributing to the growth and innovation of Sweden's life science sector and beyond.

## Appendix 1: Semi-Structured Interview Schedule

### Investor's Background

- How long have you been involved in venture capital or angel investing in the life sciences sector?
- Have there been particular experiences or events that had a significant impact on your investment decisions?

### Investment Evaluation

- In your opinion, what are the standout attributes of successful life science startups that positively influence investment decisions?
  - How crucial is it for a startup's vision to align with yours?
  - How do you assess a startup's technology or solution?
  - What role does the management team play in your evaluations?
  - Are there financial indicators that you particularly emphasize in your decision-making?
- Have there been instances where a startup's post-investment actions didn't match your initial expectations?
  - What strategies or measures have you employed in such situations?

### Networks and Collaborations

- In your opinion, how do your local or international connections enhance your understanding or evaluation of startups?
  - Can you recall an instance where your networks significantly influenced an investment decision?
  - How consistent are you in partnering with specific actors?
  - Do you find multiple investors provide a more comprehensive view of startups?

### Challenges and Barriers

- What are the primary challenges you face when contemplating investments in Sweden’s life science startups?
  - How does the Swedish innovation ecosystem influence your decisions?
  - How do you establish and maintain trust with startups?
  - Can you pinpoint any sector-specific regulatory or market challenges?
  - What methods or strategies do you use to overcome these challenges?

### **Geographical Implications**

- Does the geographical location of startups influence your investment decisions, in your opinion?
  - Are there particular strategies you use when engaging with international or cross-border startups?
  - Do startups from different regions present distinct challenges or opportunities?

### **Future Perspectives and Sector-Specific Insights**

- Considering the evolving nature of the life science sector, how do you anticipate changes in your investment criteria in the coming years?
  - Are there potential challenges you foresee in maintaining robust partnerships with startups?
  - How might you adapt to these challenges?
- What advice or insights might you offer to life science startups in Sweden aiming to attract VC or BA investments?
  - Do you have any specific recommendations for actors in the Swedish innovation ecosystem, like KI Innovations, to increase the appeal of the companies they support?

## Appendix 2: Additional Quotes

**Table 3: Additional Quotes to Support the Findings in Chapter 4**

Decision-Making Criteria	Participant	Quote
Risk Appetite	VC1	<i>"You have to remember that, but what we invest in is really high risk programs."</i>
Risk Appetite	VC5	<i>"For us, it's about whether they are in drug development and the opportunities they are targeting a novel target, which is either not known or they have a different type of approach. It's, of course, more risky, but you know, with more risk comes more of a return perspective. That's what we are kind of more interested in, those interesting scientific approaches."</i>
Risk Appetite	VC1	<i>"We have a portfolio of 10 startups. I would argue that two of these companies will be really, extremely successful. Two or three will be complete failures, and the others will be OK, you know. They will bring a product to market, they will be reasonably successful, and then you take the totality of that, and that should give you a multiple of two or three on a portfolio basis. But then, when you invest, every time we invest in a company, we need to see that there is a potential value in each and every single investment that has the potential of giving us 5 to 10 times the money."</i>
Science and Technology Evaluation	VC6	<i>"Once in a while, something will come out of, you know, a small village somewhere, but it's unlikely because they probably don't have the labs and the funding for the kind of initial research where a lot of it comes from. Quite a few of our portfolio companies have their drugs as spinouts from [a Crown Research Organisation] and [the Government Accountability Office] or from some big pharma companies as well. So, it'll usually come from a place where there is a lot of innovation happening."</i>
Networking	BA3	<i>"Locally, it's great. I mean, they lower the risks from various resources locally. Like, if [VC firm] takes an investment, they do the due diligence and they take care of the technical aspects. Do they ensure that the company is soundly managed? You have [innovation hub] that takes care of a lot of lowering of the risks by getting the entrepreneurs to a certain level, and so on and so on."</i>
Adaptability	VC4	<i>"Us and quite a few other investors I've talked to are trying to understand the digital space. Unlike typical VC companies, many of us don't have much experience with digital solutions, AI, and machine learning. In traditional pharma cases, we understand the inflection points and how it works. The same goes for MedTech, we know what to expect. But with these digital companies, what should we expect? That's something we're curious about and want to learn. It's an area we hope to invest in more in the future, something we haven't done much yet."</i>
Vision Alignment	VC1	<i>"I would argue that sharing a vision is a crucial element, not just for the founder and management but for all investors who come on board. It's about aligning on the ambition, understanding where we're heading, and recognizing the journey we're undertaking together. This shared vision is vital, as ventures inevitably experience ups and downs. When challenges arise, and people become fearful, hesitating, or even contemplating abandoning the project, it can lead to disaster. Therefore, it's essential to maintain a long-term vision and ensure stability, even when setbacks occur, such as toxicity issues in animal studies or formulation problems."</i>
Ecosystem Influence	VC3	<i>"External expertise is far more expensive here. So, sometimes companies here look at the US market and see how much money the US companies are getting, but they don't understand that it's a completely different ecosystem here, both in terms of the amount of money and what things cost, for example. Also, the valuation and how much money they're taking."</i>
Regulatory Navigation	VC5	<i>"One issue in Sweden is the healthcare system. When working with regions and municipalities, it's not so difficult to get a pilot. However, when transitioning from a pilot to obtaining licenses or expanding the business, there's a challenging procurement process. Additionally, if you're a Swedish company, most investors also prefer to see prior success in Sweden before entering other markets."</i>

## References

- Arachchi, W., & Nimesha, T. (2022). Unlocking Finance through Social Networks: Attracting investment for the hightech Swedish startups in Luleå, Sweden. *Luleå University of Technology Department of Social Sciences, Technology and Art*.
- Arthurs, J. D., & Busenitz, L. W. (2003). The Boundaries and Limitations of Agency Theory and Stewardship Theory in the Venture Capitalist/Entrepreneur Relationship. *Entrepreneurship Theory and Practice*, 28(2), 145–162. <https://doi.org/10.1046/j.1540-6520.2003.00036.x>
- Arvidsson, P. I., Sandberg, K., & Forsberg-Nilsson, K. (2016). Open for collaboration: an academic platform for drug discovery and development at SciLifeLab. *Drug Discovery Today*, 21(10), 1690–1698. <https://doi.org/10.1016/j.drudis.2016.06.026>
- Avdeitchikova, S. (2008). On the structure of the informal venture capital market in Sweden: developing investment roles. *Venture Capital*, 10(1), 55–85. <https://doi.org/10.1080/13691060701605504>
- Baker, H. K., Kumar, S., & Pandey, N. (2020). A bibliometric analysis of European Financial Management's first 25 years. *European Financial Management*, 26(5), 1224–1260. <https://doi.org/10.1111/eufm.12286>
- Batjargal, B. (2005). Network Triads: Transitivity, Referral and Venture Capital Decisions in China and Russia. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.682545>
- Batjargal, B., & Liu, M. (Manhong). (2004). Entrepreneurs' Access to Private Equity in China: The Role of Social Capital. *Organization Science*, 15(2), 159–172. <https://doi.org/10.1287/orsc.1030.0044>
- Bengtson, A., Casales, B. M., & Lindholm, C. (2022). Becoming a public sector insider - A case study of Swedish digital healthcare start-ups' entrepreneurial business formation processes. *Industrial Marketing Management*, 105, 340–350. <https://doi.org/10.1016/j.indmarman.2022.06.013>
- Bergemann, D., & Hege, U. (1998). Venture capital financing, moral hazard, and learning. *Journal of Banking & Finance*, 22(6-8), 703–735. [https://doi.org/10.1016/s0378-4266\(98\)00017-x](https://doi.org/10.1016/s0378-4266(98)00017-x)
- Berglund, H. (2011). Early stage venture capital investing: comparing California and Scandinavia. *Venture Capital*, 13(2), 119–145. <https://doi.org/10.1080/13691066.2011.558366>
- Bergqvist, H. (2008). *A benchmarking study of the Swedish and British life science innovation systems: comparison of policies and funding*. VINNOVA - Swedish Governmental Agency for Innovation Systems.

- Bernstein, S., Korteweg, A., & Laws, K. (2017). Attracting Early-Stage Investors: Evidence from a Randomized Field Experiment. *The Journal of Finance*, 72(2), 509–538.  
<https://doi.org/10.1111/jofi.12470>
- Bessière, V., Stéphany, E., & Wirtz, P. (2019). Crowdfunding, business angels, and venture capital: an exploratory study of the concept of the funding trajectory. *Venture Capital*, 22(2), 1–26.  
<https://doi.org/10.1080/13691066.2019.1599188>
- Bilau, J., & Sarkar, S. (2015). Financing innovative start-ups in Portuguese context: what is the role of business angels networks? *Journal of the Knowledge Economy*, 7(4), 920–934.  
<https://doi.org/10.1007/s13132-015-0304-1>
- Black, B. S., & Gilson, R. J. (1996). Venture Capital and the Structure of Capital Markets: Banks Versus Stock Markets. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.46909>
- Blumenthal, D., Causino, N., Campbell, E., & Louis, K. S. (1996). Relationships between Academic Institutions and Industry in the Life Sciences — An Industry Survey. *New England Journal of Medicine*, 334(6), 368–374. <https://doi.org/10.1056/nejm199602083340606>
- Boddy, C. R. (2016). Sample size for qualitative research. *Qualitative Market Research: An International Journal*, 19(4), 426–432. <https://doi.org/10.1108/QMR-06-2016-0053>
- Bonini, S., & Capizzi, V. (2019). The role of venture capital in the emerging entrepreneurial finance ecosystem: future threats and opportunities. *Venture Capital*, 21(2-3), 137–175.
- Bonini, S., Capizzi, V., Valletta, M., & Zocchi, P. (2018). Angel network affiliation and business angels' investment practices. *Journal of Corporate Finance*, 50, 592–608.  
<https://doi.org/10.1016/j.jcorpfin.2017.12.029>
- Botelho, T., Harrison, R., & Mason, C. (2021). Business angel exits: a theory of planned behaviour perspective. *Small Business Economics*, 57, 583–602. <https://doi.org/10.1007/s11187-019-00292-0>
- Brander, J. A., Amit, R., & Antweiler, W. (2002). Venture-Capital Syndication: Improved Venture Selection vs. the Value-Added Hypothesis. *Journal of Economics & Management Strategy*, 11(3), 422–451. <https://doi.org/10.1162/105864002320272558>
- Braun, V., & Clarke, V. (2006). Using Thematic Analysis in Psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Braunerhjelm, P., & Svensson, R. (2009). The inventor's role: was Schumpeter right? *Journal of Evolutionary Economics*, 20(3), 413–444. <https://doi.org/10.1007/s00191-009-0157-5>
- Brush, C. G., Edelman, L. F., & Manolova, T. S. (2012). Ready for funding? Entrepreneurial ventures and the pursuit of angel financing. *Venture Capital*, 14(2-3), 111–129.  
<https://doi.org/10.1080/13691066.2012.654604>

- Bruton, G. D., Chahine, S., & Filatotchev, I. (2009). Founders, Private Equity Investors, and Underpricing in Entrepreneurial IPOs. *Entrepreneurship Theory and Practice*, 33(4), 909–928. <https://doi.org/10.1111/j.1540-6520.2009.00309.x>
- Bryman, A., Becker, S., & Sempik, J. (2008). Quality Criteria for Quantitative, Qualitative and Mixed Methods Research: A View from Social Policy. *International Journal of Social Research Methodology*, 11(4), 261–276.
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive Sampling: Complex or Simple? Research Case Examples. *Journal of Research in Nursing*, 25(8), 652–661. NCBI. <https://doi.org/10.1177/1744987120927206>
- Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, A. J. (2014). The use of triangulation in qualitative research. *Oncology Nursing Forum*, 41(5), 545–547. <https://doi.org/10.1188/14.ONF.545-547>
- Casamatta, C., & Haritchabalet, C. (2007). 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>
- Cegielska, E. (2020). LIMITATIONS ON THE ACTIVITY OF BUSINESS ANGELS IN FINANCING STARTUPS. *Acta Scientiarum Polonorum. Oeconomia*, 19(3), 5–12. <https://doi.org/10.22630/aspe.2020.19.3.23>
- Chatterji, A. K. (2009). Spawned with a silver spoon? Entrepreneurial performance and innovation in the medical device industry. *Strategic Management Journal*, 30(2), 185–206. <https://doi.org/10.1002/smj.729>
- Clough, D. R., Fang, T. P., Vissa, B., & Wu, A. (2019). Turning Lead into Gold: How Do Entrepreneurs Mobilize Resources to Exploit Opportunities? *Academy of Management Annals*, 13(1), 240–271. <https://doi.org/10.5465/annals.2016.0132>
- Collewaert, V., & Manigart, S. (2015). Valuation of Angel-Backed Companies: The Role of Investor Human Capital. *Journal of Small Business Management*, 54(1), 356–372. <https://doi.org/10.1111/jsbm.12150>
- Colombo, M. G., Montanaro, B., & Vismara, S. (2022). What drives the valuation of entrepreneurial ventures? A map to navigate the literature and research directions. *Small Business Economics*, 61, 59–84. <https://doi.org/10.1007/s11187-022-00688-5>
- Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling Theory: a Review and Assessment. *Journal of Management*, 37(1), 39–67.

- Conti, A., Thursby, M., & Rothaermel, F. T. (2010). SHOW ME WHAT YOU HAVE: SIGNALING, ANGEL AND VC INVESTMENTS IN TECHNOLOGY STARTUPS. *Academy of Management Proceedings*, 2010(1), 1–6.
- Conti, A., Thursby, M., & Rothaermel, F. T. (2013). Show Me the Right Stuff: Signals for High-Tech Startups. *Journal of Economics & Management Strategy*, 22(2), 341–364.  
<https://doi.org/10.1111/jems.12012>
- Croce, A., Tenca, F., & Ughetto, E. (2016). How business angel groups work: Rejection criteria in investment evaluation. *International Small Business Journal*, 35(4), 405–426.  
<https://doi.org/10.1177/0266242615622675>
- Cumming, D. J., & MacIntosh, J. G. (2003). Venture-Capital Exits in Canada and the United States. *The University of Toronto Law Journal*, 53(2), 101. <https://doi.org/10.2307/3650880>
- Dhochak, M., & Sharma, A. K. (2016). Identification and prioritization of factors affecting venture capitalists' investment decision-making process. *Journal of Small Business and Enterprise Development*, 23(4), 964–983. <https://doi.org/10.1108/jsbed-12-2015-0166>
- Diefenbach, T. (2008). Are case studies more than sophisticated storytelling?: Methodological problems of qualitative empirical research mainly based on semi-structured interviews. *Quality & Quantity*, 43(6), 875–894. <https://doi.org/10.1007/s11135-008-9164-0>
- Dubini, P. (1989). Which venture capital backed entrepreneurs have the best chances of succeeding? *Journal of Business Venturing*, 4(2), 123–132. [https://doi.org/10.1016/0883-9026\(89\)90026-8](https://doi.org/10.1016/0883-9026(89)90026-8)
- Dutta, S., & Folta, T. B. (2016). A comparison of the effect of angels and venture capitalists on innovation and value creation. *Journal of Business Venturing*, 31(1), 39–54.  
<https://doi.org/10.1016/j.jbusvent.2015.08.003>
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14(1), 57–74.
- Ejerimo, O., & Kander, A. (2011). Swedish business research productivity. *Industrial and Corporate Change*, 20(4), 1081–1118. <https://doi.org/10.1093/icc/dtr023>
- Etikan, I. (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4. <https://doi.org/10.11648/j.ajtas.20160501.11>
- Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from National Systems and “Mode 2” to a Triple Helix of university–industry–government relations. *Research Policy*, 29(2), 109–123. [https://doi.org/10.1016/S0048-7333\(99\)00055-4](https://doi.org/10.1016/S0048-7333(99)00055-4)



- Fairchild, R. (2004). Financial Contracting Between Managers and Venture Capitalists: The Role of ValueAdded Services, Reputation Seeking, and Bargaining Power. *The Journal of Financial Research*, 27(4), 481–495. <https://doi.org/10.1111/j.14756803.2004.00104.x>
- Falk, E., Persson, J., & Stenström, K. (2023). *Statistics on Swedish life science companies*. VINNOVA. <https://www.vinnova.se/globalassets/mikrosajter/hallbar-precisionshalsa/life-science-a4-0326-bilaga-1-230414.pdf>
- Farhana, M., & Swietlicki, D. (2020). Dynamic Capabilities Impact on Innovation: Niche Market and Startups. *Journal of Technology Management & Innovation*, 15(3), 83–96. <https://doi.org/10.4067/s0718-27242020000300083>
- Félix, E. G. S., Pires, C. P., & Gulamhussen, M. A. (2012). The exit decision in the European venture capital market. *Quantitative Finance*, 14(6), 1115–1130. <https://doi.org/10.1080/14697688.2012.714903>
- Forbes, D. P. (2005). Are some entrepreneurs more overconfident than others? *Journal of Business Venturing*, 20(5), 623–640. <https://doi.org/10.1016/j.jbusvent.2004.05.001>
- Frias, K. M., Popovich, D. L., Duhan, D. F., & Lusch, R. F. (2020). Perceived Market Risk in New Ventures: A Study of Early-Phase Business Angel Investment Screening. *Journal of Macromarketing*, 40(3), 339–354. <https://doi.org/10.1177/0276146720926637>
- Fusch, P., & Ness, L. (2015). Are We There Yet? Data Saturation in Qualitative Research. *Walden Faculty and Staff Publications*, 20(9), 1408–1416. <https://scholarworks.waldenu.edu/facpubs/455/>
- Galletta, A. (2013). *Mastering the semistructured interview and beyond: From research design to analysis and publication* (Vol. 18). NYU press.
- Gentles, S. J., Charles, C., Ploeg, J., & Ann, M. K. (2015). Sampling in qualitative research: Insights from an overview of the methods literature. *The Qualitative Report*, 20(11), 1772–1789.
- Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report*, 8(4), 597–607.
- Gompers, P. A. (1995). 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>
- Gompers, P. A., & Lerner, J. (2004). *The venture capital cycle* (2nd ed., pp. 33–64). MIT press.
- Gompers, P., & Lerner, J. (2001). The Venture Capital Revolution. *Journal of Economic Perspectives*, 15(2), 145–168. <https://doi.org/10.1257/jep.15.2.145>
- Gornall, W., & Strebulaev, I. A. (2015). The Economic Impact of Venture Capital: Evidence from Public Companies. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2681841>

- Granz, C. (2021). How do bank-affiliated venture capitalists do deals? Towards a model of multiple investment logics. *Qualitative Research in Financial Markets*, 13(4), 440–481.  
<https://doi.org/10.1108/qrfm-07-2020-0137>
- Gregersen, B., & Pålsson, C. M. (2011). Biotechnology in Denmark and Sweden. In B. Göransson & C. M. Pålsson (Eds.), *Biotechnology and Innovation Systems*. Edward Elgar Publishing.  
<https://doi.org/10.4337/9781781001424>
- Guenther, C., Özcan, S., & Sassmannshausen, D. (2022). Referrals among VCs and the length of due diligence: The effect of relational embeddedness. *Journal of Business Venturing*, 37(5), 106230. <https://doi.org/10.1016/j.jbusvent.2022.106230>
- Gullander, S., & Napier, G. (2003). *Handbook in Business Angel Networks - the Nordic Case*. Stockholm School of Entrepreneurship.
- Hall, B. H., & Lerner, J. (2010). The financing of R&D and innovation. In *Handbook of the Economics of Innovation* (Vol. 1, pp. 609–639). Elsevier.
- Harrison, R. T., & Mason, C. M. (2000). Venture capital market complementarities: The links between business angels and venture capital funds in the United Kingdom. *Venture Capital*, 2(3), 223–242. <https://doi.org/10.1080/13691060050135091>
- Hearn, J., Nordberg, M., Andersson, K., Balkmar, D., Gottzén, L., Klinth, R., Pringle, K., & Sandberg, L. (2012). Hegemonic Masculinity and Beyond. *Men and Masculinities*, 15(1), 31–55.  
<https://doi.org/10.1177/1097184x11432113>
- Hellmann, T., Lindsey, L., & Puri, M. (2007). Building Relationships Early: Banks in Venture Capital. *Review of Financial Studies*, 21(2), 513–541. <https://doi.org/10.1093/rfs/hhm080>
- Hellmann, T., & Puri, M. (2002). Venture Capital and the Professionalization of Start-Up Firms: Empirical Evidence. *The Journal of Finance*, 57(1), 169–197. <https://doi.org/10.1111/1540-6261.00419>
- Herrmann, J., Avdeitchikova, S., & Hjertström, A. (2016). The influence of functional and relational proximity on business angel investments. *International Journal of Entrepreneurship and Small Business*, 29(3), 468. <https://doi.org/10.1504/ijesb.2016.079424>
- Hochberg, Y. V., Ljungqvist, A., & Lu, Y. (2007). Whom You Know Matters: Venture Capital Networks and Investment Performance. *The Journal of Finance*, 62(1), 251–301.  
<https://doi.org/10.1111/j.1540-6261.2007.01207.x>
- Hyytinen, A., & Pajarinen, M. (2001). *Financial systems and venture capital in Nordic countries: A comparative study* (No. 774). The Research Institute of the Finnish Economy (ETLA).  
<http://hdl.handle.net/10419/63771>

- Isaksson, A., Cornelius, B., Landström, H., & Junghagen, S. (2004). Institutional theory and contracting in venture capital: the Swedish experience. *Venture Capital, 6*(1), 47–71. <https://doi.org/10.1080/1369106042000175582>
- Jacob, M., Lundqvist, M., & Hellsmark, H. (2003). Entrepreneurial transformations in the Swedish University system: the case of Chalmers University of Technology. *Research Policy, 32*(9), 1555–1568. [https://doi.org/10.1016/s0048-7333\(03\)00024-6](https://doi.org/10.1016/s0048-7333(03)00024-6)
- Jehan, S. N. (2021). Due Diligence and Risk Alleviation in Innovative Ventures—An Alternative Investment Model from Islamic Finance. *Journal of Risk and Financial Management, 14*(6), 276. <https://doi.org/10.3390/jrfm14060276>
- Johnson, P., Buehring, A., Cassell, C., & Symon, G. (2006). Evaluating qualitative management research: Towards a contingent criteriology. *International Journal of Management Reviews, 8*(3), 131–156. <https://doi.org/10.1111/j.1468-2370.2006.00124.x>
- Johnson, W. C., & Sohl, J. (2012). Angels and venture capitalists in the initial public offering market. *Venture Capital, 14*(1), 27–42. <https://doi.org/10.1080/13691066.2012.660743>
- Kaplan, S. N., & Schoar, A. (2005). 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>
- Kaplan, S. N., & Stromberg, P. (2003). Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts. *Review of Economic Studies, 70*(2), 281–315. <https://doi.org/10.1111/1467-937x.00245>
- Karaarslan, M. H., Bayar, Y., & Ozdeveci, C. (2016). Post-Investment Contributions of Business Angels from the Investee Perspective in Turkey. *International Journal of Business Administration, 7*(3). <https://doi.org/10.5430/ijba.v7n3p44>
- Karsai, J., Wright, M., Dudzinski, Z., & Morovic, J. (1998). Screening and valuing venture capital investments: evidence from Hungary, Poland and Slovakia. *Entrepreneurship & Regional Development, 10*(3), 203–224. <https://doi.org/10.1080/08985629800000012>
- Kelly, P., & Hay, M. (2003). Business angel contracts: the influence of context. *Venture Capital, 5*(4), 287–312. <https://doi.org/10.1080/1369106032000141940>
- Klačmer Čalopa, M., Horvat, J., & Lalić, M. (2014). Analysis of financing sources for start-up companies. *Management : Journal of Contemporary Management Issues, 19*(2), 19–44. <https://hrcak.srce.hr/clanak/196722>
- Kleyn, D., Kitney, R., & Atun, R. A. (2007). Partnership And Innovation In The Life Sciences. *International Journal of Innovation Management, 11*(02), 323–347. <https://doi.org/10.1142/s1363919607001722>

- Kollmann, T., & Kuckertz, A. (2010). Evaluation uncertainty of venture capitalists' investment criteria. *Journal of Business Research*, 63(7), 741–747. <https://doi.org/10.1016/j.jbusres.2009.06.004>
- Kortum, S., & Lerner, J. (2000). Assessing the Contribution of Venture Capital to Innovation. *The RAND Journal of Economics*, 31(4), 674. <https://doi.org/10.2307/2696354>
- Koskinen, Y., Rebello, M. J., & Wang, J. (2011). Private Information and Bargaining Power in Venture Capital Financing. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.891192>
- KPMG. (2021). *Total value of deals in the life sciences industry worldwide from 2013 to 2021(in billion U.S. dollars)*. Statista. <https://www.statista.com/statistics/398216/total-value-of-global-deals-in-chemical-pharmaceutical-industry/>
- Kulkov, I., Berggren, B., Eriksson, K., Hellström, M., & Wikstrom, K. (2020). The importance of financial resources and ownership of intellectual property rights for university spinoffs: the cases of Finland and Sweden. *Journal of Small Business and Enterprise Development*, 27(7), 1125–1147. <https://doi.org/10.1108/JSBED0920190308>
- Landstrom, H. (1993). Agency Theory and Its Application to Small Firms: Evidence from the Swedish Venture Capital Market. *The Journal of Entrepreneurial Finance*, 2(3), 203–218. <https://doi.org/10.57229/2373-1761.1136>
- Langaas, M., & Mujtaba, B. G. (2023). Communication across Cultures in the Workplace: Swimming in Scandinavian Waters. *Open Journal of Social Sciences*, 11(4), 174–192. <https://doi.org/10.4236/jss.2023.114014>
- Lerner, J. (1994). Venture capitalists and the decision to go public. *Journal of Financial Economics*, 35(3), 293–316. [https://doi.org/10.1016/0304-405x\(94\)90035-3](https://doi.org/10.1016/0304-405x(94)90035-3)
- Lerner, J. (2012). *The architecture of innovation: The economics of creative organizations*. Harvard Business Press.
- Lindgaard Christensen, J. (2011). Should government support business angel networks? The tale of Danish business angels network. *Venture Capital*, 13(4), 337–356. <https://doi.org/10.1080/13691066.2011.642513>
- Lindsey, L. (2008). Blurring Firm Boundaries: The Role of Venture Capital in Strategic Alliances. *The Journal of Finance*, 63(3), 1137–1168. <https://doi.org/10.1111/j.1540-6261.2008.01354.x>
- Lumivero. (2023). *NVivo*. Lumivero; lumivero. <https://lumivero.com/products/nvivo/>
- Malmgren, R. D., Ottino, J. M., & Amaral, L. A. N. (2010). The role of mentorship in protégé performance. *Nature*, 465(7298), 622–626. <https://doi.org/10.1038/nature09040>
- Mason, C. M. (2008). The real venture capitalists: a review of research on business angels. *Hunter Center for Entrepreneurship*, 1–55.

- Mason, C. M., & Harrison, R. T. (2002). Is it worth it? The rates of return from informal venture capital investments. *Journal of Business Venturing*, *17*(3), 211–236.  
[https://doi.org/10.1016/s0883-9026\(00\)00060-4](https://doi.org/10.1016/s0883-9026(00)00060-4)
- Mason, C. M., & Harrison, R. T. (2015). Business Angel Investment Activity in the Financial Crisis: UK Evidence and Policy Implications. *Environment and Planning C: Government and Policy*, *33*(1), 43–60. <https://doi.org/10.1068/c12324b>
- Mason, C., Botelho, T., & Harrison, R. (2019). The changing nature of angel investing: some research implications. *Venture Capital*, *21*(2-3), 177–194.  
<https://doi.org/10.1080/13691066.2019.1612921>
- Mason, C., Botelho, T., & Zygmunt, J. (2016). Why business angels reject investment opportunities: Is it personal? *International Small Business Journal: Researching Entrepreneurship*, *35*(5), 519–534. <https://doi.org/10.1177/0266242616646622>
- Mason, C., Harrison, R., & Botelho, T. (2015). Business angel exits: strategies and processes. *International Research Handbook on Entrepreneurial Finance*, 102–1124.
- Mayer, C., Schoors, K., & Yafeh, Y. (2005). Sources of funds and investment activities of venture capital funds: evidence from Germany, Israel, Japan and the United Kingdom. *Journal of Corporate Finance*, *11*(3), 586–608. <https://doi.org/10.1016/j.jcorpfin.2004.02.003>
- Meckling, W. H., & Jensen, M. C. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360.
- Metrick, A., & Yasuda, A. (2021). *Venture capital and the finance of innovation*. John Wiley & Sons.
- Meyer, J. W., & Rowan, B. (1977). Institutionalized Organizations: Formal Structure as Myth and Ceremony. *American Journal of Sociology*, *83*(2), 340–363. <https://doi.org/10.1086/226550>
- Michaeli, D. T., Yagmur, H. B., Achmadeev, T., & Michaeli, T. (2022). Valuation and Returns of Drug Development Companies: Lessons for Bioentrepreneurs and Investors. *Therapeutic Innovation & Regulatory Science*, *56*(2), 313–322. <https://doi.org/10.1007/s43441-021-00364-y>
- Ministry of Enterprise and Innovation. (2020). *Sweden's national life sciences strategy*.  
<https://www.government.se/information-material/2020/11/swedens-national-life-sciences-strategy/>
- Mittleness, C. R., Baucus, M. S., & Sudek, R. (2012). Horse vs. Jockey? How stage of funding process and industry experience affect the evaluations of angel investors. *Venture Capital*, *14*(4), 241–267. <https://doi.org/10.1080/13691066.2012.689474>
- Moberg, D. J. (2007). Practical Wisdom and Business Ethics. *Business Ethics Quarterly*, *17*(03), 535–561. <https://doi.org/10.5840/beq200717336>

- Mohammadi, A., Shafizadeh, M., & Johan, S. (2014). A signaling theory of entrepreneurial Venture's valuation: Evidence from early termination of venture capital investment. *Stockholm Royal Institute of Technology, CESIS-Centre of Excellence for Science and Innovation Studies: Stockholm, Sweden.*
- Nauwelaers, C., Maguire, K., & Giulia Ajmone Marsan. (2013). *The Case of Oresund (Denmark-Sweden) – Regions and Innovation: Collaborating Across Borders.*  
<https://doi.org/10.1787/5k3xv0lk8knn-en>
- Osnabrugge, V. (2000). A comparison of business angel and venture capitalist investment procedures: an agency theorybased analysis. *Venture Capital: An International Journal of Entrepreneurial Finance*, 2(2), 91–109.
- Paul, S., Whittam, G., & Johnston, J. B. (2003). The operation of the informal venture capital market in Scotland. *Venture Capital*, 5(4), 313–335. <https://doi.org/10.1080/1369106032000141931>
- Payne, G. T., Davis, J. L., Moore, C. B., & Bell, R. G. (2009). The Deal Structuring Stage of the Venture Capitalist Decision-Making Process: Exploring Confidence and Control. *Journal of Small Business Management*, 47(2), 154–179. <https://doi.org/10.1111/j.1540-627x.2009.00266.x>
- Plummer, L. A., Allison, T. H., & Connelly, B. L. (2016). Better Together? Signaling Interactions in New Venture Pursuit of Initial External Capital. *Academy of Management Journal*, 59(5), 1585–1604. <https://doi.org/10.5465/amj.2013.0100>
- Powell, W. W., & DiMaggio, P. J. (2012). *The new institutionalism in organizational analysis.* University of Chicago press.
- Powell, W. W., White, D. R., Koput, K. W., & Owen-Smith, J. (2005). Network Dynamics and Field Evolution: The Growth of Interorganizational Collaboration in the Life Sciences. *American Journal of Sociology*, 110(4), 1132–1205. <https://doi.org/10.1086/421508>
- Prastyaningtyas, E. W., Sutrisno, S., Soeprajitno, E. D., Ausat, A. M. A., Ausat, A. M. A., & Suherlan, S. (2023). Analysing the Role of Mentors in Entrepreneurship Education: Effective Support and Assistance. *Journal on Education*, 5(4), 14571–14577.  
<https://doi.org/10.31004/joe.v5i4.2511>
- Proimos, A., & Wright, S. (2005). A pilot study of venture capital investment appraisal in Australia. *Journal of Financial Services Marketing*, 9(3), 272–286.  
<https://doi.org/10.1057/palgrave.fsm.4770159>
- Puri, M., & Zarutskie, R. (2012). On the Life Cycle Dynamics of Venture-Capital- and Non-Venture-Capital-Financed Firms. *The Journal of Finance*, 67(6), 2247–2293.  
<https://doi.org/10.1111/j.1540-6261.2012.01786.x>

- Rehman, A., Jingdong, L., Khatoon, R., & Hussain, I. (2017). Modern Agricultural Technology Adoption its importance, Role and Usage for the Improvement of Agriculture. *Life Science Journal*, 14(2), 70–74. <https://doi.org/10.7537/marslsj140217.10>
- Reid, A., & Gough, S. (2000). Guidelines for Reporting and Evaluating Qualitative Research: What are the alternatives? *Environmental Education Research*, 6(1), 59–91. <https://doi.org/10.1080/135046200110494>
- Rencher, M. (2012). *Crossing the Valley of Death: A Multisited, multilevel ethnographic study of growth startups and entrepreneurial communities in postindustrial Detroit*. Wayne State University.
- Rin, D., & Phalippou, L. (2017). The importance of size in private equity: Evidence from a survey of limited partners. *Journal of Financial Intermediation*, 31, 64–76. <https://doi.org/10.1016/j.jfi.2016.07.001>
- Robinson, K. C., & Phillips McDougall, P. (2001). Entry barriers and new venture performance: a comparison of universal and contingency approaches. *Strategic Management Journal*, 22(6-7), 659–685. <https://doi.org/10.1002/smj.186>
- Sahlman, W. A. (1990). The structure and governance of venture-capital organizations. *Journal of Financial Economics*, 27(2), 473–521. [https://doi.org/10.1016/0304-405x\(90\)90065-8](https://doi.org/10.1016/0304-405x(90)90065-8)
- Salamzadeh, A., & Kawamorita Kesim, H. (2015). *Startup Companies: Life Cycle and Challenges*. Papers.ssrn.com. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2628861](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2628861)
- Sandelowski, M. (1995). Sample size in qualitative research. *Research in Nursing & Health*, 18(2), 179–183. <https://doi.org/10.1002/nur.4770180211>
- Sandström, A. (2014). *Global Trends with Local Effects: The Swedish Life Science Industry*. VINNOVA. [https://www.vinnova.se/contentassets/794475dd7a8f45349a146382f598d2fa/va\\_14\\_03.pdf](https://www.vinnova.se/contentassets/794475dd7a8f45349a146382f598d2fa/va_14_03.pdf)
- Shane, S. (2012). The Importance of Angel Investing in Financing the Growth of Entrepreneurial Ventures. *Quarterly Journal of Finance*, 02(02), 1250009. <https://doi.org/10.1142/s2010139212500097>
- Silver, L., Berggren, B., & Fili, A. (2016). The role of crowdfunding in entrepreneurial ventures: an analysis of recent trends in Sweden. *Investment Management and Financial Innovations*, 13(1), 221–229. [https://doi.org/10.21511/imfi.13\(1-1\).2016.09](https://doi.org/10.21511/imfi.13(1-1).2016.09)
- Smith, G. (2001). How Early Stage Entrepreneurs Evaluate Venture Capitalists. *The Journal of Private Equity*, 4(2), 33–45. <https://doi.org/10.3905/jpe.2001.319981>
- Söderblom, A. (2012). The Current State of the Venture Capital Industry in Relation to Other Financing Sources for Startup Firms. *Entreprenörskapsforum*.

- [https://entreprenorskapsforum.se/wp-content/uploads/2012/01/Rapport\\_Current-state-of-the-venture\\_webb.pdf](https://entreprenorskapsforum.se/wp-content/uploads/2012/01/Rapport_Current-state-of-the-venture_webb.pdf)
- Soenksen, L. R., & Yazdi, Y. (2017). Stage-gate process for life sciences and medical innovation investment. *Technovation*, 62-63, 14–21.  
<https://doi.org/10.1016/j.technovation.2017.03.003>
- Sørensen, M. (2007). How Smart Is Smart Money? A Two-Sided Matching Model of Venture Capital. *The Journal of Finance*, 62(6), 2725–2762. <https://doi.org/10.1111/j.1540-6261.2007.01291.x>
- Sørheim, R. (2005). Business angels as facilitators for further finance: an exploratory study. *Journal of Small Business and Enterprise Development*, 12(2), 178–191.  
<https://doi.org/10.1108/14626000510594593>
- Sort, J. C., & Nielsen, C. (2018). Using the business model canvas to improve investment processes. *Journal of Research in Marketing and Entrepreneurship*, 20(1), 10–33.  
<https://doi.org/10.1108/jrme-11-2016-0048>
- Spence, M. (1973). Job Market Signaling. *The Quarterly Journal of Economics*, 87(3), 355–374.
- Spence, M. (2002). Signaling in Retrospect and the Informational Structure of Markets. *American Economic Review*, 92(3), 434–459. <https://doi.org/10.1257/00028280260136200>
- Styhre, A. (2017). Unified economic ideas and their hybrid policies: the case of Swedish life science innovation work. *Technology Analysis & Strategic Management*, 30(1), 31–43.  
<https://doi.org/10.1080/09537325.2017.1279279>
- Act on the Right in Employee Inventions, 3 (1949). [https://www.riksdagen.se/sv/dokument-och-lagar/dokument/svensk-forfattningssamling/lag-1949345-om-ratten-till-arbetstagares\\_sfs-1949-345/](https://www.riksdagen.se/sv/dokument-och-lagar/dokument/svensk-forfattningssamling/lag-1949345-om-ratten-till-arbetstagares_sfs-1949-345/)
- Swedish Agency for Growth Policy Analysis. (2018). *Growth in Sweden's life science industry 2014–16*. <https://www.tillvaxtanalys.se/in-english/publications/pm/pm/2018-04-06-growth-in-swedens-life-science-industry-2014-16.html>
- Tetsuya Kirihata. (2022). Contribution of business angel investments: evidence from Estonia. *Journal of Capital Markets Studies*, 6(3), 287–303. <https://doi.org/10.1108/jcms-08-2022-0033>
- Tykvová, T. (2003). *The decision of venture capitalists on timing and extent of IPOs* (ZEW Discussion Papers No. 03-12). Zentrum für Europäische Wirtschaftsforschung (ZEW).  
<http://hdl.handle.net/10419/24815>
- Ueda, M. (2004). Banks versus Venture Capital: Project Evaluation, Screening, and Expropriation. *The Journal of Finance*, 59(2), 601–621. <https://doi.org/10.1111/j.1540-6261.2004.00643.x>



- Valliere, D., & Peterson, R. (2007). When entrepreneurs choose VCs: Experience, choice criteria and introspection accuracy. *Venture Capital, 9*(4), 285–309.  
<https://doi.org/10.1080/13691060701605413>
- Westlund, H., Larsson, J. P., & Olsson, A. R. (2014). Start-ups and Local Entrepreneurial Social Capital in the Municipalities of Sweden. *Regional Studies, 48*(6), 974–994.  
<https://doi.org/10.1080/00343404.2013.865836>
- White, B. A., & Dumay, J. (2018). The angel investment decision: insights from Australian business angels. *Accounting & Finance, 60*(3), 3133–3162. <https://doi.org/10.1111/acfi.12427>
- Wiencke, E. (2017). Value contributions of the venture capitalist in Mexico: building an exit for the investment. *Journal of Technology Management & Innovation, 12*(3), 22–33.  
<https://doi.org/10.4067/s0718-27242017000300003>
- Wiltbank, R. (2005). Investment practices and outcomes of informal venture investors. *Venture Capital, 7*(4), 343–357. <https://doi.org/10.1080/13691060500348876>
- Wisuttisak, P. (2021). Comparative Study on Regulatory Frameworks for Promotion of Startup Businesses and SMEs in Japan, Republic of Korea, Malaysia, and Thailand. *World Scientific Series in Finance, 3*–32. [https://doi.org/10.1142/9789811235825\\_0001](https://doi.org/10.1142/9789811235825_0001)
- World Bank Group. (2015). *Sweden's Business Climate: A Microeconomic Assessment*.  
<https://www.enterprisesurveys.org/content/dam/enterprisesurveys/documents/reports/sweden/Sweden-Business-Climate-2015.pdf>
- Yang, H., Shi, H., Wu, Y. J., Zhang, L., & Xie, S. (2021). Entrepreneurial Passion and Venture Capitalists' Willingness to Invest: The Role of Relational Capital. *Frontiers in Psychology, 12*.  
<https://doi.org/10.3389/fpsyg.2021.728589>
- Yang, S., Gao, K., Tang, H., & Zhang, R. (2018). Impact of Venture Capital in Strategic Emerging Industries on Enterprise Technological Innovation - Based on GEM. *Proceedings of the 4th Annual International Conference on Management, Economics and Social Development (ICMESD 2018)*, 218–222. <https://doi.org/10.2991/icmesd18.2018.36>
- Yung, C. (2012). Venture Capital Before The First Dollar: Deal Origination, Screening, and Evaluation. In *The Oxford Handbook of Venture Capital* (pp. 303–327). Oxford University Press.  
<https://doi.org/10.1093/oxfordhb/9780195391596.013.0010>
- Zacharakis, A. L., McMullen, J. S., & Shepherd, D. A. (2007). Venture capitalists' decision policies across three countries: an institutional theory perspective. *Journal of International Business Studies, 38*(5), 691–708. <https://doi.org/10.1057/palgrave.jibs.8400291>
- Zacharakis, A., & Shepherd, D. A. (2007). The preinvestment process: Venture capitalists' decision policies. *Handbook of Research on Venture Capital, 1*, 177.

- Zeilon, L., & Lindén, L. (2022). *Internationalization of Life Science Startups The Case of Swedish Life Science Businesses (Dissertation)*. <https://urn.kb.se/resolve?urn=urn:nbn:se:lnu:diva-114598>
- Zhang, L., & Zhang, X. (2021). The foreign experience and investment performance of venture capitalists. *Accounting & Finance*. <https://doi.org/10.1111/acfi.12836>
- Zhao, E. Y., Fisher, G., Lounsbury, M., & Miller, D. (2016). Optimal distinctiveness: Broadening the interface between institutional theory and strategic management. *Strategic Management Journal*, 38(1), 93–113. <https://doi.org/10.1002/smj.2589>
- Zucker, L. G. (1987). Institutional Theories of Organization. *Annual Review of Sociology*, 13(1), 443–464. <https://doi.org/10.1146/annurev.so.13.080187.002303>