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**Essays on High-Growth Entrepreneurial Firms: Evidence from Unicorn Ventures**

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## **ABSTRACT**

### **Essays on High-Growth Entrepreneurial Firms: Evidence from Unicorn Ventures**

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Previous management, finance, and entrepreneurship theories have paid less attention to unicorn ventures. The recent studies only provide an incomplete understanding of unicorn ventures as they do not systematically explain how they are different from the existing established firms or smaller nascent ventures. This dissertation explores the unicorn ventures' unique distinctiveness in terms of media legitimization, resource acquisition, and venture growth and scaling. To do so, I summarize the previous literature on the phenomenon of unicorn ventures. I suggest exploratory research on unicorn ventures to understand the factors influencing scaling speed to unicorn venture status. Also, I examine unicorn ventures' financial resource acquisition at Initial Public Offering, comparing unicorn ventures with non-unicorn ventures going public in the North American stock exchanges between 2011 and 2018. I suggest that unicorn ventures experience a greater underpricing than other firms because of media uncertainty stemming from the high expectations surrounding the venture's future performance.

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아니하시는 하나님께 구하라 그리하면 주시리라 (야고보서 1:5)

## 1. INTRODUCTION

“Like their mythical namesakes, unicorn ventures are surrounded by a glow of mystery and magic. Yet beyond the hype, do we really know what makes these billion-dollar startups so unique?”

- Ilya Strabulaev, Finance Professor, Stanford Graduate School of Business

### 1.1. Overview

As the quote above from Ilya Strabulaev – a professor of finance at Stanford Graduate School of Business, indicates unicorn ventures have recently emerged as representative entrepreneurial entities. This category of high-growth entrepreneurial ventures has become a source of inspiration and a new role model for entrepreneurs and corporate managers. Unicorn ventures significantly impact the business landscape as they attempt to exploit unique market and technological opportunities, scale rapidly, and come to create and exemplify new industries and market categories. They represent a small, though high-profile, category of entrepreneurial ventures that captures significant media attention and garners entrepreneurs’ and analysts’ interest while attracting substantial amounts of financial capital.

Despite their potential to attract resources, academic research has paid scant attention to this interesting entrepreneurial phenomenon. This lack of scholarly attention is not surprising, given that valuations exceeding a billion dollars for private entrepreneurial ventures are a recent phenomenon, and the unicorn label is even more recent. While unicorn ventures garner considerable financial resources, we know little about what issues entrepreneurship-focused researchers consider important when examining such ventures.

Past studies have identified three streams of theoretical mechanisms to understand how entrepreneurial ventures acquire resources amidst significant uncertainty. First, studies have addressed how early-stage ventures focus on legitimacy by aligning the company with investors' expectations (Lounsbury and Glynn, 2001; Navis and Glynn, 2011, 2017). Second, studies have investigated how network ties with professional exchange partners explain differences in how new ventures acquire resources (Hallen, 2008; Hallen and Eisenhardt, 2012; Hallen and Pahnke, 2016). Third, studies have addressed the role of founder-level and venture-level signals and their relationship with the nascent ventures' quality and venture performance (Certo, 2003; Connelly *et al.*, 2011; Higgins and Gulati, 2003).

The first stream is based on arguments stemming from institutional theory (DiMaggio and Powell, 1983; Meyer and Rowan, 1977). Studies examine how a nascent venture gains legitimacy by aligning the organization with extant institutional forms and practices. Legitimacy, defined as “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions” (Suchman, 1995: p574), is difficult for nascent organizations to attain because such organizations lack an operating history and are low-power actors (Santos and Eisenhardt, 2009). However, once gained, the minimum level of legitimacy begets resources (Pollock and Rindova, 2003), and the threshold is defined differently in various stages of the organizational cycle (Fisher, Kotha, and Lahiri, 2016; Zimmerman and Zeitz, 2002).

To gain legitimacy, entrepreneurial ventures draw on generally accepted norms and values to shape investors' perceptions and interpretations of nascent ventures. Specifically, entrepreneurs use multiple mechanisms such as narratives, identity claims, or symbolic actions to garner legitimacy (Fisher *et al.*, 2016; Lounsbury and Glynn, 2001; Martens, Jennings, and

Jennings, 2007; Navis and Glynn, 2011; Zott and Huy, 2007). Narratives, identity claims, and symbolic actions are effective means of constructing legitimacy because information about the nascent ventures provides a holistic picture of “apparently independent and disconnected elements of existence” into “related parts of a whole” (Barry and Elmes, 1997). In other words, more information about entrepreneurial ventures provides less information asymmetry and uncertainty (Martens *et al.*, 2007; Shane, 2003).

In the legitimization process, media plays an important role. Media participate in legitimization as an information intermediary, propagator of legitimacy, and reflection of social evaluation. Although media is important for many reasons, it is essential to nascent venture legitimization because the exposure and framing of media reflect the public evaluation of the venture (Pollock and Rindova, 2003). Thus, the information contained in the media can be an influential factor that shapes the interpretative environment.

The second stream is encapsulated by studies focused on network theory, which focuses on relationships as they relate to organizations (Granovetter, 1985; Uzzi, 1996). These studies concentrate on the formation and exploitation of inter-organizational ties between entrepreneurs and potential resource providers such as Venture Capitalists (VCs), corporate venture capitalists (CVCs), or financial market (Hallen, 2008; Hallen and Eisenhardt, 2012; Pahnke, Katila, and Eisenhardt, 2015; Sorenson and Stuart, 2008; Stuart, Hoang, and Hybels, 1999; Vissa and Chacar, 2009). In the VC investment setting, the tie forms when an investor makes an investment decision with the focal firm.

As a motivation for tie formation, a process that examines how a combination of various factors influence organizational relationships and structural transformations, studies have found multiple antecedents that cause it, such as economic incentives, trust, inertia, or affect

(Granovetter, 2000; Gulati and Gargiulo, 1999; Sorenson and Waguespack, 2006; Sytch and Gulati, 2013; Uzzi, 1997). Unlike the assumptions of the social exchange theory, which regards motivation for network formation as instrumental, the network tie formation is motivated by economic as well as non-economic reasons.

Consequently, entrepreneurs can acquire tangible resources, including financial funding, and intangible resources, such as reputation, by generating inter-organizational ties. By establishing connections with high-quality resource providers such as prominent VCs (Hallen, 2008; Khaire, 2010; Vissa, 2011), entrepreneurs not only gain access to necessary financial capital but also garner status through association. The status is then interpreted by other investors when making their funding decisions.

The third stream is grounded in signaling theory (Spence, 1973), which describes how entrepreneurs signal their venture's quality and legitimacy to obtain resources from resource providers. The benefit of using signals is that they overcome information asymmetry between ventures and investors and help reduce the uncertainty regarding the venture (Certo, 2003; Connelly *et al.*, 2011; Shane, 2003).

While signal receivers are generally resource providers, there are different types of signals that entrepreneurs use. At the individual level, entrepreneurs signal their ability that ensures the successful implementation of entrepreneurial opportunities. Examples include the passion or preparedness an entrepreneur displays (Chen, Yao, and Kotha, 2009), the status of the CEO (Certo *et al.*, 2001), and the language and gestures entrepreneurs use (Clarke, Cornelissen, and Healey, 2019). At the venture level, characteristics that signal quality include technological patents (Hsu and Ziedonis, 2013), backgrounds of board members and CEO (Certo, 2003; Cohen and Dean, 2005; Eisenhardt and Schoonhoven, 1990a; Higgins and Gulati, 2003; Sanders and

Boivie, 2004), certification received (Lanahan and Armanios, 2018; Sine, David, and Mitsuhashi, 2007), narratives that ventures use (Martens *et al.*, 2007), and third-party affiliations (Hallen and Eisenhardt, 2012; Hsu, 2004; Plummer, Allison, and Connelly, 2016).

Each of these research streams, drawing on the different theoretical perspectives, has attempted to understand how entrepreneurs gain access to financial resources from potential investors. However, we lack an understanding of how these theoretical perspectives translate directly to the context of unicorn ventures which is a class of highly resourceful and fast-growing ventures. The reason for lack of attention to unicorn ventures is threefold. First, these high-growth unicorn ventures are collapsed into nascent ventures category, although they are distinctive from very young nascent ventures. Unicorn ventures attract disproportionate amounts of resources, such as financial and social capital. This alone distinguishes them from young, smaller nascent firms without comparable resources. Because they attract more resources, unicorn ventures require separate investigation from the entire nascent venture category. Second, some studies consider unicorn ventures to be established firms, partially because they have comparable societal impact and public awareness with established public firms. The stakeholders perceive these unicorn ventures to be similar to the larger firms due to their frequent and impactful exposure in the media. However, the unicorn ventures are not public entities and thus are less subject to public monitoring and information disclosure requirements. Third, in relation to the private entity, data on unicorn ventures is generally not publicly accessible and not representative.

Due to its recent emergence in the entrepreneurship ecosystem, we do not fully understand the mechanism of how and why unicorns emerge and how we can theoretically explicate the phenomenon.

## **1.2. Dissertation Purpose**

The purpose of this dissertation entitled “Essays on High-Growth Entrepreneurial Firms: Evidence from Unicorn Ventures” is three-fold. First, it conducts a comprehensive review of the relevant theoretical perspectives to explain unicorn ventures phenomenon. I suggest four themes in the studies. Then, I chose and focused on three main areas of relevant literature: media legitimization, resource acquisition, and venture growth or scaling. Second, the dissertation introduces and explores the exemplary group of high-growth startups by examining the emergence of unicorn ventures. I analyze the unicorn ventures worldwide descriptively. Then I find the implications of unicorns' fast-paced scaling. Also, I examine how unicorn ventures acquire financial resources at IPO. Third, building on its comprehensive review of relevant literature, I discuss implications for potential future research regarding high-growth entrepreneurial ventures.

In this dissertation, I use unicorn ventures and their emergence as a context to understand the high growth of entrepreneurial ventures conceptually and empirically by assessing the antecedents and consequences of achieving unicorn status. Below, I discuss the recent phenomenon of unicorn ventures and suggest an outline of the contents of this dissertation in greater detail.

## **1.3. Phenomena Context: Unicorn Ventures**

### **1.3.1. Definition**

A unicorn venture is a private venture firm valued at more than \$1 billion dollars of private market capitalization. Aileen Lee, a serial entrepreneur, and former partner at Kleiner Perkins Caufield and Byers, a respected Silicon Valley VC firm, introduced the term in 2013 (Lee, 2013). When Lee first coined the phrase, only 39 ventures had achieved unicorn status. Yet this

figure has since grown substantially and reached 1,088 in 2022. Due to the drastic growth in the number of unicorns and their prominent valuations, more recent and specific categorizations of unicorns have been created. For instance, Decacorns are valued at more than \$10 billion, and Hectocorns, which indicates firms valued at more than \$100 billion. In general, the term unicorn is used as a comprehensive term that includes both Decacorn and Hectocorn ventures. For the purpose of this dissertation, all ventures that meet unicorn status will be referred to as unicorn ventures.

### **1.3.2. Rarity**

Historically, a unicorn is a mystical creature with a large spiraling horn rising from its forehead, considered extremely rare and difficult to find. The term “unicorn venture” is now used as a metaphor for breakout ventures with high valuations; it reflects “both the ambition and the absurdity inherent in the tech industry today—the idea that connecting the right bits and bytes might result in magical, mythical beasts” (Manjoo, 2015). Despite its absurdity, the term unicorn venture has struck a chord among journalists, investors, and others interested in the emergence and growth of startups.

Unicorn ventures are very rare. Unicorns represent merely about one percent of firms that had received VC funding since 2005 when the first traceable unicorn was identified on the Pitchbook Database. Table 1.1 provides information about the rarity of unicorn ventures by showing the percentage of ventures that become unicorns by year. As shown in Columns A and B, the number of ventures that received Series A funding and the number of ventures that achieved unicorn status increased steadily from 2010 to 2020. Accordingly, the percentage of unicorn ventures also is also rising. Despite the growth, unicorn ventures continue to be rare compared to other firms that receive VC funding.

The highest proportion of entrepreneurial ventures became unicorns in the year 2021. Among the 38,375 ventures that received VC financing in 2021, 554 ultimately attained billion-dollar valuations. Due to the COVID-19 pandemic, ensuing monetary policy changes among many governments, and the availability of private funds, the year 2021 had drastic increases in the number of ventures that received “Series A” VC funding and the number of ventures that achieved unicorn status. Yet, the percentage of unicorn emergence remained at about one percent of all-new ventures that received Series A financing.

According to Pitchbook Database, the first company to reach unicorn status was Alibaba, founded in 1999 in Hangzhou, China as an e-commerce service provider. Yahoo!’s Corporate Venture Arm invested \$1 billion in Alibaba in 2005, making it the world’s first unicorn venture. This investment by Yahoo! represented a third-round investment. It had received two prior rounds of funding from angel investors (Fabrice Grinda and Jeffery Stibel) and VCs (Eight Roads Ventures, GGV Capital, and Insight Venture Partners). Alibaba’s revenues grew 106 percent on average from 2004 to 2011, when it turned profitable. Three years later, Alibaba made its IPO on the New York Stock Exchange.

Facebook, the social networking platform that Mark Zuckerberg founded in 2004, is recognized as the first U.S.-based unicorn venture. The company achieved this distinction in 2006, just two years after its founding. In June 2006, the investment by Interpublic Group of \$5 million for 0.5 percent equity made Facebook a unicorn. Before its IPO in 2012, the venture received 43 rounds of funding and declined two attempts to be acquired.

**Table 1-1: Unicorn Ventures as Percentage of Ventures with VC Funding (2005-2020)**

<b>Year</b>	<b>Number of ventures that received “Series A” VC funding</b>	<b>Number of ventures that achieved unicorn status from the year</b>	<b>Unicorn ventures as a % of total ventures</b>
	<b>A</b>	<b>B</b>	<b>B/A</b>
2005	1,695	1	0.06%
2006	2,204	1	0.05%
2007	2,839	2	0.07%
2008	3,000	1	0.03%
2009	2,720	3	0.11%
2010	3,555	3	0.08%
2011	4,848	7	0.14%
2012	6,151	11	0.18%
2013	6,999	12	0.17%
2014	8,006	50	0.62%
2015	8,283	61	0.74%
2016	7,184	32	0.45%
2017	9,850	38	0.39%
2018	11,856	78	0.66%
2019	11,941	96	0.80%
2020	12,099	136	1.12%
2021	38,375	554	1.44%

### **1.3.3. Geographical Distribution**

Unicorn emergence is not limited to advanced economies. The emergence is spread globally and is continuously expanding. As of 2022, unicorns are located in 47 countries across six continents.

While many unicorns are emerging in developed countries such as United States, United

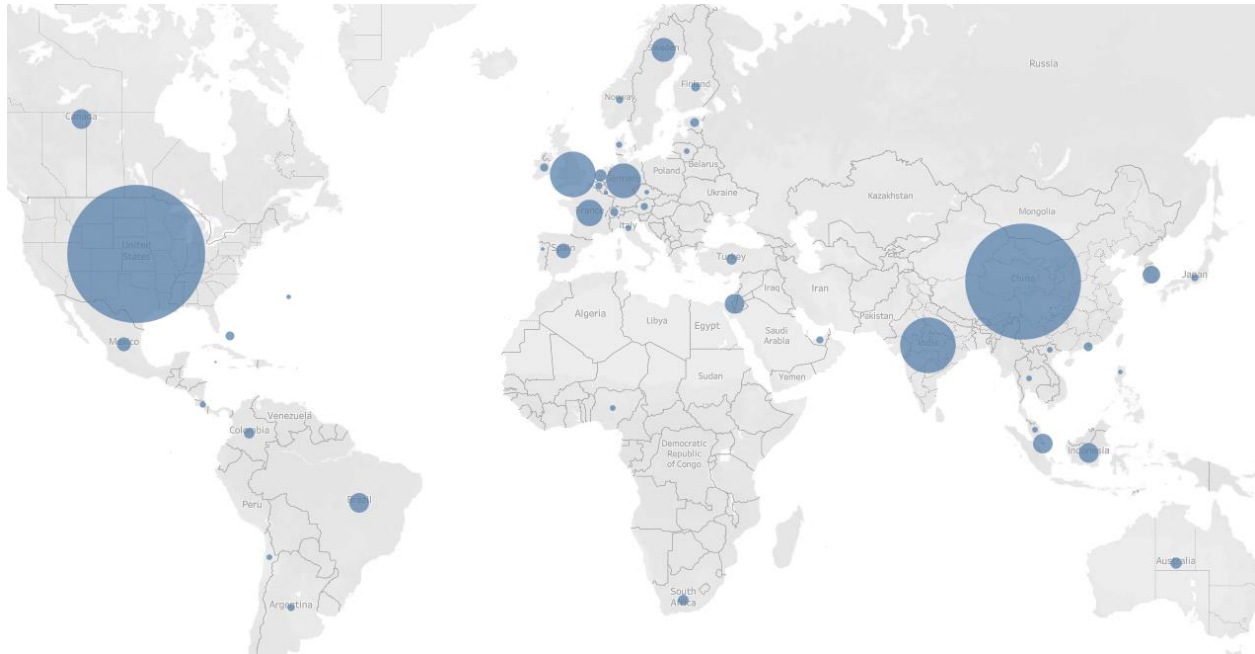
Kingdom, and Germany, many developing countries are becoming home to unicorns. Table 1.2 and Figure 1.1 provide geographical distribution information of the Top 20 countries. As the table shows, unicorn ventures are distributed not only in America (US, Canada, Mexico) or Europe (UK, Germany, France) but also in Asia (China, India, Singapore, South Korea). The US is the home of more than half (52.6%) of all global unicorn ventures; 581 out of 1,088 unicorns are in the US. China is the second-largest, home of 175 unicorn ventures, which encompasses about 16 percent of all unicorns. Next, India hosts 63 unicorns, which is 5.7 percent of all unicorns.

While unicorns are distributed globally, one noteworthy fact is the skewness of the distribution. There are a few countries that dominate the hosting of unicorn ventures. In particular, two countries, the US and China, host 68 percent of the unicorn population as of June 2022. Notably, in 2016, the United States and China hosted 80 percent of all unicorn ventures. At the time, the United States hosted 61% of all unicorn ventures and China held 19 percent. Overall, this data indicates that the skewness is shrinking; however, the dominance of the two countries continues to persist. On the other hand, adding to the skewness, there are large numbers of countries that host very few unicorn ventures. More than half of countries that host unicorns (26 countries) have three or fewer unicorn ventures. For example, Spain and Turkey each have three unicorn ventures, Thailand and the Philippines host two unicorns each, and the Czech Republic and Nigeria have only one unicorn venture each.

**Table 1-2: The Number of Unicorns by the Top 20 Countries (June 2022)**

<b>Country</b>	<b>The Number of Unicorns</b>	<b>Percentage (%)</b>
United States	581	52.6
China	175	15.9
India	63	5.7
United Kingdom	43	3.9
Germany	29	2.6
France	26	2.4
Israel	25	2.3
Canada	20	1.8
Brazil	15	1.4
Singapore	15	1.4
South Korea	12	1.1
Australia	8	0.7
Sweden	8	0.7
Indonesia	6	0.5
Mexico	6	0.5
Netherlands	6	0.5
Ireland	5	0.5
Switzerland	5	0.5
Finland	4	0.4
Japan	4	0.4

**Figure 1-1: Global Distribution of Unicorn Ventures (June 2022)**

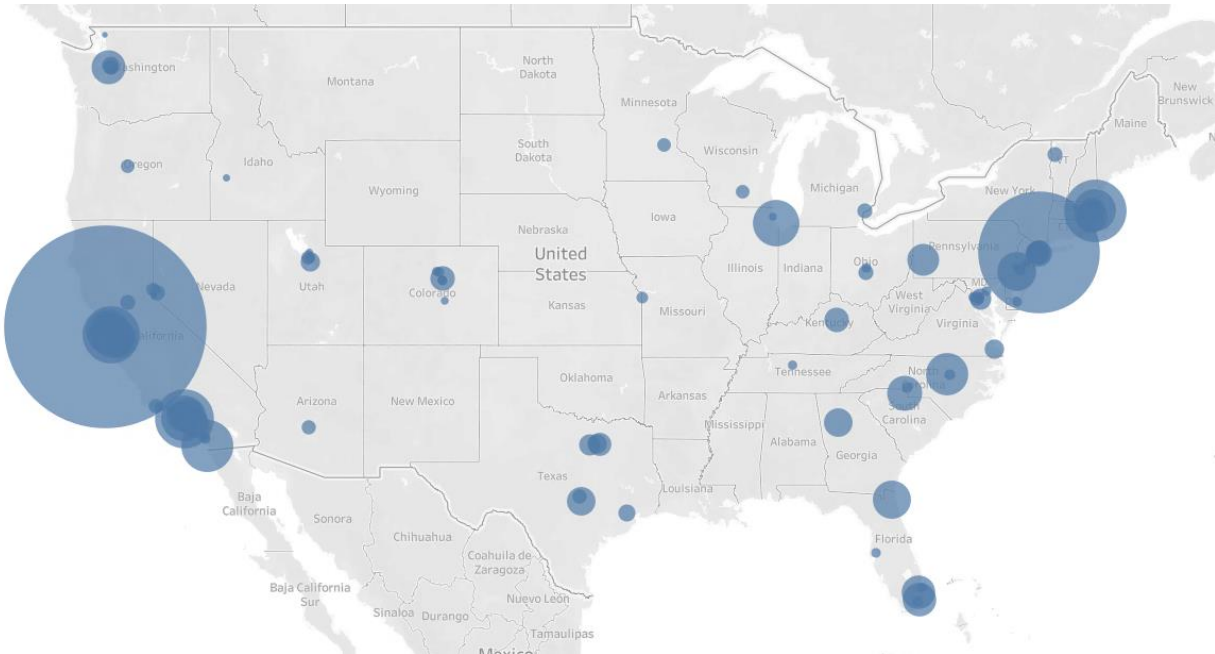


Examining US-based unicorn ventures shows similar distribution patterns, ubiquity, and skewness. Figure 1.2 provides the geographical distribution of unicorn ventures within the US. First, unicorns commonly exist in the US across the country. There are 30 states (60%) that have nurtured an entrepreneurial ecosystem suitable for a unicorn birth. Except for a few Midwestern and Southern states, most US states host at least one unicorn venture. For example, Vermont, Wisconsin, and South Carolina have one unicorn each.

Second, the skewness is also evident in the US. Figure 1.2 shows that unicorn ventures are concentrated in certain regional areas. The highest number of unicorn ventures are in the Silicon Valley and San Francisco Bay area, fostering more than half (53%, 307 unicorns) of the US unicorn venture population. The second-largest number of unicorns is concentrated in New York, with 99 unicorn ventures. The number represents 17 percent of all US unicorns. Massachusetts has 37 unicorns, which represents 6 percent. Texas, Illinois, and Washington have

also host 19, 17, and 17 unicorn ventures, respectively, each accounting for 3 percent of the US unicorn population.

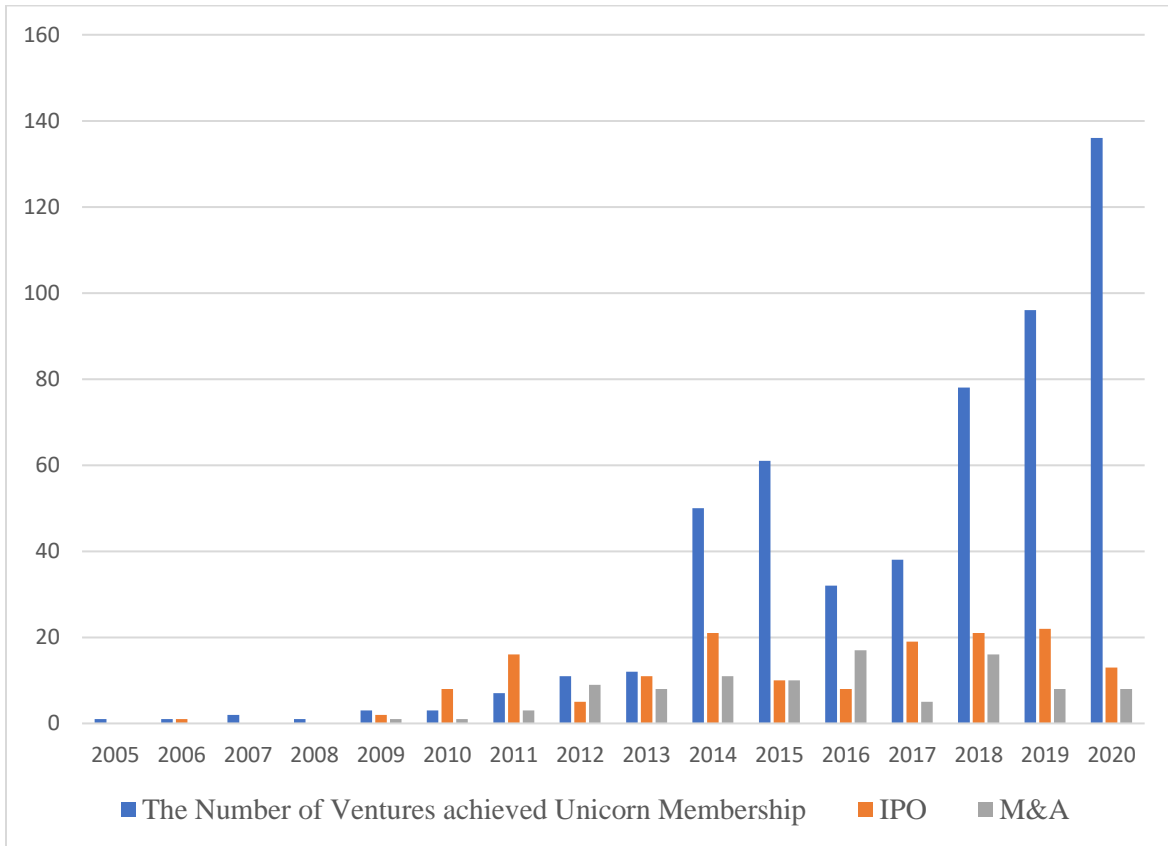
**Figure 1-2: Distribution of Unicorn Ventures in the US (June 2022)**



### 1.3.4. Exits

As the number of unicorn ventures has increased historically, so has the number of unicorn exits. Figure 1.1 tracks the number of ventures that have exited the global unicorn population over the years. Here, I consider three exit types: Initial Public Offering (IPO), Mergers and Acquisitions (M&As), and Devaluation. Some of these ventures have chosen to become public entities via an IPO, while others have been acquired or merged. I include direct listings and IPO via Special Purpose Acquisition Company (SPACs) in IPO, in addition to traditional IPO. In M&As, I consider a merger by both public and private organizations. For devalued unicorns, I highlight unicorn ventures that are out of business, defunct, and those that filed bankruptcy, particularly chapters 7, 11, or 13.

**Figure 1-3: Emergence and Exits of Unicorn Ventures (2005-2020)**

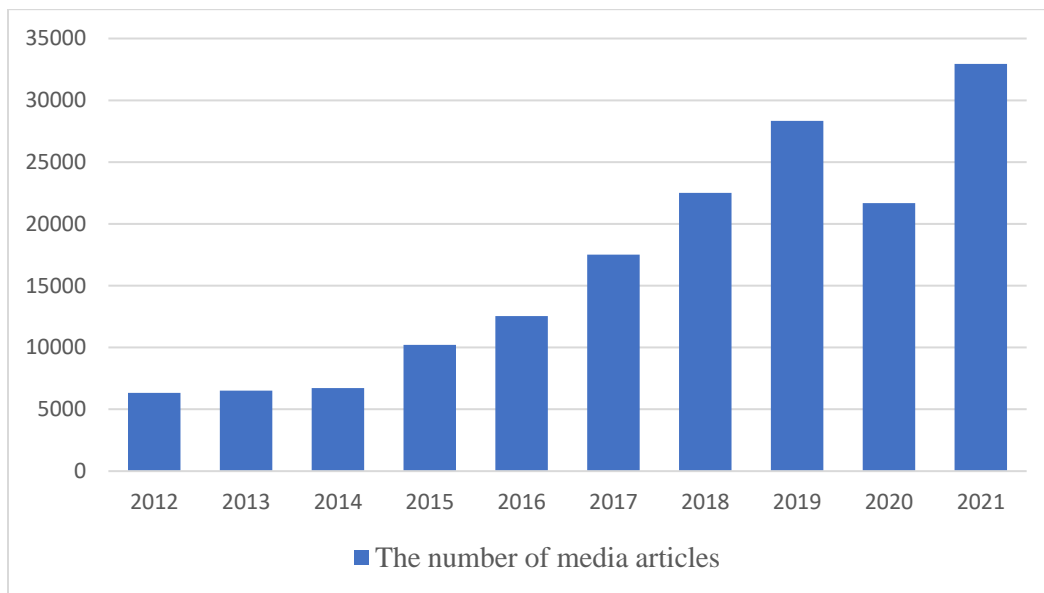


Among the three types of exits, most unicorn venture exits consist of IPOs; 162 unicorns are now publicly traded venture firms. Some well-known ventures that are now public firms include Uber, GoPro, Airbnb, and Wayfair. Some ventures exited the unicorn category via mergers and acquisitions. A total of 98 previous unicorn ventures were acquired or merged with other entities. Examples include WhatsApp and LinkedIn, which Facebook and Microsoft acquired. Only six unicorns shut down. For example, Proteus Digital Health achieved unicorn status in 2014 but struggled during the pandemic. The company filed for Chapter 11 bankruptcy in 2020.

### 1.3.5. Media Attention

Media interest in unicorn ventures has drastically increased in recent years. Figure 1.4 represents the increase. In the early 2010s, the number of media articles on unicorn ventures remained around 6,000; by December 2021, these had grown to 33,000, which is more than a fivefold increase. A search of Factiva from 2012 to 2021 shows that the use of the search term “unicorn” or “unicorn startup” (duplicate articles omitted) was on the rise. Achieving unicorn status can ignite significant public interest and increase familiarity among relevant stakeholders, and such responses increase ventures’ entrepreneurial opportunities (Brown and Wiles, 2020).

**Figure 1-4: The Number of Media Articles on Unicorn Ventures (2012-2021)**



### 1.3.6. Importance

Unicorn ventures warrant academic attention for several reasons. One reason unicorn ventures are important subject of study is that these are unlike other firms, such as smaller ventures and

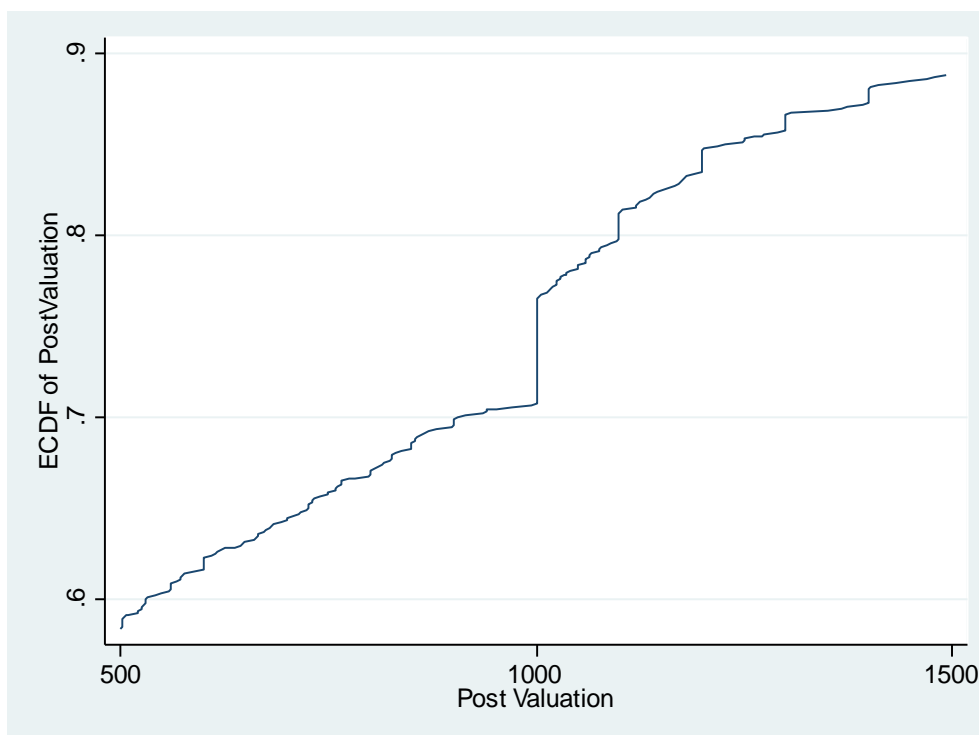
public, established firms. Not only are unicorn ventures highly resourced but this group of ventures is also watched, tracked, assessed, and even criticized more often than the average startup in the media. Though they are still private entities, such scrutiny makes them seem more like publicly listed companies. As such, they occupy an ambivalent status between private and public enterprises and face high pressure to sustain the rapid growth commensurate with super-high valuations. There is often the expectation of a future transformative event such as an acquisition or IPO, which will allow investors to realize a significant return on their investment (McNeill, 2016). Thus, closely watched entities often behave differently because they are aware they are being observed (the Hawthorne effect) and harbor lofty expectations that can affect their actions. Clearly, unicorn ventures warrant a more significant share of researchers' attention than they have received to date.

Second, unicorn ventures are worth academic scrutiny because of entrepreneurs' aspirations toward unicorn status. Pursuing and achieving unicorn status appears to be a widely shared aspiration feeding the imaginations of would-be entrepreneurs worldwide, thanks to the significant media attention that unicorn ventures garner. Entrepreneurs are eager to achieve unicorn status because it serves as a threshold for recognition and awareness. Stewart Butterfield, CEO of Slack, a unicorn venture, observes that being a unicorn “makes a difference psychologically. One billion [in valuation] is better than \$800 million because it’s the psychological threshold [that causes] potential customers, employees, and the press” to pay significant attention (Griffith and Primack, 2015).

The threshold effect is also evident from the empirical analysis. Figure 1.5 demonstrates a discontinuity in valuations of unicorn ventures. The Y-axis represents the empirical cumulative distribution function (ECDF) of all investment deals for unicorn ventures. The X-axis highlights

valuation deals falling between \$500 million and \$1.5 billion, with a discontinuity at the \$1 billion mark. As Figure 1.5 shows, compared to other valuations, a disproportionate number of deals tend to land just on the billion-dollar mark. The graph suggests that when a venture approaches a billion dollars in value, investors and founders strive to push it above the billion-dollar mark, creating a threshold effect. In other words, only a handful of ventures receive a valuation between \$800 million and a billion dollars. The discontinuity suggests that as firm valuations approach a billion dollars, the stakeholders involved make adjustments that allow them to reach unicorn status.

**Figure 1-5: Discontinuity in Venture Valuations leading up to Unicorn Valuations**



Third, unicorn ventures can have a significant economic impact on the regions and the labor markets in which they operate. These ventures, as a group, consume a disproportionate share of the VC financing available for entrepreneurial startups. In 2018, the top 10 unicorn ventures raised \$55 billion from a total of \$403 billion in venture financing allocated to new

ventures for the year. In 2021, the total valuation of all unicorns was \$2.5 trillion<sup>1</sup>. Due to the financial resource availability, unicorn ventures can create technology-related jobs that pay high wages. Since many of these ventures, albeit not all, focus on disrupting the markets in which they operate, they have the potential to make certain types of traditional jobs and industries obsolete (Kenney & Zysman, 2018). Also, because many of them received funding on the promise of disrupting incumbents (e.g., Uber, Lyft, Airbnb), many expected to take on incumbents even if that required flouting existing norms and regulations. While contravening norms and regulations can sometimes lead to unethical behaviors, the positive impact the ventures have on the economy is immense in size and effect. Thus, unicorn ventures have significant implications on regional and national economies.

#### **1.4. Dissertation Outline**

This dissertation contains the following chapters. In the ensuing Chapter 2, I provide a detailed review of the academic literature on unicorn ventures. I suggest four themes in the literature and three relevant theoretical topics: media legitimation, resource acquisition, and venture growth or scaling. In Chapter 3, I explore the antecedents of high-growth entrepreneurial ventures by examining the heterogeneity of scaling speed within the unicorn population. Previous studies have focused on scaling to understand “why” and “how,” yet the temporal aspect, an equally important subject in understanding scaling, has yet to be studied. Thus, I ask, “*What are the attributes of ventures that reach a billion-dollar valuation, and what factors are associated with the speed at which they attain unicorn status?*” I found certain founder/CEO, investment, venture, and industry characteristics associated with temporal dynamics of speed with which ventures achieve unicorn status. In Chapter 4, I investigate the consequences of high-growth

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<sup>1</sup> <https://www.cbinsights.com/research-unicorn-companies>. Accessed August 1, 2021.

entrepreneurial ventures by questioning *how high-growth venture firms are disadvantaged in resource acquisition at IPO*. Prior studies have assumed that media legitimization is always beneficial for resources, yet I suggest boundary conditions that media legitimization can be detrimental at IPO. In particular, I focus on context when multiple stakeholders are involved in the legitimization process. I found that high-growth ventures such as unicorn ventures at IPO are advantageous in acquiring financial resources; however, they are disadvantaged and have a greater level of financial resources forsaken due to the uncertainty at IPO. Discussion and Conclusion, including future studies, are presented in the final chapter, Chapter 5.

## 2. THEORETICAL BACKGROUND

“Whereof what’s past is prologue; what to come, in yours and my discharge.”

- The Tempest by Shakespeare, Act 2, Scene 1

Reviewing prior literature constitutes a critical step in understanding the unicorn ventures’ role in the emergent entrepreneurial ecosystem. In this chapter, I review previous studies on the unicorn ventures phenomenon and discuss four major themes in the current unicorn ventures-relevant studies. The four issues that the recent studies concerning unicorn ventures are a) the use of unicorn ventures is limited to anecdotal examples, b) studies show indirect relevance to unicorn ventures, c) studies focus on the financing mechanism of unicorn ventures, and d) the studies are descriptive and often a case study. While the studies provide some knowledge about unicorn ventures, we do not have a systematic and holistic understanding of them. Additionally, I suggest three potentially relevant theoretical topics for management and entrepreneurship scholars. The three main areas pertinent to high-growth entrepreneurial ventures are media legitimization, resource acquisition, and venture growth or scaling. I also summarize and highlight key studies in each area.

### 2.1. Literature Review on Unicorn Ventures Phenomenon

To comprehensively identify our current knowledge of unicorn ventures, I assessed the foremost management and entrepreneurship journals. I searched for all articles that contain ‘unicorns,’ ‘unicorn ventures,’ or ‘unicorn start up’ in the title, abstract, or keywords, and I excluded those that do not refer to entrepreneurial ventures. The journal list includes the following: *Academy of Management Discoveries*, *Academy of Management Perspectives*, *Academy of Management*

*Review, Business Horizons, Entrepreneurship Theory and Practice, Journal of Business Venturing, Journal of Business Venturing Insight, Journal of Management Studies, Management Science, Strategic Entrepreneurship Journal, Strategic Management Journal, and Venture Capital*<sup>2</sup>.

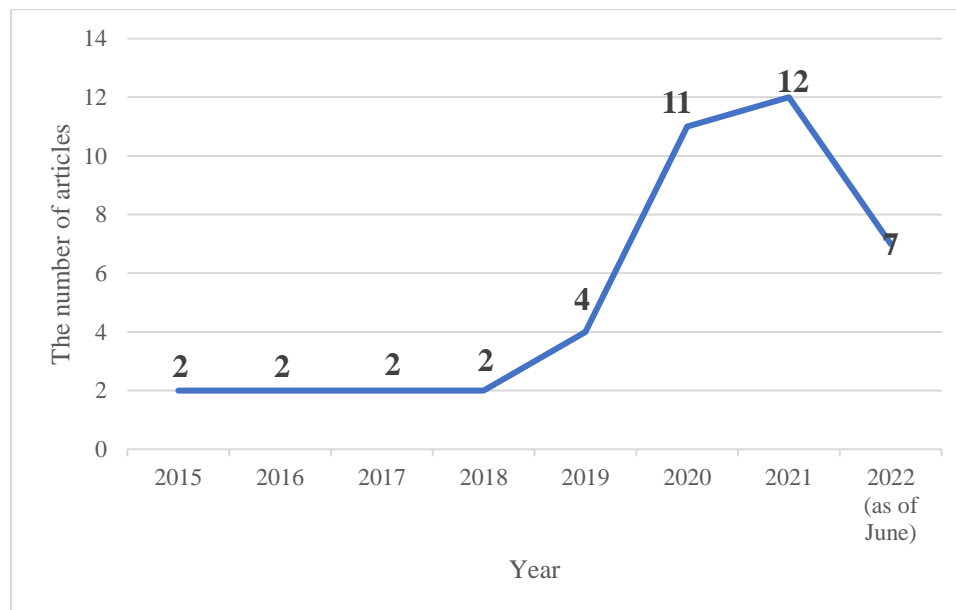
**Table 2-1: Summary of Published Articles regarding Unicorn Ventures by Journal**

Journal	The Number of Articles
<b>Management Journals</b>	
<i>Academy of Management Discoveries</i>	2
<i>Academy of Management Perspectives</i>	2
<i>Academy of Management Review</i>	1
<i>Business Horizons</i>	3
<i>Journal of Management Studies</i>	1
<i>Management Science</i>	1
<i>Strategic Management Journal</i>	1
<b>Subtotal</b>	<b>11</b>
<b>Entrepreneurship Journals</b>	
<i>Entrepreneurship Theory and Practice</i>	5
<i>Journal of Business Venturing</i>	3
<i>Journal of Business Venturing Insight</i>	2
<i>Strategic Entrepreneurship Journal</i>	4
<i>Venture Capital</i>	4
<b>Subtotal</b>	<b>18</b>
<b>Finance Journals</b>	
<i>Journal of Applied Corporate Finance</i>	4
<i>Journal of Corporate Finance</i>	2
<i>Journal of Financial Economics</i>	3
<i>Journal of Quantitative and Financial Analysis</i>	1
<i>The Review of Financial Studies</i>	2
<b>Subtotal</b>	<b>12</b>
<b>Information Systems Journals</b>	
<i>Information Systems Research</i>	1
<b>Total</b>	<b>42</b>

<sup>2</sup> I also reviewed additional journals but found no relevant studies. The list of journals that has no result or dropped due to the irrelevance to unicorn ventures include *Administrative Science Quarterly, Academy of Management Journal, Journal of Management, Journal of Applied Psychology, Journal of Organizational Behavior, Organization Science, Organization Studies, Organizational Behavior and Human Decision Processes, Personnel Psychology, Journal of Finance, and MIS Quarterly*.

In related academic disciplines such as Finance and Information Systems, emergent examinations on unicorn ventures have also addressed relevant insights. Due to the relevance to the unicorn phenomenon, I also included the following journals in the review processes: *Journal of Applied Corporate Finance*, *Journal of Corporate Finance*, *Journal of Financial Economics*, *Journal of Quantitative and Financial Analysis*, *The Review of Financial Studies*, and *Information Systems Research*. As a result of the journal and paper selection processes, I identified 41 research articles. Table 2.1 contains a summary of published articles involving unicorn ventures. As the table shows, entrepreneurship journals have 17 articles on unicorn ventures, which is a higher number than any other discipline. However, the numbers of articles in management and finance journals are 11 and 12, respectively, representing a similar level of academic interest. As Figure 2.1 illustrates, the number of research papers discussing the unicorn phenomenon has been continuously increasing recently, gaining more scholars' interest.

**Figure 2-1: Summary of Published Articles regarding Unicorn Ventures by Year**



From the review processes, I identified four critical themes in the current unicorn-relevant studies. These four themes are a) the use of unicorn ventures is limited to anecdotal examples, b) studies show indirect relevance to unicorn ventures, c) studies in finance focus on the financing mechanism of unicorn ventures, and d) the studies are descriptive and often case study. Because the theme categorization is not mutually exhaustive, six studies fall into multiple themes. Here I discuss each issue in more detail.

### **2.1.1. Unicorn Ventures as Anecdotal Examples**

A substantial number of studies delve into the unicorn ventures phenomenon, but their analyses are limited to unicorn ventures as an anecdotal example (Chahine and Zhang, 2020; Garg and Furr, 2017; Hellmann and Thiele, 2019). 16 of the 41 studies exemplified unicorn ventures as the significant example for their findings. Using a unicorn venture as an example illustrates the practical relevance of the main findings (Bradley *et al.*, 2021). Because unicorn ventures generally have high awareness among the readers, having an anecdotal example clarifies the practical implication.

For example, Chahine and Zhang (2020) begin their work with a unicorn example in the first paragraph of their study. The research examines how CEOs' human capital at the time of VC investment decision explains the likelihood of CEO change before IPO. Examining how VC monitoring affects VCs' decisions on whether to change CEO in their portfolio firms before IPO, the scholars developed a theoretical framework. The framework was specifically useful for understanding how VCs balance positive and negative ramifications of CEO change (Chahine and Zhang, 2020). To explain the commonality and necessity of CEO change, the researchers give an example of Uber and its CEO change from Travis Kalanick to Dara Khosrowshahi before its IPO in 2017. Another example is a study on venture boards (Garg and Furr, 2017).

This article examines how venture boards differ from venture investors and public firm boards. Looking at the board structure and composition of venture firms and public firms, the authors maintain that venture CEOs and board members typically have more incentives aligned with that of the firm than the public firms, having more limited formality and size in structure. To explain the importance of venture boards in a more recent entrepreneurial phenomenon, the study exemplifies Airbnb, Spotify, and Uber, representative unicorn ventures. This study emphasizes the current trend of ventures remaining private entities longer than before, and postponing the IPO, which potentially allows venture board members to have more decision-making power. While the studies of anecdotal examples illustrate the importance, emergence, and necessity of unicorn ventures in academia, they do not explain how unicorn ventures are different compared to the previous entrepreneurial phenomenon.

### **2.1.2. Indirect Relevance to Unicorn Ventures**

A significant number of studies have only indirect relevance to unicorn ventures (Aldrich and Ruef, 2018; Crawford *et al.*, 2015; Dencker, Bacq, and Gruber, 2021a; Gompers *et al.*, 2019). I consider 18 studies out of 41 to have indirect relatedness. The reason for indirect relevance is a) the study has only contextual relevance to unicorn ventures, but it is not a systematic analysis of unicorn ventures (Aldrich and Ruef, 2018; Audretsch, Lehmann, and Schenkenhofer, 2021), or b) quantitatively only some unicorns are partially included in the sample, but not the entire unicorn ventures (Cusumano, 2022; Gompers *et al.*, 2019). While the studies indicate some relevance to the unicorn ventures phenomenon, the knowledge about unicorn ventures generated from the studies is limited.

First, some studies comparatively use unicorn ventures context to distinguish their study context. While the studies in this category partially embody the contextual relevance of unicorn

ventures, the goal of the studies is not to understand unicorn ventures in general but to compare how the focal context is different from the unicorn venture phenomenon (Aldrich and Ruef, 2018; Audretsch *et al.*, 2021). The studies often assume unicorn status is a primary goal of entrepreneurs aspiring to build and grow their ventures. To illustrate, Aldrich and Ruef (2018) suggest that unicorns, as a representative reflection of hype, are a product of overestimation in their rarity and attention in academia. The study provides historical conditions and theoretical perspectives on how entrepreneurial scholars have missed the grand landscape but only myopically focused on rare, unusual phenomena. The study concluded that focusing on uncommon entrepreneurial events such as IPOs and VC investment deals may have selection bias in the sample, since they do not correctly address the entire entrepreneurial landscape. Another example is a study by Dencker and colleagues (2021), which conceptualizes the novel construct, necessity entrepreneurship. This is defined as “*generally conceived of as entrepreneurial activity arising out of need due to a lack of employment alternatives*” (Dencker *et al.*, 2021b: p 60). The study establishes boundary conditions- fulfillment of basic needs- as the foundational entrepreneurial process and argues that entrepreneur's human capital and supportive institutional levers coevolve to decide different types of necessity entrepreneurship. Here, the study compares necessity entrepreneurship with entrepreneurial endeavors geared toward fulfilling higher-level needs, which exemplifies unicorn ventures. The assumption is that unicorn ventures result from drastically different entrepreneurial interactions, contrasting with the necessity entrepreneurship.

Second, some representative studies of the indirect relevance addresses unicorn venture only partially in the sample since the main focus of such studies is on another topic. The sample subject overlap is partly due to the overlap in the research topics. Because unicorn ventures tend

to be in the more recent and emerging domain and industry, the topical overlap is inevitable. Thus, the overlap can occur in the theoretical approach and empirical sampling. For instance, the recent emergence of industry platform studies shows an exemplary overlap (Cennamo and Santalo, 2013; Eisenmann, Parker, and Alstynne, 2011). The industry platforms have attracted considerable media attention and VC investments, and their businesses resulted in innovations (Cusumano, 2022), which are also common characteristics of unicorn ventures. Cusumano (2022) estimated that “60–70% of the billion-dollar private “unicorn” startups were platform businesses, with many investors and entrepreneurs looking for the next blockbuster platform.” (p. 9) Thus, the sample between platform business model companies and unicorn ventures overlaps consistently.

Another example is a finance paper that examines the VCs’ decision-making (Gompers *et al.*, 2019). The study finds that VCs prioritize the role of founders and founding team members over a business that represents a product, market, industry, and business model. The study also finds that VCs are inflexible to the valuation but flexible to the investment amount when making investment decisions, demonstrating that rights to control are essential for VCs. The authors used survey data from the VCs, which includes VCs that invested in unicorn ventures. Comparing those with the VCs without unicorn venture investment experience, the study shows that VCs’ perception of unicorn ventures is generally overvalued. Here, the study is indirectly relevant to unicorn ventures because it partially utilizes data on VCs invested in them. However, unicorn ventures are not the focal subject. From this, we have marginally pertinent knowledge of unicorn ventures.

### **2.1.3. Financing Mechanism of Unicorn Ventures**

A large body of literature, particularly in finance journals, focuses on the financing mechanisms of unicorn ventures. Six articles in the finance journals represent this category, and the overarching goal of the studies is to understand what factors affect the high valuation of private companies (Chen, 2022; Chernenko, Lerner, and Zeng, 2017; Gornall and Strebulaev, 2020; Kwon, Lowry, and Qian, 2020). Throughout the valuation processes, the studies attempt to identify such detailed factors as different types of investors and their investment contract contents.

To illustrate an example, Gornall and Strebulaev (2020) developed a valuation model and analyzed the private valuations of 135 US unicorn ventures. Because the financial models VCs use to calculate valuation are generally not publicly available and are primarily a black box, the study merits showing the baseline valuation model for private valuation. The study finds that almost half of the unicorns (65 unicorn ventures) lose their unicorn status due to valuation-inflating terms such as liquidation preference or option pool. Thus, the result of the study questions robustness in the private valuation of the unicorn ventures in practice, indicating the prevalent overestimation of unicorn ventures' private valuation. Another example is a study by Chernenko, Lerner, and Zeng (2021). Based on the premise that the tension rises among the investors depending on the stages, the study highlights the potential agency problem between early- and late-stage investors. The study focuses on mutual funds and finds that they are more likely to invest in later stages. Additionally, mutual funds are likely to require more contractual provisions that endow more redemption rights. As these finance studies show, the studies focus on the financing mechanisms of unicorn ventures rather than the strategy or management of unicorn ventures.

#### **2.1.4. A Case Study or Descriptive Study of Unicorn Ventures**

Lastly, the recent literature includes cases or descriptive studies of unicorn ventures, and I found eight studies that fall under this theme. This theme contains eight articles, a mix of finance and business journals. The studies either show a) descriptive statistics and analyses of unicorn ventures depending on the geographical region, market segment or industry, and funding choices or contracting terms (PIPOs or toxic term sheets) (Brown and Wiles, 2015, 2020; Kenney and Zysman, 2019; Zimmerman, 2016), or b) a case study that introduces and applies a novel framework to understand entrepreneurial constructs such as design innovation, blitzscaling or product development (Kuratko, Holt, and Neubert, 2020; Straker *et al.*, 2021).

First, the studies of descriptive nature investigate interesting trends or statistical findings about unicorn ventures. Brown and Wiles (2020) show the changing market landscape for unicorn ventures by comparing the investment market in August 2015 and March 2020. The study indicates that increases in important outcomes such as the number of active firms, the aggregate market value represented in the industry, and the amount of private capital fundraising lead to more favorable conditions for unicorn ventures to finance and exit (Brown and Wiles, 2020).

Second, case studies show how entrepreneurial constructs apply to practical unicorn venture cases and how the cases lead to relevant theoretical implications. Kurakto, Holt, and Neubert (2020) suggest how blitzscaling, an aggressive scaling to reach unicorn or decacorn levels, is exemplified in several unicorn venture cases. The study divides fast growth ventures into three aggregated categories. The three categories are a) The good: Companies successful at blitzscaling, b) The bad: Companies that failed with blitzscaling, and c) The ugly: Companies that compromised ethics. By giving multiple unicorn venture cases for each category, the study

exemplifies how unicorn ventures can blitzscale in different environments, among various customer expectations, and within a variety of cultures.

## **2.2. Conclusion of Literature Review on Unicorn Ventures**

As previously discussed, studies on unicorn ventures are a) limited to introducing anecdotal examples of unicorn ventures (Bradley *et al.*, 2021; Chahine and Zhang, 2020; Garg, 2013; Garg and Furr, 2017; Hellmann and Thiele, 2019), b) have indirect relevance to unicorn ventures phenomenon (Aldrich and Ruef, 2018; Crawford *et al.*, 2015; Dencker *et al.*, 2021a; Gompers *et al.*, 2019), c) focus only on the financing mechanisms of unicorn ventures (Chen, 2022; Chernenko *et al.*, 2017; Gornall and Strebulaev, 2020; Kwon *et al.*, 2020), and/or d) are limited to cases or descriptive studies (Brown and Wiles, 2015, 2020; Kenney and Zysman, 2019; Kuratko *et al.*, 2020; Straker *et al.*, 2021; Zimmerman, 2016). Indeed, most studies do not analyze unicorn ventures as a separate group of entrepreneurial ventures. While the literature provides piecemeal evidence of knowledge about unicorn ventures, we do not have a systematic understanding of how and if unicorn ventures differ from nascent ventures or established firms. Therefore, I suggest relevant literature streams that may use the unicorn venture context to advance theoretical literature. I will elaborate on the three related lines of literature that are foci of the following chapters: media legitimization, resource acquisition, and venture growth and scaling.

## **2.3. Media Legitimization**

The first literature of possible extension from unicorn ventures is media legitimization literature. In this literature, the efforts to gain legitimacy are assumed to be a major focus of entrepreneurial ventures due to liability of newness concerns (Fisher *et al.*, 2016; Stinchcombe, 1965; Suchman, 1995). The liability of newness concerns stems from the lack of operating history and the risk of

failures with new ventures (Stinchcombe, 1965). The high-growth ventures are not exceptions to seeking legitimization and are succumb to the liability of newness. In his research, Eisenmann (2021b) accurately described the challenge:

*“VCs look for founders with the right stuff: resilience, passion, experience leading start-up teams, and so forth. But even when such rare talent captains a new venture, there are other parties whose contributions are crucial to it. A broad set of stakeholders, including employees, strategic partners, and investors, all can play a role in a venture’s downfall.”*

Previous studies generally have focused on the media’s crucial role in the legitimacy-seeking processes that entrepreneurial ventures employ (Bednar, Boivie, and Prince, 2013: 20; Pollock and Rindova, 2003; Rindova, Petkova, and Kotha, 2007). The media’s roles in the legitimization process is multifaceted. Here, I review the literature and propose a typology of media roles in nascent ventures’ legitimization processes. Table 2.2 illustrates the key research studies that examine media’s different roles in the process.

### **2.3.1. Typology of Media Roles**

The first role that media plays in the legitimization process is that of the information intermediary. Media delivers and disseminates information, records public knowledge and opinions, sets the agenda to generate attention, and frames the story (McCombs and Communication, 1993; Scheufele and Tewksbury, 2007). As a traditional means of communication, media is considered a promoter of others’ agenda, or “fight promoters,” distinct from organizations that intend to promote their own agenda (Jonsson and Buhr, 2011). In an effort to deliver objective and unequivocal messages (Klebe Treviño, Webster, and Stein, 2000), the media often takes an investigative role to provide more in-depth coverage of new ventures.

While the infomediary role of media emphasizes objective information delivery, media tends to distill, simplify, and sometimes dramatize complex information to draw the attention of the general public (Zavyalova, Pfarrer, and Reger, 2017). Such attention-seeking nature of media enables it to filter information and select a relatively minor issue facing nascent ventures by making it more “newsworthy” to draw public attention (Hoffman and Ocasio, 2001; Zavyalova *et al.*, 2012). For example, scenarios that attract media attention often include organization-level achievements, CEO- or manager-level scandals, litigation, and/or competition (Rindova *et al.*, 2007; Tan, 2016; Zavyalova *et al.*, 2012).

The second is the role of a “propagator of legitimacy.” Drawing on social cognition research, the studies on media’s role as legitimacy propagator explore how available information affects the evaluation and judgment of organizations amid uncertainty (Pollock and Rindova, 2003; Pollock and Gulati, 2007; Pollock, Rindova, and Maggitti, 2008). Here, legitimacy is the degree to which stakeholders perceive a nascent organization and its activities as socially acceptable and desirable because its actions are aligned with norms and societal expectations (Lounsbury and Glynn, 2001).

As a propagator of legitimacy, the media provides visibility and “cognitive legitimacy” (Aldrich and Fiol, 1994) through frequent exposure of the nascent venture’s actions. Such media exposure increases the visibility and the public’s familiarity with the venture. Therefore, more visibility in the news position not-yet-legitimate ventures as constituting an increasingly coherent category, which helps in the sensemaking of nascent industry, ventures, and ventures’ behaviors (Kennedy, 2008; Petkova, Rindova, and Gupta, 2013; Pollock and Rindova, 2003). In other words, media legitimizes nascent ventures by providing opportunities for stakeholders to learn vicariously and iteratively about a venture’s actions.

**Table 2-2: Key Studies on the Different Roles of Media**

<b>Research</b>	<b>Research Question</b>	<b>Key Findings</b>	<b>Focus Role of Media</b>
Hoffman & Ocasio, 2001	When and how do industries publicly attend external events?	Industry-level attention is triggered either externally by outsiders' attributions of accountability or internally by insiders' internal enactment of events regarding industry image and identity. Contestation and contradiction of both outsiders and insiders play an essential role in enacting events.	Infomediary
Lounsbury & Glynn, 2001	How do entrepreneurial stories facilitate the crafting of a new venture identity?	Successful entrepreneurial stories emphasize distinctiveness when the institutional context has legitimacy. Once the stories can receive credibility, fidelity, and resonance among the audience, ventures will gain legitimacy more easily and acquire more significant resources.	Legitimacy Propagator
Pollock & Rindova, 2003	How the information shared on media shape market behaviors?	The media visibility of initial public offerings influenced the nascent venture's underpricing and stock turnover. The result indicates that investors viewed ventures with more media attention as more legitimate.	Legitimacy Propagator
Rindova, Pollock, & Hayward, 2006	How does media construct organizational celebrity by creating a "dramatized reality" in selectively reporting firms' actions and newsworthy stories?	Organizational celebrity is a socially approved intangible asset that a nascent venture can garner amidst uncertainty. Media creates dramatic narratives of the developing venture by portraying a venture as a protagonist amid dramatic conflict. Nascent ventures tend to stand out due to nonconforming strategic actions. The ventures gain impression management benefits.	Infomediary
Fiss & Zajac, 2006	How does symbolic language framing fit influence strategic change?	Between the two forms of framing, acquiescence, and balancing, greater visibility in media tend to relate to balancing framing. Firms using balancing framing will gain greater stock evaluations.	Reflection of Evaluation
Rindova, Petkova, & Kotha, 2007	How do new firms in emerging markets build initial	Firm-level action and frequency increase the salience and lead to a firm's visibility and strategic character building. Firms' innovative actions create expectations about value-generating potential, which results in favorability. A combination of symbolic and innovative actions lead to the esteem of a	Infomediary, Reflection of Evaluation

<b>Research</b>	<b>Research Question</b>	<b>Key Findings</b>	<b>Focus Role of Media</b>
	reputations through market actions?	firm because the actions create distinctive, vivid, and memorable exemplar of the new category.	
Scheufele & Tewksbury, 2007	How framing, agenda-setting, and priming of mass media are interrelated?	While priming and agenda setting are based on memory-based information processing, priming is a temporal extension of agenda-setting that focuses on the temporal saliency of the issue. Framing is based on how an issue is characterized and understood by audiences. The three concepts are different regarding news production, new processing, and locus of effect.	Infomediary
Pollock, Rindova, & Maggitti, 2008	How do the recency and availability of information influence attention and evaluation?	While both information and availability cascades concern reducing uncertainty about choice, they have different mechanisms; information cascades are based on a rational quest for informational advantages, but availability cascades arise from the dominance of information. Both independent direct and inter-cascade combined effects of media attention are positively associated with future attention in both the focal community and other communities.	Infomediary, Legitimacy Propagator, Reflection of Evaluation
Kennedy, 2008	How are markets of nascent ventures formed and categorized?	Information on media about nascent ventures provides sensemaking grounds for new market formation. The cognitive embedding of messages in press releases using co-mentions with rivals can enhance nascent ventures' prominence in media.	Legitimacy Propagator, Reflection of Evaluation
Jonsson & Buhr, 2011	How does media influence cultural entrepreneurship?	Business media can influence the standard of evaluation. When negative press contends current practices, organizations can counteract accordingly to defend.	Infomediary, Reflection of Evaluation
Navis & Glynn, 2011	How are entrepreneurial identities understood and evaluated?	Entrepreneurial identity is judged plausible when ventures' legitimating claims are aligned with expectations within an uninstitutionalized category but distinctive from other established categories.	Reflection of Evaluation
Petkova, Rindova, & Gupta, 2013	How do new ventures attract media attention and resource acquisition?	New ventures that engage in a more intense sense of giving efforts attract a greater level of specialized industry media attention and VC funding. Diverse sensegiving efforts also attract general media but do not help in obtaining VC funding	Legitimacy Propagator

<b>Research</b>	<b>Research Question</b>	<b>Key Findings</b>	<b>Focus Role of Media</b>
Garud, Schildt, & Lant, 2014	How can entrepreneurial projective stories help ventures gain legitimacy?	Entrepreneurial projective narratives set expectations about nascent ventures to establish legitimacy. However, paradoxically, the expectations helped the venture to establish legitimacy can delegitimize in case of failure to meet the expectations.	Reflection of Evaluation
Zavyalova, Pfarrer, & Reger, 2017	How is organizational celebrity built, maintained, and lost?	Organizational celebrity is built by media that attract social attention and significance, resulting in emotional responses. Depending on different responses among stakeholders, celebrity or infamy may vary in effect size and temporal aspect.	Infomediary, Reflection of Evaluation
Fisher, Kuratko, Bloodgood, & Hornsby, 2017	How do entrepreneurs manage new venture legitimacy judgments across diverse audiences?	Four different mechanisms of legitimization (Identity, Associative, Organizational, and Factors beyond control) work differently based on different audiences, including crowdfunding backers, government agencies, angel investors, and venture capitalists.	Legitimacy Propagator, Reflection of Evaluation
Navis & Glynn, 2017	How do new market categories emerge and are legitimated internally and externally?	Newmarket categories gain legitimacy when their identity claims, linguistic frames, and announced affiliation focus less on similarity within a category and more on distinctiveness from collective identity.	Legitimacy Propagator, Reflection of Evaluation
Vanacker, Forbes, Knockaert, & Manigart, 2020	How do prospective resource providers respond to multiple simultaneous signals of different strengths made by nascent ventures.?	Media attention plays an important role in multiple simultaneous signals of different strengths for entrepreneurial firms. While media attention plays a significant positive moderating effect between weak signals and resource attractions, it exerts less impact on the effectiveness of strong signals.	Legitimacy Propagator, Reflection of Evaluation

The third role of media concerns a reflection of social evaluation. Once the newsworthy stories are published, the different social stakeholders respond with their evaluation and judgment toward the nascent venture, thereby impacting its legitimacy (Fisher *et al.*, 2017). In doing so, media coverage shapes social perceptions of entrepreneurial identity. There is continuous mutual reinforcement between newsworthy stories and social perception; in return, socially constructed evaluation and judgment about the entrepreneur and nascent venture emerge.

The newsworthy stories that embed socially evaluated venture identity have multiple sources. The sources that are reflected in the media are, for example, entrepreneurial story-telling (Garud, Schildt, and Lant, 2014b; Lounsbury and Glynn, 2001; Martens *et al.*, 2007), specific framing languages (Fiss and Zajac, 2006), impressions (Elsbach, 1994), the language of analogies in schema and scripts (Hargadon and Douglas, 2001), and identity claims (Navis and Glynn, 2011, 2017). All these sources of stories are reflected in the media articles and influence stakeholders' perception of early-stage ventures.

As previously highlighted, the multiple roles of media constitute legitimization processes of nascent ventures simultaneously throughout the process. Initially, the media serves as an infomediary to provide information about nascent ventures. The vicarious environment created by media coverage then enables stakeholders to exchange information and discuss the highlighted ventures. Using frames and analogies, nascent ventures share their projective entrepreneurial stories and identity claims (Fiss and Zajac, 2006; Garud *et al.*, 2014b; Hargadon and Douglas, 2001; Martens *et al.*, 2007; Navis and Glynn, 2011). Stakeholders share their evaluation and judgment about the nascent ventures, and their evaluation is tied together by intertextual linkages (Garud *et al.*, 2014b). The media, in turn, reports this discourse. As a result, the media plays a

reflective role in social evaluation. During this process, some narratives, including information and agenda-embedded stories, garner more attention than others from the audience. Some narratives are more newsworthy because of media's roles in distilling, simplifying, and dramatizing reality. The narratives that garner greater visibility and familiarity are more likely to be perceived as socially acceptable by the public. The more exposure and framing of nascent ventures as socially fit to the public, the more effectively media plays a "legitimacy propagator" role and the nascent ventures can gain legitimacy.

The media legitimization literature can take a major step forward by contextualizing the media legitimization process within the unicorn ventures phenomenon. The previous studies have not separated media's multifaceted roles but collapsed their different roles into a singular one, assuming that the media is only limited to a certain role in a certain context. While this can be true for the previous nascent ventures, unicorn ventures provide richer context to investigate how different roles simultaneously interplay in the legitimization processes. Because unicorn ventures' projection in the media is much greater than smaller nascent ventures' media exposure, more availability in data and variance can provide interesting context.

#### **2.4. Resource Acquisition**

The second possible literature to connect unicorn ventures is resource acquisition literature. The acquisition of resources is a central feature of entrepreneurial ventures' activities. Entrepreneurship is often defined as a product of entrepreneurial opportunities and resources (Aldrich and Fiol, 1994; Shane and Venkataraman, 2000). Here, entrepreneurial opportunities are defined as "situations in which new goods, services, raw materials, and organizing methods can be introduced and sold at greater than their cost of production" (Shane

and Venkataraman, 2000: p. 220). Entrepreneurial resources refer to “all the tangible and intangible assets controlled by an entrepreneur, or accessible via social ties, that enable him or her to exploit an entrepreneurial opportunity” (Clough et al., 2019: p. 240). Thus, entrepreneurship cannot be understood without appropriate attention to resource acquisition and mobilization.

While a significant body of literature has examined how entrepreneurial opportunities emerge, only a small number of studies have examined how entrepreneurs acquire resources. One exception is a recent study by Clough and colleagues (2019) on the entrepreneurial resource acquisition and mobilization process, which emphasizes the necessity for studying multiple stages of firm emergence. This study notes, “The study of multiple stages allows the building of a more comprehensive process theory of resource mobilization by shedding light on how search, access, and transfer mechanisms vary over the stages of firm emergence.” (p. 261) Given the foundational nature of the study, we can build on entrepreneurial resource acquisition.

In this section, I divide relevant studies on entrepreneurial resource acquisition into two categories based on the type of resources: tangible and intangible. Table 2.3 provides the key studies on resource acquisition.

**Table 2-3: Key Studies on the Resources Acquisition**

<b>Key Studies</b>	<b>Resource Type</b>	<b>Consequences (Dependent Variable)</b>	<b>Main Arguments/Mechanisms</b>
Pollock & Rindova, 2003	Tangible	Financial resources at IPO (IPO Underpricing and Turnover)	From a social constructionist perspective, the study argues that information provided by institutional intermediaries- the media- influences the investors' perception and their choices at IPO.
Jonsson & Buhr, 2011	Tangible	Financial resources (Net Investment Flow of Mutual Funds)	Media not only can make the target subject more visible and legitimate but also shape the standard and norm to evaluate the target, influencing the market culture and institutional change. In addition, the media effect can be limited to the partial organizational field when the fields are in contested areas.
Petkova, Rindova, & Gupta, 2013	Tangible	Financial resources (VC Funding)	Allocation of attention is an antecedent of media legitimization processes, and the process requires distinct cognitive, comprehensive, and evaluative assessments of legitimacy. Depending on the allocation of attention, measured by the different industry/general media types, the legitimization will have different outcomes.
Pfarrer, Pollock, & Rindova, 2017	Tangible	Financial resources (Cumulative abnormal adjusted return)	Different types of intangible assets (Status and Celebrity) in the media affect firm outcomes differently. Affect-based social approval in the media creates boundary conditions for firm evaluation.
Hubbard, Pollock, Pfarrer, & Rindova, 2018	Tangible	Strategic Alliance	The status and celebrity generated via the media have different interpretative effects on equivocal information. The multiple information cues in the media can create incongruity in the interpretative frames, thus in greater perceived uncertainty.
Bednar, Westphal, McDonald, 2022	Tangible	Board member selection	Media coverage, particularly #MeToo relevant content, serves as a channel to deliver intergroup anxiety, social evaluation of corporate board members, and thus, work as a corporate governance monitoring.

<b>Key Studies</b>	<b>Resource Type</b>	<b>Consequences (Dependent Variable)</b>	<b>Main Arguments/Mechanisms</b>
Rindova, Petkova, & Kotha, 2007	Intangible	Reputation	Media constitute an audience, and the exposure accounts for the newsworthy attention. Also, the media contents become an input for sensemaking processes.
Bednar, 2012	Intangible	CEO job security (CEO dismissal and compensation)	Media can play a governance control mechanism because it responds favorably to actions that conform to the prevailing agency logic. The institutional pressure from the media can influence CEOs' dismissal and compensation levels.
Bednar, Boivie, & Prince, 2013	Intangible	Strategic Change (Resource allocation)	Media that works as an external evaluation of firms can cause firms to change. Negative news coverage can signal the inadequacy of the current strategy, thus leading to strategic change.
Zavyalova, Pfarrer, & Reger 2016	Intangible	Organizational Celebrity / Infamy	Drawing on social psychology and mass communications research, this study illustrates the media serve as a critical facilitator for social approval assets such as celebrity or infamy.
Kolbel, Busch, & Jancso, 2017	Intangible	Financial Risk	Media coverage of corporate social irresponsibility (CSI) creates an agenda-setting context. The agenda-setting can influence stakeholders' sanctions, potentially increasing financial risk and the reach and severity of coverage moderates the stakeholders' sanctions.
Gamache, McNamara, 2019	Intangible	Strategic Actions (Subsequent acquisition spending)	Media coverage, particularly negative media, can lead to negative emotions and reduced confidence in CEOs because media serve as a negative indicator of external feedback. The stakeholders' pressure can accompany the external pressure on the firm.
Howard, Kolb, & Sy, 2020	Intangible	Likelihood of IPO	CEOs use media to disclose the firm information to represent their ventures strategically. The media communication strategy, via tonality and volume, shapes entrepreneurial identity, leading to a more favorable representation of the venture at IPO.

### **2.4.1. Tangible Resources**

First, some studies investigated the effects on tangible resources. Previous studies show that media legitimization helps nascent ventures to gain tangible resources such as financial resources, strategic alliances, and certain types of board members. For example, Pollock and Rindova (2003) investigated the effect of media legitimation on resource acquisition at the initial public offerings (IPO). The scholars argued that the amount and nature of the information that the media provides influences the nascent ventures' access to resources. Measuring IPO underpricing and turnover for the stock as resources, the study found that media legitimization can increase both the financial capital at IPO and the demand for shares of nascent ventures. Also, Petkova and colleagues (2013) demonstrated how media attention affects VC funding in an early legitimization process. Differentiating among diverse sense-giving activities by general and specialized media, the study found that media attention in the specialized media is associated with a higher level of VC funding obtained (Petkova *et al.*, 2013).

### **2.4.2. Intangible Resources**

On the other hand, some research has focused on the media's effects on intangible resources, illustrating that media legitimization positively influences how new ventures gain them. Using a sociological perspective, these studies have examined how media plays a role in acquiring intangible social approval assets such as organizational reputation, celebrity, or infamy. To illustrate, Rindova and colleagues (2007) examined how new ventures in emerging markets build their reputations by looking at the patterns of media coverage. Using an inductive theory-building approach, they found that market actions lead to a cognitive stimulus of venture properties and thus generate esteem, favorability, and visibility in the media.

Also, studies using an economics perspective have investigated the impact of media coverage on financial risk or CEO job security. For example, Kolbel, Busch, & Jancso (2017) explored the relationship between corporate social responsibility (CSR) and risk management. They highlighted how media plays a crucial mediating role between CSR and risk management. The study argues that media coverage of corporate social irresponsibility (CSI) creates a financial risk for firms due to a potential increase in stakeholder sanctions. In the process, the media serves as an agenda-setting channel that stakeholder groups attend to. They provide evidence that the media's reach and severity moderate the relationship between corporate social responsibility and financial risk management. Another study provides a behavioral view of the media and corporate governance (Bednar, 2012). The study argues that media can act as a governance control mechanism because it responds favorably to actions that conform to the prevailing agency logic. When the young firms do not conform to agency logic, the externally imposed institutional pressure through the media affects firms' decisions, such as CEOs' dismissal and compensation levels.

More academic attention on how unicorn ventures gain access to their tangible and intangible resources will improve the literature by addressing how high-growth ventures acquire more resources than others. Unicorn ventures can provide promising research context for resource acquisition because they have garnered both tangible and intangible resources; for tangible resources, disproportionate amounts of financial and human resources are raised by the high-profile category of nascent ventures. As for intangible resources, simply having the 'unicorn' label can garner social approval assets that influence their strategic consequences. Given this, as we study these recent unicorn venture phenomena, entrepreneurial resource

acquisition literature can guide us to view these phenomena as an opportunity to test and augment existing theory.

## **2.5. Venture Growth and Scaling**

Thirdly, unicorn ventures can provide a beneficial context to study venture growth and scaling. Growth and scaling have been largely assumed to be a natural consequence of ventures' survival in entrepreneurship. The topic has been embedded in scholarly interest, as it is sometimes equivalently substituted as the venture size or profitability, and it has not yet been distinctively conceptualized in the entrepreneurship literature. Despite its importance in entrepreneurship, venture growth and scaling research has conceptually lagged behind venture formation and founding.

While growth is embedded regardless of the life cycle or firm size, the challenges to smaller startups are not comparable to that of mature companies. Entrepreneurial firms confront unique constraints compared to established firms (Garg, 2013; Gavetti, Helfat, and Marengo, 2017; Stinchcombe, 1965) because entrepreneurial firms often compete in nascent and and/or in high-velocity, and fast-moving domains (Bremner and Eisenhardt, 2021). The ventures might require novel business models (McDonald and Eisenhardt, 2020b) to compete in the high market and technological uncertainties (Murray, Kotha, and Fisher, 2020). Due to the unique challenges that entrepreneurs face in growing their firms, scholars should pay more attention to them.

Table 2.4 demonstrates that we have limited knowledge of venture growth and scaling due to a lack of academic attention. It has only been in recent times that researchers started to delve into the topic of venture growth.

**Table 2-4: Key Studies on Venture Growth and Scaling**

<b>Key Studies</b>	<b>Journal</b>	<b>Year</b>	<b>Research Question</b>	<b>Main Arguments/Mechanisms</b>
Baum, Locke, and Smith	Academy of Management Journal	2001	What causes venture growth?	Venture growth requires a multifaceted process by which entrepreneurs affect competitive strategy and performance. The study explores five research domains (personality traits and motives, competencies, situationally motivation, competitive strategy, and business environment) and tests the hypotheses using a multilevel model.
Gilbert, McDougall, and Audretsch	Journal of Management	2006	Review of venture growth literature	The review study offers several critical issues in the literature: a) the previous literature has focused more on “how much” than “how” or “why,” b) the literature is fragmented in the measurement of growth, and c) the locus of venture growth is often unclear.
McKelvie and Wiklund	Entrepreneurship Theory and Practice	2010	Review of venture growth literature	The review study illustrates how different modes of growth: organic, acquisition, and hybrid, provide a further avenue to explain the lack of studies on “how” ventures grow.
Baum and Bird	Organization Science	2010	How does an entrepreneur’s successful intelligence influence new venture growth?	The training of entrepreneurs can nurture venture growth. The study finds that Successful Intelligence (SI), which consists of practical, analytical, and creative intelligence, predicts venture growth. The research suggests that certain personality traits of an entrepreneur contribute to entrepreneurial growth.
DeSantola and Gulati	Academy of Management Annals	2017	How is growth considered internal to ventures?	The study suggests an integrative review of how endurance and change narratives describe growth. The study suggests the internal dilemma associated with growth by structuring around three organizational dimensions (organizational design, team composition, and culture).
Mathias and Williams	Journal of Business Venturing	2018	How does entrepreneurs’ role transition affect venture growth?	Entrepreneurs who narrowed their role set ultimately allowed for venture growth. The study shows how entrepreneurs’ experience of three role-related mechanisms influences venture growth; perceiving the entrepreneurial role identity, discovering role identities, and role identity imprinting.

Studying venture growth and scaling in the unicorn venture context allows researcher to build more comprehensive process theory about the growth of such ventures. The linkage between the unicorn ventures and the venture growth and scaling literature can shed light on how fast-pacing ventures grow. Many unanswered questions require understanding the mechanisms of high growth and how unicorn ventures' strategies vary over the different growth stages. Because unicorn ventures have high heterogeneity within the population and across different groups of organizations, such as nascent ventures or larger established firms, scholars can understand unique growth mechanisms. For example, researchers can study various antecedents of growth (Desantola and Gulati, 2017), different growth modes, including organic, acquisition, hybrid (McKelvie and Wiklund, 2010), and trajectories (Gilbert, McDougall, and Audretsch, 2006).

## **2.6. Conclusion**

This chapter reviewed research in many disciplines focused on unicorn ventures. In the literature review, I discussed what management and entrepreneurship scholars know about unicorn ventures. I then systematically analyzed the existing research on unicorn ventures and found four main themes: a) the use of unicorn ventures in the study is limited to anecdotal examples, b) studies do not have direct relevance to unicorn ventures but only indirect relevance, c) studies in finance generally concentrate on the financing mechanism of unicorn ventures, and d) the studies are often descriptive and a case study. Each theme represents pieces of knowledge that is known about unicorn ventures at this time.

However, the literature does not provide information regarding how unicorn ventures behave as a group. In other words, little is known about what these vastly different ventures have

in common. While unicorn ventures are an indispensable group of nascent ventures in the entrepreneurial ecosystem due to their fast-paced, highly resourced growth, we do not yet have a systematic and holistic understanding of them. Thus, examining the unicorn ventures with relevant theories allows for a more fruitful discussion of entrepreneurial actors. In order to examine unicorn ventures more thoroughly, this chapter suggested three potentially relevant theoretical topics for management and entrepreneurship scholars. The three main areas relevant to high-growth entrepreneurial ventures are media legitimation, resource acquisition, and venture growth or scaling.

The three suggested streams of literature can take a significant step forward by contextualizing the unicorn ventures phenomenon. First, using the media legitimation literature, we can understand how media's multifaceted roles and their relationship with their audience can differently influence venture legitimization. Because unicorn ventures attract much greater media, more data availability can shed light on our understanding of media legitimization for high-profile ventures. Secondly, we can test and augment existing resource acquisition theories more robustly using the context of unicorn ventures. The tests and extension of theories are possible because unicorn ventures garner an unprecedentedly high level of both tangible and intangible resources that have not been available in the past. Third, consideration of venture growth and scaling literature within the context of unicorn ventures can enrich our understanding of how ventures grow and scale. The high variance within the unicorn population and across different actors in the business ecosystem enables future studies on the diverse antecedents of growth, diverse mechanisms, and consequences of venture growth and scaling.

In the subsequent chapters, I quantitatively explore the dynamic interactions between stakeholders (i.e., resource providers or media) and unicorn ventures. In Chapter 3, I suggest how unicorn ventures have differences in scaling speed up to \$1 billion, and in Chapter 4, I examine how unicorn ventures differently or similarly acquire financial resources at IPO.

### 3. TIME TO VENTURE SCALING: AN EXPLORATORY STUDY

“The big company executives tend to be interrupt-driven. In contrast, when you are a startup executive, nothing happens unless you make it happen. In the early days of a company, you have to take eight to ten new initiatives a day or the company will stand still. There is no inertia that’s putting the company in motion. Without massive input from you, the company will stay at rest.”

- Ben Horowitz, *The Hard Thing About Hard Things* (2014:111)

#### 3.1. Abstract

While ongoing practitioners’ attention to unicorn ventures has been significant, academic researchers have paid little attention. Unicorn ventures- high-growth entrepreneurial ventures of more than \$1 billion in private market valuations are an emerging category of ventures in the entrepreneurship domain. This chapter explores and analyzes different factors influencing unicorn venture scaling; the growth speed to reach unicorn status. Drawing on prior research on growth and valuation, the study focuses on the temporal dynamics of unicorn ventures to assess variations in the scaling speed at which they reach a billion dollars in valuation. Using the entire unicorn venture global population of 927 as of June 2022, this chapter investigates associations between founder, venture, investment, and industry characteristics and the temporal dynamics of speed to reach unicorn status.

### 3.2. Introduction

Unicorn ventures represent an interesting phenomenon that has ignited the imagination of would-be entrepreneurs, and the term has struck a chord among journalists, investors, and others interested in the growth and valuation of startups. A unicorn venture is a private firm valued at more than one billion dollars. Aileen Lee, a serial entrepreneur, and former partner at Kleiner Perkins, a respected Silicon Valley VC firm, introduced the term in 2013 (Lee, 2013). Since then, once a new venture is valued at more than \$1 billion, it is labeled a “unicorn” and comes under increased scrutiny from the media, analysts, regional politicians, and the public.

Historically, unicorns are mystical creatures with a sizeable spiraling horn rising from their forehead. In legend, unicorns were extremely rare and difficult to find. The term “unicorn venture” is thus used as a metaphor for breakout ventures with high valuations, reflecting “both the ambition and the absurdity inherent in the tech industry today—the idea that connecting the right bits and bytes might result in magical, mythical beasts” (Manjoo, 2015).

Despite practitioner and media interest in unicorn ventures, little academic research has focused on the phenomenon although some scholars urged other to study the firms. For instance, Dushnitsky and Matusik (2019), observe that the rise of “*new phenomenon and data sources over the decade [have given] give rise to an increased need for rigor analysis and informed debate in exploring the implications of these developments.*” (p. 438) In response to this call and to address this gap, we analyze the unicorn venture population to explore and describe such ventures' growth. In so doing, I generate insights into extreme cases of venture growth and scaling, particularly the speed of scaling.

Unicorn ventures tend to scale rapidly and become big entrepreneurial players reasonably

quickly; they may significantly impact the market categories, industries, and regions in which they operate (Bhidé, 2003; Delmar, Davidsson, and Gartner, 2003). For such ventures, fast growth *“is key to realizing entrepreneurial success. An entrepreneurial idea may have substantial potential, but it is not until it is deployed at a scale that the potential is fully realized”* (Dushnitsky and Matusik, 2019: p. 442). While unicorn ventures as a group are known to scale faster than smaller nascent ventures, there is speed heterogeneity among the unicorn ventures population. Some reach the billion-dollar valuation mark very quickly, while others may take more time. Such variations in temporal dynamics provide a conducive setting to investigate scaling speed. By taking advantage of the context, I ask the following research question: *“What factors are associated with the speed at which they attain unicorn status?”*

By focusing on the scaling speed of unicorn ventures, I shed light on the temporal aspect of factors that affect “revolutionary entrepreneurial ventures” (Bhidé, 2003) designed to exploit large market and technological (Shane and Venkataraman, 2000) and entrepreneurial opportunities (Aldrich and Fiol, 1994; Davidsson, 2015). Exploring factors that affect when a venture becomes a unicorn is a relevant topic for entrepreneurship scholars interested in how ventures grow and scale (Beckman, 2006; Desantola and Gulati, 2017). Such extreme cases exemplify the upper strata of startups in terms of growth speed, resourcing, and exploiting opportunities. As such, they can offer a valuable context for examining variations in scaling speed found among high-growth entrepreneurial ventures (Kuratko *et al.*, 2020).

Another goal of the chapter is to explore and better understand the overall unicorn ventures phenomenon. Unicorns exemplify fast-scaling category of nascent ventures that achieved vast growth. Also this chapter provides a foundation for further research into rapidly

growing ventures funded by VCs. Due to its exploratory nature, rather than conducting a formal test of proposed hypotheses, I examine the scaling speed of unicorn ventures using the extant entrepreneurship literature to guide the exploration. Since unicorn ventures exhibit significant differences in the speed at which they have achieved unicorn status, I examine factors associated with the time taken to attain the status.

The structure of the chapter is as follows. I first examine the extant literature that has discussed internal (founder/CEO and venture) characteristics and external (industry and investment) factors associated with high-growth ventures. Next, I describe the data and methods I used to investigate the speed at which ventures have achieved unicorn status. I describe the results and discuss the findings by outlining a research agenda on temporal dynamics of growth and scaling pertaining to the unicorn ventures population.

### **3.3. Theory**

Prior research on new venture growth has highlighted various factors associated with growth, including “*entrepreneur characteristics, resources, strategy, industry, and organizational structure and systems*” (Gilbert et al., 2005: p. 928; see also McKelvie & Wiklund, 2011). More recent contributions have suggested that investment characteristics, such as types of investors (Brown and Wiles, 2015; Chernenko et al., 2017) are potentially important factors that can impact growth. Below, I briefly review studies of venture growth associated with these factors. Following the previous literature, I categorized factors into two broad characteristics: internal (i.e., entrepreneur (CEO/founder) and venture characteristics) and external to the venture (i.e., industry and investment characteristics).

### 3.3.1. Internal Characteristics

#### 3.3.1.1. Founder/CEO Characteristics

*Education and experience.* Previous studies have examined the effect of founder or founding team's educational background and previous experiences (Baum, Locke, and Smith, 2001; Hambrick, Geletkanycz, and Fredrickson, 1993; Wasilczuk, 2000) on venture outcomes such as valuation, growth, and venture success (Eesley and Roberts, 2012). Because education and industry experience influence where and how entrepreneurs gain the knowledge required to make business decisions, they can signal a team's human capital, expertise, and productivity-enhancing skills (Shane and Stuart, 2002). Prior founding experience can build competencies and influence the actions taken under the conditions of uncertainty that are endemic in new venture settings (Buchele, 1967; Mullins, 1996; Sarasvathy, 2001). Presumably, experienced founders make better decisions than relatively novice ones (Gilbert *et al.*, 2006). Evidence suggests that entrepreneurs with successful track records are more likely to receive funding and succeed in the long run (Gompers *et al.*, 2006).

In certain industries in sciences, founding teams with doctoral educations are more likely to receive higher valuations because of signaling effects (Hsu, 2007). Tamaseb (2021) recently observed, "Whether it's better to have a technical degree or a *non-technical CEO is a famous debate within the startup world. Some think technical expertise is indispensable to the head of the company, but others think business acumen is more important and that an engineer cannot run a company.*" It is assumed that entrepreneurs from well-regarded universities have more success at garnering attention from top-tier VC capitalists compared with graduates from less-known institutions, thereby allowing them to scale more quickly (Tamaseb, 2021). Although the

research has not examined the impact of Ivy League or elite university affiliation on startup valuations and scaling speed, evidence suggests that entrepreneurs who attend top-ranked universities are over-represented in the ranks of U.S.-born founders (Wadhwa, Freeman, and Rissing, 2010).

**Gender.** Some evidence suggests that an entrepreneur's gender has an effect on the venture valuation (Fischer, Reuber, and Dyke, 1993; Lee and Huang, 2018; Marlow and McAdam, 2013). The studies argue that VCs often discriminate against women who relatively lack technical skills and technology degrees, given that men who possess such degrees attract more VC funding (Tinkler *et al.*, 2015). As a result, it is not surprising that men start most VC-funded ventures; only 4.4% of firms that received VC funding had a female founder, capturing just 2.2% of total VC dollars in 2017 (Zarya, 2018). Since this may or may not be the case for the unicorn population of ventures, I examined whether a founder's gender was associated with the speed at which a venture achieved unicorn status.

**Solo founders.** Prior researchers have assumed that larger teams size can garner more resources required to operate a business than those ventures founded by single individuals (Eisenhardt and Schoonhoven, 1990b; Wasserman, 2012). This assumption stems partly from the notion that startups require a portfolio of skills and resources that one individual is unlikely to possess. Having several founders is also assumed to be additive or synergistic; a team of founders should thus scale a venture more quickly than a single founder (Greenberg and Mollick, 2018; Miloud, Aspelund, and Cabrol, 2012). Tamaseb (2021) observes that most aspiring entrepreneurs are encouraged to take on partners, and many accelerator programs “*push founders*

*away from solo entrepreneurship and encourage co-founder ‘dating’ rituals as part of the program” (p. 17).*

The logic for creating larger founding teams stems partly from the findings from Eisenhardt and Schoonhoven’s (1990) classic study of semiconductor startups, which showed that team size was positively associated with venture growth. They argued that “*more founders means that there are more people available to do the enormous job of starting a new firm that there is more opportunity for specialization in decision-making*” (p. 510). In the context of the French VC industry, Miloud et al. (2012) demonstrated that team-founded ventures received a higher valuation than those with a solo founder, presumably due to the speed at which they could grow.

Greenberg and Mollick (2018) offer a contrasting perspective. They suggest that since founders spend considerable time working together, often under conditions of uncertainty, ambiguity, and risk, disagreements and conflicts are unavoidable. Deciding which opportunities to pursue or forego can pose challenges that must be debated and resolved as a team to ensure progress toward goals (Eisenmann, 2021a). From a crowdfunding context, Greenberg and Mollick (2018) showed that ventures started by individuals tend to survive longer than those formed by a team. Solo founders also generated more revenue, which measures growth, than ventures founded by pairs. Financially, solo founders performed no differently than startups founded by larger teams. However, we are unaware of any studies that have examined how founding team size is related to the temporal dynamics associated with achieving critical valuation milestones, a proxy for growth or scaling.

### 3.3.1.2. Venture Characteristics

**Geographical Location.** A venture's geographic location may explain significant variation in valuation, growth, and survival rates (Lechner and Dowling, 2003). Since VCs operate in regional clusters (Chen *et al.*, 2010), some locations foster increased competition among investors, resulting in higher valuations for ventures looking for funds. For example, ventures in startup-hub states such as the Silicon Valley in California receive higher valuations than those located elsewhere (Wasserman, 2017). The evidence suggests that those ventures in geographic clusters ('agglomeration economics') may absorb relevant knowledge from the local environment allowing them to achieve higher growth and performance (Gilbert, McDougall, and Audretsch, 2008; Saxenian, 1996b; Sorenson and Stuart, 2001). However, some ventures in densely networked markets may experience a lower valuation than those in sparsely networked markets (Hochberg, Ljungqvist, and Lu, 2010). Although the evidence is mixed, researchers are keenly interested in how location and region may affect new ventures, especially when it comes to valuation (The Economist, 2022) and the temporal dynamics associated with growth.

The West Coast and Silicon Valley regions of the U.S. offer greater access to financial and human capital, making it easier for ventures in Palo Alto and San Jose to finance growth and hire experienced employees needed to scale rapidly (Hanson, 2000; Saxenian, 1996b). On the other hand, ventures outside of well-endowed entrepreneurial clusters often lack these opportunities (The Economist, 2022). During the late 1980s and early 1990s, valuations on the U.S. West Coast were higher than in other parts of the country (Gompers and Lerner, 2000). Since many unicorn ventures are based in Silicon Valley (McNeill, 2016), we wanted to examine the association between location and speed to attain a billion-dollar valuation. Also, since many

ventures are established outside the U.S., I examine how nationality was associated with scaling speed as reflected in venture valuations.

***Accelerators.*** Recently accelerators have arisen within the entrepreneurial ecosystems. Accelerators are groups that give greater access to support such as mentors, program directors, customers, and guest speakers. These groups also help ventures connect with alumni, and peers (Cohen, Bingham, and Hallen, 2019; Hallen, Cohen, and Bingham, 2020). While evidence suggests that ventures supported by accelerators often scale more quickly by raising capital faster and gaining customer traction sooner (Hallen *et al.*, 2020), it is unclear what role accelerator affiliation plays in how quickly venture valuations increase beyond the early funding rounds.

***Business Models.*** With the rapid growth and diffusion of the Internet, software platforms business model has received significant attention (Parker, Alstyne, and Choudary, 2016). Online businesses depend on software to connect multiple players in the market such as buyers and sellers, riders and drivers, job seekers and recruiters, hosts and guests (Hagiu and Wright, 2016; Parker and Alstyne, 2016). Such ventures increase their value by having direct and indirect network externalities. Due to the effect of network externalities, the disruption in the established markets often leads to only a few “winners” in each sector (Shapiro, Carl, and Varian, 1998). When perceived as one of a few winners, the venture’s business attracts significant investment at lofty valuations. It remains not clear how platform businesses are associated with venture scaling, as reflected in the time it takes to reach a billion dollars in valuation.

***Profitability and Intellectual Property.*** Profitability and growth are important signals of venture progress (McDonald and Eisenhardt, 2020a). Ventures that turn profitable early or exhibit higher level of revenues tend to attract investments at higher valuations (Gompers and

Lerner, 2000). When such ventures show ability to validate financial resource providers' key assumptions in terms of profit, they are perceived as more legitimate, leading to access to greater level of resources and valuations. Patents also signal progress and offer monopolistic benefits. Evidence has shown that doubling the average patent application stock increased valuation among semiconductor ventures (Hsu and Ziedonis, 2013). This study is particularly interested in examining how such factors are associated with the speed at which a venture achieves unicorn status.

### **3.3.2. External Characteristics**

#### **3.3.2.1. Industry Effects and Investment Characteristics**

*Industry Effects.* Evidence of industry effects on venture growth or valuation is not strong. Hsu (2007) found that the internet, software, biotech, communications, and other industries were statistically not significant when regressed against the venture valuations. Likewise, Fitza et al. (2009) also failed to find any systematic differences across sectors regarding a valuation change from one round to the next. Thus, we have unclear understanding of the industry effects on the temporal dynamics of valuation pertaining to high-growth ventures.

*Seed Funding and Angel Investment.* Studies have shown that the amount of financial resource is affiliated with venture growth (Bamford, Dean, and McDougall, 2000; Birley, 1987; Lee, Lee, and Pennings, 2001). Financial capital amount can provide entrepreneurs greater sustainability (Cooper, Gimeno-Gascon, and Woo, 1994). It can also give them the time and resources to implement strategic objectives (Zahra and Bogner, 2000), pursue ambitious strategies (Bhidé, 2003), or follow a course of action to discover what resonates with customers (Hampel, Tracey, and Weber, 2019). For nascent ventures, seed funding or angel investment

provides an early signal that the proposed venture represents an opportunity worth pursuing, a strong legitimacy signal on which to seek funding in follow-on rounds.

***Corporate Venture Funding and Grant.*** Connections to external funding sources such as corporate venture capital or governmental grant are substantial predictors of new-venture growth, especially in the technology domain (e.g., Lee et al., 2001). Some studies have investigated corporate venture capital's effect on venture performance (Chemmanur, Loutschina, and Tian, 2014; Dushnitsky and Lenox, 2006; Park and Steensma, 2012). Park and Steensma (2012) found that corporate venture capital has a contingent effect on firm value. The study shows that corporate venture capital is beneficial for new ventures when they require specialized, as opposed to general, complementary assets. Other studies have shown that government programs to support startups facilitate venture growth in terms of employment and sales (Bertoni, Martí, and Reverte, 2019; Hottenrott and Richstein, 2020). Bertoni and colleagues (2019) found that government-supports increased employment and sales growth by 10.6% and 18%, respectively, using 512 entrepreneurial ventures data that received Spanish government support between 2005 and 2011.

***Equity held by VCs and Deal Size Amount.*** Studies have found mixed results in terms of the effect of investor-relevant factors on valuation. Investor-relevant factors include venture's growth trajectory, hiring decisions, reduced exposure to principal-agent risk, and relative investor control during funding rounds (Wasserman, 2012, 2017). For instance, Hsu (2007) found that the percentage of a venture's equity investors in Series A rounds have positive relationship with the round's valuation. However, the study also finds that the investor control has negative relationship with the valuations. This result is perhaps due to the higher risk such

ventures may have by having more investor control. When founders relinquished their control during successive investment rounds (e.g., CEO position, giving up board control), pre-money valuations decrease (Wasserman, 2017).

New ventures that pursue innovative technologies depend on the entrepreneur's ability to obtain significant VC funding (Fisher *et al.*, 2016). In other words, a venture's ability to scale depends on the amount of capital it attracts. Thus, growth measured as the number of employees may accelerate following VC investment (Davila, Foster, and Gupta, 2003). VCs generally support ventures that scale rapidly since such growth strategies may be valued by other shareholders, leading to higher market valuation (Rosenbusch, Brinckmann, and Müller, 2013).

***Secondary Transaction.*** The market for secondary transactions provides investors of entrepreneurial firms a liquidity event, an opportunity to divest their assets. Studies on secondary transactions have been emerging recently (Andrieu and Peter Groh, 2021; Nadauld *et al.*, 2019), and the primary focus has been on the investors. Andrieu and Groh (2021) suggest the risk-neutral financial models assess the intention of investors in the secondary market. The study found that investors intend to 'strategically exit' in line with their portfolio management. Yet, no one fully understand how the secondary transaction influences the focal entrepreneurial ventures.

### **3.4. Data and Methods**

#### **3.4.1. Data**

The data used in this chapter is a set of unique data from Pitchbook, a private financial database focusing on internal and external factors. This source provides investment round longitudinal data for all ventures. Since Pitchbook provides round-level data, we focused on "investment deal" as the unit of analysis. I compiled the global population of unicorn ventures as of June

2022, including 7,566 investment deals of 1,082 unicorn ventures. I omitted unicorn ventures with incomplete deal information (i.e., in progress or canceled investment deals), and those missing deal dates and valuation. I also omitted firms missing relevant evidence to reach unicorn statuses, such as a lack of investment deal that reached either pre-money or post-money valuation of \$1 billion. Finally I dropped investment rounds that had raised funds using revolving credit lines or loans to relate to the focal goal. Thus, the final dataset includes 5,320 investment deals of 927 unicorn ventures founded from 1999 to 2021.

### **3.4.2. Variables**

For the dependent variable, I used *unicorn status*, assigned a value of 1 if a venture achieves a billion dollars in valuation in a given year and zero otherwise. We assumed that a venture had joined the unicorn club when its investment deal valuation, either pre- or post-money reported, equaled, or exceeded a billion dollars.

I grouped key independent variables into broad categories—internal factors, such as founder/CEO and venture characteristics, and external factors, such as industry and investment characteristics.

#### **3.4.2.1. Internal Factors**

**Founder/CEO Characteristics.** I gathered founder/CEO information from Pitchbook, including *Ivy League affiliation*, *elite university affiliation*, *different types of degrees* (MBA., PhD., MD, and JD), and any *technical degree* obtained in engineering or computer science fields, *gender*, and *solo founder*. To operationalize *educational background*, I used three dummy variables. The first variable would be *Ivy League university*, given a value of 1 if a founder/CEO had earned a degree from an Ivy League universities in the U.S. and zero otherwise. The second variable, *elite*

*university*, assigns a value of 1 if a founder/CEO had earned a degree from an elite university and zero otherwise. I compiled the list of the elite universities from the Top 10 US News College Rankings in North America in 2018. The list included Stanford, Massachusetts Institute of Technology, University of California Berkeley, California Institute of Technology, University of Washington, University of California Los Angeles, and others. The third dummy captured whether the founder/CEO had earned a technical degree in a field like engineering or computer science. If so, I assigned a variable value of 1 and zero otherwise. To capture the founder/CEO's *expertise*, I also used dummy variables for the types of educational degrees the person has by measuring MBA, PhD, MD, and JD. For management backgrounds, the person was coded as 1 if the person has an MBA degree, zero otherwise. To measure knowledge expertise, I coded as 1 if the founder/CEO has a PhD degree and zero otherwise. For medical and legal background, I coded 1 if the founder/CEO has MD and JD degrees, respectively, and zero otherwise. I used a dummy variable to operationalize *gender*, giving it a value of 1 if a founder was female and zero otherwise. Lastly, to operationalize the *solo founder* variable, I created a dummy variable that received a value of 1 if a sole entrepreneur started a venture, and zero otherwise.

**Venture Characteristics.** I collected information such as *geographical location*, *accelerator experience*, *business model*, *financial performance*, and *intellectual property* to measure venture characteristics. I collected information on a venture's headquarters (HQ) and geographic location to examine the impact of geographical location<sup>3</sup>. I used four dummy variables to capture geographic locations in the U.S., Silicon Valley, China, and India. The top

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<sup>3</sup> To check the reliability of this information, I randomly checked 25% of our firms and found no discrepancy between this search and Pitchbook's information.

three countries are based on the number of unicorn ventures hosted. For the location in the US, I coded 1 if the unicorn venture HQ is in the US and zero otherwise. To measure location in Silicon Valley, I assigned a value of 1 if the venture was in Silicon Valley or the San Francisco (California) Bay Area and zero otherwise. For ventures based in China and India, I assigned a value of 1, and zero otherwise for each country, respectively. To capture *venture profitability*, I assigned a value of 1 if a venture was profitable at the time of investment and zero otherwise. Also, for revenue, I coded 1 if a venture created revenue, not profitable, at the time of investment, and zero otherwise. To measure *accelerator experience*, I generated a dummy variable and assigned a value of 1 if the venture received funding from an accelerator and zero otherwise. For capturing the *platform business model*, I coded 1 if a venture utilized a platform business model and zero otherwise. The *intellectual property* measure was operationalized by separately counting the number of active and pending patents at the time of the investment deal.

#### **3.4.2.2. External Factors**

**Industry Characteristics.** Recognizing that young firms driven by information technology may be hard to classify, I used six broad industry classifications provided by Pitchbook to examine industry effects for transparency in the follow-on research.

**Investment Characteristics.** To study the relationship between investment characteristics and unicorn status, I included *seed funding, angel investment, corporate venture funding, grant, deal size amount, percent of equity held by VCs, the number of investors, and the new investors* in the model. To operationalize whether a venture received *seed funding*, I created a dummy variable of 1 if a venture had received seed funding and zero otherwise. *Angel investment* is measured by a dummy variable, which assigns 1 if a venture had received angel

investment and zero otherwise. *Corporate venture funding* is coded as 1 if a venture received investment from corporate venture capital and zero otherwise. The *grant* variable is also a dummy variable assigned 1 if a venture received government grant funding, including the Paycheck Protection Program (PPP) from US Small Business Administration (SBA), and zero otherwise. *Deal size amount* captures the amount of financial investment received in dollars at the time of the investment deal. *Equity held by VCs* measures the percentage of equity given to the investor in exchange for the investment fund. The *number of investors* is the total number of investors who made investment decisions for the investment deal. *The number of new investors* measures the total number of investors that previously had not invested in the unicorn venture and were investing for the first time in the venture.

### **3.4.3. Methods**

Since this chapter aims to understand the factors influencing the time to scale, I used a discrete time-event history analysis to estimate models. In this approach, I assigned time windows into “spells,” shorter periods that reflect the change in the value of time-dependent covariates. Since daily spells could introduce noise into the estimation, while annual spells might not capture rapid changes, I chose quarters as the unit of duration.

I used a proportional hazard regression model, a common approach to modeling discrete time-event history analyses (Allison, 1984; Cleves *et al.*, 2008). The hazard function for a venture would be joining the unicorn club during a specific spell if it survived to that point. Our proportional hazards model is:

$$h(t|\mathbf{X}) = h_0(t) \exp(\boldsymbol{\beta}'\mathbf{X}),$$

where  $h(t|X)$  is the hazard function at time  $t$  given the covariate matrix,  $X$ ;  $h_0(t)$  is the baseline hazard function, and  $\beta$  is the column vector containing the estimated regression coefficients. Our parametric model used the Cox model as its baseline hazard. Hence events could occur at any point in a given window and require no assumptions about the hazard's probability distribution. I log-transformed some variables to reduce skewness and kurtosis (Cohen, Nelson, and Walsh, 2002).

### **3.5. Results**

Table 3.1 illustrates descriptive statistics for the unicorn venture population. Overall, correlations were low, except between active and pending patents and between the number of investors and the number of new investors, which were both 0.92, raising concerns about potential multicollinearity. However, this is not the case here because Cox regression models will not converge or provide results when multicollinearity is present.

Table 3.2 highlights the results of the Cox proportional hazard models. This longitudinal analysis considers all funding investment deals from founding until a venture achieves unicorn status. Since all of our ventures reached a billion dollars within the observed time period, right censoring was not a concern. Model 1 is the industry-only model, with dummy variables to account for different industries in the dataset. Model 2 through 4 shows the association between the three sets of independent variables (i.e., founder/CEO, venture, and investment characteristics) and the scaling speed. Model 5 shows only the statistically significant relationships with the time it takes to reach unicorn status.

**Table 3-1: Descriptive Statistics**

Variables	Mean	Std. Dev.	Min	Max	-1	-2	-3	-4	-5	-6
1 Unicorn Status	0.13	0.34	0	1	1					
2 Business Products and Services (B2B)	0.12	0.33	0	1	0.03	1				
3 Consumer Products and Services (B2C)	0.20	0.40	0	1	-0.01	-0.15	1			
4 Energy	0.01	0.10	0	1	0.03	-0.03	-0.03	1		
5 Financial Services	0.06	0.25	0	1	0.00	-0.09	-0.11	-0.02	1	
6 Healthcare	0.08	0.27	0	1	0.01	-0.11	-0.13	-0.02	-0.08	1
7 Information Technology	0.51	0.50	0	1	-0.02	-0.41	-0.49	-0.09	-0.30	-0.35
8 Materials and Resources	0.01	0.10	0	1	0.00	-0.04	-0.04	-0.01	-0.03	-0.03
9 CEO Ivy School Affiliation	0.14	0.34	0	1	-0.01	0.09	-0.04	-0.03	0.01	0.15
10 CEO Elite School Affiliation	0.13	0.34	0	1	0.01	0.00	0.00	0.04	-0.05	0.02
11 CEO Management background(MBA)	0.17	0.37	0	1	0.01	0.01	0.05	-0.03	0.07	0.06
12 CEO Expertise(PHD)	0.08	0.27	0	1	0.02	-0.03	-0.04	0.03	-0.06	0.08
13 CEO Medical background(MD)	0.02	0.14	0	1	0.01	0.00	-0.02	-0.01	-0.04	0.34
14 CEO Legal background(JD)	0.02	0.14	0	1	0.00	-0.05	0.05	-0.01	0.01	0.00
15 CEO Technology background	0.46	0.50	0	1	-0.03	0.04	-0.06	0.03	-0.05	-0.07
16 Female CEO	0.03	0.17	0	1	0.02	-0.01	0.06	0.01	-0.02	0.10
17 Solo Founder	0.11	0.31	0	1	0.02	-0.05	0.10	0.02	-0.02	0.00
18 Location in the Silicon Valley	0.19	0.39	0	1	0.00	-0.06	-0.12	-0.05	-0.03	-0.04
19 Location in the US	0.52	0.50	0	1	-0.01	0.05	-0.22	-0.05	-0.07	0.09
20 Location in China	0.16	0.36	0	1	0.01	-0.03	0.10	0.05	-0.06	0.00
21 Location in India	0.08	0.27	0	1	-0.03	0.06	0.26	-0.02	0.03	-0.08
22 Accelerators	0.20	0.40	0	1	-0.02	0.05	-0.08	0.01	-0.01	0.02
23 Profitability	0.11	0.31	0	1	-0.03	0.00	0.11	0.00	0.07	-0.06
24 Revenue	0.88	0.32	0	1	0.02	0.00	-0.10	-0.05	-0.07	0.04
25 Platform Business Model	0.01	0.11	0	1	-0.01	-0.04	-0.05	-0.01	-0.03	-0.04
26 Active Patents	9.09	61.84	0	962	-0.03	-0.04	0.08	0.01	-0.04	-0.01
27 Pending Patents	5.32	37.91	0	535	-0.02	-0.02	0.06	0.02	-0.03	0.00
28 Deal Size Amount (log)+	3.31	2.07	-4.61	9.99	0.38	0.02	0.07	0.04	0.04	0.01
29 % VC Equity Ownership (log)++	2.64	0.86	-3.00	4.61	-0.15	0.01	-0.01	0.02	0.02	0.06
30 Seed Funding	0.46	0.50	0	1	-0.03	0.02	-0.10	-0.02	-0.03	0.00
31 Angel Investment	0.13	0.34	0	1	-0.02	0.02	0.01	-0.03	-0.03	0.02
32 Corporate Venture Funding	0.11	0.31	0	1	0.00	0.01	0.09	0.08	0.05	0.02
33 Secondary Transaction	0.36	0.48	0	1	-0.06	-0.02	0.08	-0.05	0.01	-0.06
34 Grant	0.13	0.33	0	1	-0.01	0.04	-0.02	0.07	0.02	0.05
35 # Investors	4.85	5.40	1	110	0.15	0.03	-0.05	-0.01	0.01	0.00
36 # New Investors	3.16	4.48	0	110	0.08	0.02	-0.04	0.01	0.02	0.00

N= 7,566, +N=6,355, ++N=3,684

**Table 3-1: Continued**

	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16	-17	-18	-19	-20
8	-0.12	1												
9	-0.13	0.11	1											
10	0.01	-0.02	-0.06	1										
11	-0.11	0.02	0.24	0.23	1									
12	0.00	0.12	-0.01	0.08	-0.10	1								
13	-0.18	0.11	0.15	0.06	0.04	0.16	1							
14	-0.01	-0.02	0.08	0.01	0.03	-0.04	-0.02	1						
15	0.09	-0.04	-0.03	0.22	0.09	0.14	-0.04	-0.09	1					
16	-0.09	0.06	0.07	0.01	0.05	-0.02	0.01	-0.03	-0.06	1				
17	-0.03	-0.02	-0.04	-0.10	-0.04	0.02	-0.02	0.00	-0.08	0.09	1			
18	0.18	-0.06	-0.03	0.18	0.01	-0.03	-0.01	0.02	0.06	-0.02	-0.07	1		
19	0.12	0.02	0.21	0.21	0.01	0.03	0.08	0.08	0.04	0.08	-0.09	0.42	1	
20	-0.03	-0.02	-0.09	-0.09	-0.04	0.11	-0.03	-0.03	-0.08	-0.03	0.32	-0.14	-0.33	1
21	-0.19	-0.03	-0.09	-0.09	0.06	-0.08	-0.04	-0.04	0.12	-0.05	-0.07	-0.18	-0.43	-0.06
22	0.01	0.03	-0.05	0.04	-0.08	0.00	-0.02	-0.03	0.04	0.05	-0.07	0.13	0.12	-0.11
23	-0.08	-0.03	0.05	-0.03	0.06	-0.04	-0.04	0.04	-0.02	0.02	0.04	-0.06	-0.08	0.10
24	0.09	0.03	-0.05	0.03	-0.05	0.01	0.03	-0.04	0.01	-0.01	-0.05	0.06	0.08	-0.10
25	0.11	-0.01	-0.02	0.03	-0.04	-0.02	-0.02	-0.02	0.06	-0.02	-0.04	0.11	0.00	0.01
26	-0.01	0.00	-0.03	-0.01	-0.04	0.01	0.00	0.00	0.03	-0.01	0.02	0.01	-0.01	0.14
27	-0.02	0.01	-0.02	-0.02	-0.03	0.02	-0.01	0.02	0.03	0.00	0.03	-0.02	-0.03	0.15
28	-0.09	0.01	0.02	-0.01	0.04	0.00	0.01	0.02	0.00	-0.01	-0.02	-0.05	-0.08	0.03
29	-0.06	0.05	0.01	0.01	0.03	-0.02	0.03	-0.03	0.00	0.00	-0.06	-0.03	0.07	-0.15
30	0.09	-0.02	0.00	-0.01	-0.07	-0.05	-0.05	-0.05	-0.02	0.07	-0.04	0.03	0.03	-0.09
31	-0.01	0.00	-0.06	-0.03	-0.03	-0.05	-0.03	0.03	0.01	0.04	-0.01	-0.08	-0.08	-0.04
32	-0.13	0.06	-0.02	-0.10	-0.04	0.06	0.01	-0.05	-0.02	0.01	-0.03	-0.12	-0.14	0.05
33	-0.01	0.00	-0.03	0.00	0.02	0.03	-0.03	0.08	0.07	0.03	-0.07	-0.01	-0.04	0.06
34	-0.08	0.12	0.04	0.01	0.03	0.03	0.06	0.05	0.05	0.00	-0.06	-0.01	0.10	-0.03
35	0.01	0.01	0.03	0.08	0.01	-0.03	0.00	-0.01	0.02	-0.01	-0.06	0.13	0.12	-0.12
36	0.00	0.01	0.02	0.08	-0.01	-0.02	0.01	0.00	0.01	-0.02	-0.04	0.11	0.11	-0.08

**Table 3-1: Continued**

	-21	-22	-23	-24	-25	-26	-27	-28	-29	-30	-31	-32	-33	-34	-35
22	-0.12	1													
23	0.02	-0.07	1												
24	-0.02	0.07	-0.97	1											
25	0.04	-0.03	-0.01	0.02	1										
26	-0.04	0.02	0.15	-0.15	0.00	1									
27	-0.03	0.02	0.10	-0.10	0.00	0.92	1								
28	0.02	-0.09	0.05	-0.06	0.00	0.09	0.08	1							
29	-0.03	0.01	-0.15	0.15	-0.07	-0.07	-0.06	-0.17	1						
30	-0.03	0.15	-0.11	0.12	-0.04	-0.07	-0.04	-0.13	0.07	1					
31	0.05	0.01	-0.05	0.04	0.02	-0.04	-0.03	-0.05	0.02	0.05	1				
32	0.07	0.00	0.06	-0.05	0.01	-0.01	-0.01	0.06	-0.04	-0.07	-0.03	1			
33	0.08	0.04	0.12	-0.10	-0.03	0.13	0.10	0.07	-0.11	-0.07	-0.01	0.07	1		
34	-0.08	0.02	0.04	-0.04	-0.04	-0.01	-0.01	0.01	0.02	-0.02	0.02	0.32	0.01	1	
35	-0.07	0.08	-0.02	0.02	0.01	-0.01	-0.01	0.32	0.01	0.07	-0.02	-0.04	0.04	-0.01	1
36	-0.07	0.06	0.00	0.00	0.01	0.00	0.00	0.18	0.06	0.02	-0.01	-0.02	0.05	0.01	0.92

**Table 3-2: Time to Unicorn Status - Cox Proportion Hazard Model Regressions**

VARIABLES	(1) Coefficient	(2) Coefficient	(3) Coefficient	(4) Coefficient	(5) Coefficient
<b>Industry</b>					
Business Products and Services (B2B)	-0.237 (0.585)	-0.263 (0.548)	-0.281 (0.518)	-0.554** (0.006)	-0.562* (0.017)
Consumer Products and Services (B2C)	0.315 (0.467)	0.286 (0.513)	0.186 (0.669)	-0.447* (0.033)	-0.483* (0.038)
Energy	-0.496 (0.331)	-0.578 (0.268)	-0.572 (0.261)	-0.706* (0.029)	-0.841* (0.019)
Financial Services	-0.111 (0.801)	-0.154 (0.728)	-0.128 (0.772)	-0.656** (0.004)	-0.634** (0.009)
Healthcare	-0.221 (0.613)	-0.239 (0.580)	-0.268 (0.541)	-0.669*** (0.001)	-0.680** (0.001)
Information Technology	-0.083 (0.845)	-0.117 (0.786)	-0.175 (0.682)	-0.627*** (0.000)	-0.672*** (0.001)
<b>Founder/CEO Characteristics</b>					
Ivy School Affiliation		0.198* (0.040)			0.051 (0.710)
Elite School Affiliation		0.094 (0.287)			
Management background (MBA)		-0.042 (0.636)			
Expertise (PHD)		0.241* (0.045)			0.305** (0.008)
Medical background (MD)		-0.547* (0.028)			-0.497* (0.019)
Legal background (JD)		-0.023 (0.931)			
Technology background		-0.026 (0.684)			
Female Founder/CEO		-0.153 (0.401)			
Solo Founder		0.204+ (0.066)			0.342* (0.016)
<b>Venture Characteristics</b>					
Location in the Silicon Valley			0.014 (0.854)		
Location in the US			0.084 (0.286)		
Location in China			0.522*** (0.000)		0.437 (0.239)

Location in India				-0.290*	-0.066
				(0.031)	(0.636)
Accelerators				-0.023	
				(0.728)	
Profitability				1.083**	0.550
				(0.001)	(0.135)
Revenue				0.598+	0.489
				(0.065)	(0.126)
Platform Business Model				0.886**	0.918***
				(0.001)	(0.000)
Active Patents				0.014***	0.012**
				(0.000)	(0.002)
Pending Patents				-0.011*	-0.001
				(0.015)	(0.876)
<b>Investment Characteristics</b>					
Deal Size Amount (log)				0.882***	0.831***
				(0.000)	(0.000)
Percentage of VC Equity Ownership (log)				-0.757***	-0.732***
				(0.000)	(0.000)
Seed Funding				0.069	
				(0.372)	
Angel Investment				-0.132	
				(0.254)	
Corporate Venture Funding				-0.171	
				(0.388)	
Secondary Transaction				0.528***	0.549***
				(0.000)	(0.000)
Grant				0.062	
				(0.665)	
# Investors				0.026+	0.031*
				(0.063)	(0.020)
# New Investors				-0.038**	-0.041**
				(0.008)	(0.003)
Observations	5,320	5,320	5,320	2,878	2,878
N_fail	927	927	927	596	596
chi2	29.34	46.21	113.9	355.8	487.9
Log likelihood	-5669	-5661	-5621	-3123	-3105

Robust pval in parentheses, \*\*\* p<0.001, \*\* p<0.01, \* p<0.05, + p<0.1

**Internal factors.** Four of the nine variables are statistically significant in examining the associations between founder/CEO characteristics and time to reach unicorn status. The *Founder/CEO Ivy League affiliation* was positive and statistically significant ( $\beta=0.198$ ,  $p<0.05$ ), as was the *founder/CEO PhD degree* ( $\beta=0.241$ ,  $p<0.05$ ). While the *Solo Founder* variable ( $\beta =0.204$ ,  $p<0.1$ ) was also positive, it was only marginally significant. However, the *Founder/CEO Medical background* was negatively associated with scaling speed ( $\beta =-0.547$ ,  $p<0.05$ ). Such characteristics as *Founder/CEO Elite School Affiliation, Management, Legal background, and Gender* were not associated with the dependent variable.

Regarding venture characteristics, seven variables were significant concerning the time to reach unicorn status. While *Location in China* was positive and statistically significant ( $\beta =-0.522$ ,  $p<0.01$ ), *Location in India* was negatively significant ( $\beta =-0.290$ ,  $p<0.05$ ). The result indicates that China-based unicorn ventures take a shorter time, while India-based unicorn ventures take longer to reach unicorn status. The venture performance measured by variables *Profitability* ( $\beta =1.083$ ,  $p<0.01$ ) and *Revenue* ( $\beta =0.598$ ,  $p<0.1$ ) was both positive and statistically significant, suggesting that profitable ventures reach unicorn status in less time. *The Platform Business Model* variable was positive and statistically significant ( $\beta =0.886$ ,  $p<0.001$ ), suggesting that platforms achieve unicorn status faster than other business models. Although the *Active Patents* is positively significant ( $\beta =0.014$ ,  $p<0.001$ ), *Pending Patents* is negatively significant ( $\beta =-0.011$ ,  $p<0.05$ ), indicating that the active technological asset helps in scaling but not the pending technological asset. Other factors like *Location in the Silicon Valley or the U.S.* and *Accelerator program participation* had no significant statistical relationship to the time required to achieve unicorn status.

**External factors.** None of the industry sector variables was statistically significant to the time it took to reach unicorn status. However, five of the nine variables were found to be statistically significant regarding investment characteristics. Deal size amount was positive and statistically significant ( $\beta = 0.882$ ,  $p < 0.001$ ), while the percentage of VC equity ownership was negative and statistically significant ( $\beta = -0.757$ ,  $p < 0.001$ ). Thus, the more funding per investment deal, the less time was required to achieve unicorn status. Even so, a venture with a greater VC ownership stake per investment took longer to reach a billion-dollar valuation. The secondary transaction history is positively significant ( $\beta = 0.528$ ,  $p < 0.001$ ), meaning the unicorn venture with the secondary transaction history tends to scale faster. The numbers of investors and new investors show opposite results. Whereas the number of investors is positively significant ( $\beta = 0.026$ ,  $p < 0.1$ ), the number of new investors is negatively significant ( $\beta = -0.038$ ,  $p < 0.01$ ). The other variables including seed funding, angel investment, corporate venture funding, and a government grant, were not statistically significant.

### **3.6. Discussion and Limitations**

This exploratory chapter analyzes the factors influencing the speed to unicorn venture status with a global population of unicorn ventures. I divided two broad characteristics: internal (i.e., founder/CEO and venture characteristics) and external (i.e., industry, and investment characteristics) in order to evaluate the variables that impact speed to reaching unicorn status. Among many variables, this chapter identified a set of characteristics that influence scaling speed, validating the factors from the previous studies that impact venture growth or valuation and impact scaling speed to unicorn venture status. Given the study's exploratory nature, I chose a more comprehensive approach relative to prior studies to examine this phenomenon by assembling a unique and holistic dataset, and therein lies an essential contribution.

This chapter also contributes to the literature by examining novel factors related to founder/CEO, venture, and investment characteristics that have yet to receive research scrutiny. These factors represent newer phenomena in the rapidly growing technology-based entrepreneurship (Beckman, et al., 2012). The novel factors include specific knowledge expertise (PhD, MD, MBA, and JD degree), solo founding, locating outside the U.S., such as in China and India, affiliating with renowned accelerators, pursuing platform businesses, and receiving corporate venture funding, grant, and secondary transaction.

Regarding founder/CEO characteristics, I found that specific knowledge is associated with scaling speed. Interestingly, while a founder/CEO with a PhD degree tends to scale faster, a founder/CEO with a medical background tends to take longer. It shows that the discipline of specific knowledge differentially influences scaling speed. Perhaps this is due to the fit or relevance of expertise to the operation of the focal venture. The mixed result of specific knowledge requires further investigation. Interestingly, solo founders reached unicorn status more rapidly than ventures with multiple founders. To our surprise, 11% of the unicorn population consisted of solo founders. This was surprising since technology entrepreneurship is often viewed as a team activity (Schoonhoven and Romanelli, 2009), and a critical untested assumption is that teams are generally preferred over solo founders, especially regarding venture growth and scaling. With few exceptions (Greenberg and Mollick, 2018; Miloud *et al.*, 2012), research on solo founders and resource acquisition (or valuation) is relatively scarce.

Concerning the venture characteristics, the study found some evidence of different regional effects (Kwon and Sorenson, 2021; Saxenian, 1996a; Sorenson and Stuart, 2001). While the U.S., China, and India boast a significant number of unicorn ventures, owning more than 78% of the global unicorn venture population combined, each country has a different impact on

scaling speed. Contrary to our common understanding, I could not find the effect of location in the U.S. or Silicon Valley on the growth speed. Also, surprisingly, while Chinese ventures were faster to reach unicorn status compared to others, Indian unicorn ventures took longer to reach unicorn status. Considering this effect loses its significance in the full model, other factors could be mediating the link between nationality and speed to unicorn status, a finding that warrants additional research. In addition, I found a null effect of accelerator experience. Accelerators that attract and nurture early ventures to pursue entrepreneurial opportunities help ventures gain resources and customer traction more quickly (Cohen *et al.*, 2019). The null findings suggest that while accelerators serve as a conduit for nascent ventures to acquire financial resources in the very early stage, the accelerator affiliation is not associated with the growth speed. This finding suggests further examination of any boundary condition regarding the role of accelerators in venture scaling. Lastly, platform businesses took less time to reach unicorn status than other business models. This may be due to network effects implicit in the business model. However, other factors may mediate the relationship between the platform business model factor and the speed at which such ventures reach unicorn status suggesting that more research is needed to confirm this relationship.

Investment characteristics also provide an interesting avenue for discussion. I found null findings of corporate venture funding and governmental grant that supports the conditional effect of different types of funding (Park and Steensma, 2012). Corporate venture funding is likely to be conducive when the investing corporate is complementary to the venture's direction, having less relevance to the unicorn context. However, I found surprisingly a strong secondary transaction effect on venture scaling. While investors generally consider the secondary transaction as a negative signal for the entrepreneurial venture (Nadauld *et al.*, 2019), this may

not be the case for unicorn ventures. Perhaps the secondary transaction helps the unicorn ventures to gain access to financial and social capital with comparatively less or no cost. The buying investor that recently joined the investor group of unicorn venture will be more likely to have positive expectations toward the venture and more willing to help and support the operation than the selling investor. This finding requires further investigation.

This chapter is not without limitations. First, I was unable to distinguish between the founder/CEO's skills and background to isolate their independent impact on speed to unicorn status. Our dataset features numerous founders with management backgrounds (MBA degrees) yet lacking founding experience. The caveat is that founder/CEOs' educational background and degree may not capture the appropriate skills necessary to grow a unicorn venture. Second, the study does not examine national differences beyond the top three countries. The study can further improve by showing granular differences in the geographical region. Unicorn ventures are a ubiquitous phenomenon that reaches around the globe in both traditional cities (i.e., San Francisco, Beijing) and nascent "innovation hubs" (Bengaluru in India, Sao Paulo in Brazil, and Singapore) (The Economist, 2022). An avenue for future study might be a comparative study on different institutional, cultural, and regulatory environments across regions and cities.

#### **4. A BLESSING OR A CURSE? BEING A UNICORN VENTURE IN THE IPO MARKET**

“To these entrepreneurs, the IPO is proof they aren’t lunatics. They are finally able, at least temporarily, to stop protesting to family and friends that this work will make a difference and that they are sane despite having sacrificed everything for this chance.”

- Randy Komisar, *The Monk and the Riddle* (2000:1585)

##### **4.1. Abstract**

By examining a novel entrepreneurial phenomenon—the emergence of unicorn ventures—I investigate the discrepancies between theoretical assertions and empirical evidence in the initial public offering (IPO) underpricing of such ventures. Drawing on the “sociology of expectations” literature, I suggest that at IPO, unicorn ventures experience a greater level of IPO underpricing relative to other firms because of media uncertainty stemming from the high expectations surrounding the venture’s future performance. I tested the hypotheses using a unique hand-collected dataset that includes the entire population of unicorn IPOs between 2011 and 2018. I found that the media coverage (both the volume and tenor of such content) does not explain unicorn ventures’ significantly greater IPO underpricing relative to other ventures. However, the sentiment polarity of unicorn ventures in the media was positively associated with IPO underpricing. Also, pre-IPO profitability, and a legitimacy jolt experienced at a point in the study, moderated the relationship between sentimental polarity and IPO underpricing. I demonstrate how the sociology of expectations literature can provide a sound theoretical lens to explain the persistence of IPO underpricing beyond past explanations of this important

phenomenon.

## **4.2. Introduction**

New ventures (NVs) legitimation has attracted a wealth of studies in strategic management and entrepreneurship theory. In the literature, legitimacy refers to a judgment about an organization's acceptability, desirability, or appropriateness (Suchman, 1995). To date, studies in this area argued that stakeholders' or audiences' judgments of an NV's legitimacy are pivotal for the NVs to overcome their 'liability of newness' (Stinchcombe, 1965) and increase the chance of survival (Fisher *et al.*, 2016), and acquire the resources (Lounsbury and Glynn, 2001; Martens *et al.*, 2007).

Previous studies in NVs legitimation have generally assumed that the legitimacy judgment of the audiences is mainly similar and shared by broad audiences in the broader community (Überbacher, 2014). The literature regards audiences as theoretically and empirically collapsed into the aggregate concept of 'organizational environment' and does not distinguish the multi-perspective nature of audiences. In other words, the audiences in the literature have been assumed to be homogeneous and have monotonous perspectives. However, in reality, different audiences exist, and they may have different motives and approaches to evaluating venture projections. For example, in the media, what may seem risky and less realistic to the 'critics' of venture narratives may be radical innovation and creative prospects to some 'enthusiasts' who favor the nascent ventures' narratives. Such heterogeneous judgments and evaluations may influence the novel venture projections differently. Despite some recent studies attempting to understand diverse audiences' effects (Fisher, 2020; Fisher *et al.*, 2017), we still know little about how heterogeneous evaluation might affect venture legitimation and its consequences in the market.

This chapter of the study addresses the limitation of the past research by examining how heterogeneous audiences influence the legitimation of venture firms in the Initial Public Offering (IPO) context. Drawing from ‘sociology of expectations’ literature (Borup & *et al.*, 2006; Garud *et al.*, 2014b), I illustrate that support from a single audience group does not grant legitimacy but increases legitimacy uncertainty. It is because while high expectations from private investors project an imagined innovative future, the uncertainty associated with such a future may be high, a function of whether such grandiose expectations may be met. Lacking evidence of fulfilling such high expectations, unicorn ventures do not have support from other groups of stakeholders, which leads to higher uncertainty at IPO.

This chapter compares two groups of young firms, whether they received highly positive support from private investors or not. I also consider the firms’ media coverage and their sentiment polarity. The study analyzes unicorn ventures that have garnered high-growth private valuations of \$1 billion by suggesting innovative narratives for the highly-supported-by-investors firms. By doing so, this chapter seeks to answer the question: *how do heterogeneous audiences legitimate and influence market outcomes of venture firms at IPO?* The hypotheses are tested using a unique hand-collected dataset that includes the entire population of unicorn ventures IPOs between 2011 and 2018 and novel media-based measures to capture a heterogeneous evaluation in the media. As a result, the findings suggest that the more heterogeneous and greatly polarized sentiment unicorn ventures’ evaluations in the media, the less legitimation at IPO. I also found support for the moderating effects of pre-IPO profitability and an environmental jolt.

This chapter offers several contributions. First, this chapter attempts to understand how the sociocognitive properties that reflect a multi-dimensionality of audiences (private investors

and media) differentially influence market uncertainty at IPO. More specifically, I argue that if unicorn firms that have gained high support from private investors, mainly venture capitalists (VCs), receive polarized media exposure, they may be affiliated with higher perceived uncertainty at IPO. In other words, this chapter highlights a critical boundary condition for past theoretical explanations concerning media legitimation and its effect on market outcome (Kotlar *et al.*, 2018; Pollock and Rindova, 2003; Pollock *et al.*, 2008). Second, by drawing on the ‘sociology of expectations’ literature, this chapter provides: (a) an additional theoretical perspective to explain IPO market outcomes, especially concerning highly valued firms, and (b) a systematic, large-sample test of some of the theoretical explanations provided in this literature. I show how differing levels of expectations impact venture outcomes and how the sociology of expectations literature provides a useful theoretical lens to better explain the persistence of IPO underpricing beyond past explanations of this important phenomenon, at least for a select group of highly valued firms.

Third, this chapter highlights the adverse effects of high expectations at IPO. Although past studies have assumed that high expectations benefit firms by encouraging stakeholder support and raising greater financial capital (Garud and Giuliani, 2013; Lounsbury and Glynn, 2001; Martens *et al.*, 2007), I empirically show that this may not be the case during an IPO. Thus, the findings explain boundary conditions of high expectations by suggesting a nuanced relationship between expectations and the persistence of IPO pricing. This chapter suggests that the uncertainty accompanying high expectations is a major cause and identifies two moderators, profitability and legitimacy jolt, that trigger changes in venture uncertainty.

### **4.3. Theory and Hypothesis**

#### **4.3.1. Audience Diversity**

Previous studies acknowledged the importance of legitimacy for NVs (Überbacher, 2014). The new ventures attain and manage legitimacy in order to increase awareness in different life stages (Fisher *et al.*, 2016), survive and grow (Navis and Glynn, 2011; Zimmerman and Zeitz, 2002), and acquire and mobilize resources (Clough *et al.*, 2019; Lounsbury and Glynn, 2001). The studies commonly emphasize how important it is for NVs to establish legitimacy with their audiences and stakeholders such as media, suppliers, resource providers including angel investors and VCs, and customers.

However, previous studies have paid less attention to audience diversity. The lack of attention to the effect of audience diversity can be biased in understanding the business environments because the different audiences have distinctive, often conflicting, norms, beliefs, rules, and procedures for assessing ventures (Fisher *et al.*, 2017). Collapsing and aggregating audiences into a single dimension do not systematically reflect differing perceptions or evaluations of various audiences (Fisher, 2020; Überbacher, 2014).

Given the audience diversity, this chapter builds on the assumption that the media is an avenue for different social assessments of different audiences. Media not only produces information and shapes social realities but also indirectly impacts ventures by influencing the salience of stakeholders' assessment (Jonsson and Buhr, 2011). I consider the media as a mediating conduit for sociopolitical interplay between the different stakeholders and the focal venture. During the media's mediation process, nascent ventures in dominant positions or their followers will have more significant capabilities to raise counterarguments and make their different audiences less susceptible to alternative ideas. However, young ventures in less

dominant positions or their critics will have less power of say in the discourse of competing arguments. I attempt to understand the impact of media in this chapter.

#### **4.3.2. The Empirical Setting: Unicorn Ventures at IPO**

The emergence of unicorn ventures represents a new and interesting entrepreneurial phenomenon that has yet to attract significant academic scrutiny. Investors define unicorn ventures as startups that have garnered a billion dollars or more in valuation as private entities (e.g., Uber, Airbnb, Impossible Foods, Udemy, Magic Leap, BuzzFeed). As of March 2021, there were more than 480 unicorn firms worldwide with a total market valuation of about \$1.94 trillion.<sup>4</sup> By definition, unicorn ventures are rare, accounting for the top 1% of entrepreneurial ventures of those that have received a Series A round of venture capital (VC) funding. Given their growing media attention, entrepreneurs worldwide aspire to build a unicorn venture (Griffith and Primack, 2015). Although using a \$1 billion threshold to label a venture as a unicorn may seem arbitrary, joining the coveted unicorn venture club, according to Stewart Butterfield, CEO of Slack, “does make a difference psychologically because it’s the psychological threshold for potential customers, employees, and the press.”

Given the emergence of unicorn ventures as young firms are distinctive in two respects, which warrant more research attention. First, they garner a disproportionate amount of media attention, and also much of this media coverage is often positive. Second, the media treats such ventures akin to celebrity firms, meaning they “attract a high level of public attention and generate positive emotional responses from stakeholder audiences” (Rindova, Pollock, and Hayward, 2006; Zavyalova *et al.*, 2017). In general, media coverage is helpful to young ventures as it decreases information asymmetry between the firm and potential investors, notably when

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<sup>4</sup><https://www.cbinsights.com/research-unicorn-companies>

transforming into public entities via an initial public offering (IPO) (Bajo and Raimondo, 2017; Ritter and Welch, 2002). As numerous scholars have aptly noted, media attention at IPO increases a young firm's visibility and, more importantly, it enhances its legitimacy to the investors and the general public, especially when the sentiments expressed in the media about the firm are positive (Rindova *et al.*, 2007). Past research suggests that a reduction in information asymmetry between the firm and potential investors and or media-generated legitimacy should impact how share prices perform on the opening day of a firm's IPO, also known as IPO underpricing. IPO underpricing occurs when the closing price of a firm's shares on its first day of trading on a stock exchange is higher than its offering price at the start of the day (Ibbotson and Ritter, 1995).

#### **4.3.3. Information Asymmetry and Legitimacy**

Two research streams have examined the persistence of IPO underpricing. One stream suggests that the level of information asymmetry between retail investors and the firm seeking to go public influences how IPOs are priced (Rock, 1986). Lacking detailed information, retail investors can find it difficult to gauge the "true" firm value (Ljungqvist, 2007; Loughran and Ritter, 2004; Ritter, 2020; Wang and Wan, 2013). To compensate for uncertainty and the consequent risk investors are expected to bear, underwriters place the price of a firm's shares at a discount in order to attract participation in these IPOs.

In general, the availability of information about a firm, its actions, and performance should reduce the information asymmetry between potential retail investors and a venture seeking to go public. Information availability should enable potential investors to assess better a venture's offering price and the financial risk associated with investing in a particular IPO. In theory, this should reduce the need for underwriters to discount an offering to solicit retail

investor participation. Hanley and Hoberg (2010) found a higher volume of information in an IPO's prospectus led to more accuracy in terms of share price (i.e., less IPO underpricing) (Hanley and Hoberg, 2010). Heeley and colleagues (2007) showed that firms that provide information about how their technology and investments in R&D translate into value appropriation for the venture experienced less IPO underpricing on average (Heeley, Matusik, and Jain, 2007). Such studies highlight the pivotal role of information availability in IPO underpricing (Bajo and Raimondo, 2017; Daily *et al.*, 2003; Loughran and McDonald, 2013; Rock, 1986).

A second research stream has focused on the importance of legitimacy garnered by firms to explain IPO underpricing. Since IPO firms are relatively young, they lack operating histories and are thus viewed as less legitimate than established firms (Suchman, 1995; Tinic, 1988). Evidence indicates that as third-party intermediaries, media play a vital role in legitimizing young firms. Providing such evidence, Pollock and Rindova (2003) noted that “affecting the salience and perceived value of a firm, the media can be a powerful factor shaping the interpretative environments in which firms compete” (p. 640).

The media legitimize young firms by disseminating salient information about them (Hubbard, Pollock, and Pfarrer, 2016; Zavyalova *et al.*, 2017). Since potential retail investors have limited information about firms seeking to go public, their perceptions may be influenced by the media coverage firms receive. Media coverage generally increases a firm's visibility at IPO and directs investors' attention to its narrative. Research suggests that greater visibility can lead to familiarity and an IPO's appeal (Harrison, 1977; Zajonc, 1968). Media also engage in sensemaking activities; the positive media tenor (or sentiment) an IPO garners can influence how prospective investors view an IPO (Vanacker and Forbes, 2016; Vanacker *et al.*, 2019). In other

words, the level of media coverage and content influences IPO underpricing (Petkova *et al.*, 2013; Pollock and Rindova, 2003). Both theoretical streams provide evidence that the less information asymmetry between retail investors and a firm and the greater legitimacy garnered via media coverage and positive tenor may lead to less IPO underpricing.

Accordingly, the two research streams suggest that unicorn ventures should experience less IPO underpricing. Unicorn ventures garner significant media attention as a plethora of information sources provide general information about them. Therefore, given information availability, retail investors should experience lower levels of information asymmetry. Hence, an underwriter's need to discount their shares at IPO and entice retail investors to participate in the IPO should reduce. Indeed, a review of the Nexus Uni database between 2010 and 2019 indicates that unicorn ventures, between the founding to the date of their respective IPOs, received 30 times more media coverage than other VC-funded ventures: on average, a total of 450 media articles compared with 15 for high-growth VC-financed firms. Through greater media attention than counterpart IPO firms, the information about unicorn ventures is far readily available to investors, specifically retail investors.

The media favors this newsworthy group of firms and positively portrays them in the news, endowing them greater legitimacy than their counterparts. It often treats unicorn firms akin to celebrity firms, which are known to “attract a high level of public attention and generate positive emotional responses from stakeholder audiences” (Rindova *et al.*, 2006; Zavyalova *et al.*, 2017). The media covers unicorn ventures in greater detail by highlighting the founders' background, the stories behind the ventures, technologies that drive their competitive advantage, business models, and funding successes. Such coverage, coupled with the volume and the positive tenor, has enabled numerous unicorn ventures (e.g., Uber, Juul, and 23andMe) to

become household names. If the past research is a guide, this suggests that such media coverage (volume and positive tenor) provides greater legitimacy to unicorn ventures than their non-unicorn IPO counterparts. Hence, based on extant theoretical explanations, I propose the following baseline hypotheses:

*Baseline Hypothesis 1a: The volume of media-provided information prior to going public should more negatively impact a unicorn firm's shares on the opening day of trading relative to non-unicorn firms.*

*Baseline Hypothesis 1b: The proportion of media-provided information of positive tenor prior to going public should more negatively impact a unicorn firm's shares on the opening day of trading relative to non-unicorn firms.*

#### **4.3.4. Expectations and Uncertainty on Unicorn Ventures**

Information about unicorn ventures is readily available. Unicorn ventures, as a group, enjoy greater media attention and coverage and bask in the legitimacy that such coverage provides. Despite this, descriptive evidence suggests that unicorn firms experience greater IPO underpricing than non-unicorn ventures. Since the first unicorn IPO, LinkedIn, in 2011, the average IPO underpricing of US unicorns is 31.8%. In contrast, the entire population of IPO ventures underpricing between 1980 and 2019 was 18% and 14.8% between 2001 and 2019 (Ritter, 2020). Such descriptive evidence indicates that the previous studies fail to explain unicorn ventures' higher underpricing. Drawing from the sociology of expectations literature, I explore why this might be the case.

Unicorn ventures elicit high expectations, which attract positive media stories about them. Expectations are generally hypothetical descriptions of a future state along with the ventures' planned actions (Garud *et al.*, 2014b) and thus are "wishful enactments of a desired future" (Borup & *et al.*, 2006) that are realized when certain felicitous conditions occur (Garud, Gehman, and Giuliani, 2014a). With their novel narratives, unicorn ventures engender greater

expectations relative to others, as they convey an “imagined future” that is often grandiose.

To illustrate, here is a comparison between the narratives of a unicorn venture, Uber, and its counterpart, Via, a competitor. Uber’s vision statement promises “smarter transportation with fewer cars and greater access. Transportation that’s safer, cheaper, and more reliable; transportation that creates more job opportunities and higher incomes for drivers.” Uber expects to fundamentally transform the taxi industry. Their narratives describe how its vision translated to job opportunities and income from the numerous actors involved and signal a radical transformation of the social structure of transportation. Indeed, Uber is credited with accelerating the gig economy and changing the labor market via flexibility and worker protection issues. In other words, while the narratives for Uber are disruptive and often grandiose, Via’s are specific, localized, and practical.

Meanwhile, Via, the non-unicorn venture, offers the following: “We are building the transportation systems of tomorrow right now. We develop innovative mobility solutions for on-demand and pre-scheduled transit, powered by the world’s most advanced technology.” Via’s “imagined future” is more specific to its product, less about the transformation of the industry, jobs, or employees.

While high expectations about unicorn ventures attract a high volume of media coverage, they can be accompanied by uncertainty about whether the venture can fulfill its vision within a reasonable time and with limited resources. Previous studies show that conditions are often not met due to unexpected contingencies (Ansari and Garud, 2009) and that such uncertainties range from “technologies upon which the venture is based may not perform as projected, thereby challenging the very assumptions and ideas underpinning the venture. Relational ties may not work out as planned as suppliers and collaborators pursue their own strategies. Customer

preferences change even as they try out a venture's offerings" (Ansari and Garud, 2009; Garud *et al.*, 2014b).

To provide a foundation for understanding the mechanism of unicorn ventures' higher underpricing, I attend to the entrepreneurial narratives in the media in more detail. In the media, the probability of encountering felicitous conditions that fulfill a firm's narrative is always in doubt or at best, an open question, often hotly debated. The media watch for any deviations from the plan to fulfill the promised vision. Different types of media outlets create a diverse debate (Roulet and Clemente, 2018) in the sensemaking processes (Cornelissen and Clarke, 2010; Granqvist, Grodal, and Woolley, 2013). In so doing, media coverage of the venture becomes more intense and can evoke both positive and negative sentiments (Fiske and Taylor, 2013).

Given unicorns' grandiose expectations and the lingering uncertainties about whether their expectations can be fulfilled, media sentiments are often more polarized for these ventures relative to their non-unicorn counterparts. While positive coverage in the media may be related to dramatic expectations and innovative consequences, negative accounts include any risks, disappointments, and uncertainties. Therefore, I argue that the degree of polarization of sentiments about a unicorn venture narrative will amplify the uncertainty surrounding unicorn ventures, potentially undermining their legitimacy and leading to greater underpricing at IPO. I posit that unicorn ventures systematically experience more underpricing because of both high expectations and the uncertainty their narratives generate in media discourse.

*Hypothesis 2: The greater the polarized media sentiments about a unicorn venture prior to going public, the higher will be the market uncertainty at IPO.*

While the above discussion explains why unicorn ventures experience greater underpricing of their shares on the opening day of trading, I focus next on the factors that might moderate this main relationship between polarized sentiments unicorns experience and IPO

underpricing. I suggest two moderators: the first is venture profitability, and the second concerns legitimacy or an environmental jolt such as the one following the Theranos scandal, which raised doubts about unicorn ventures collectively.

#### **4.3.5. The Profitability of the Unicorn Ventures**

One critical milestone for any venture is achieving profitability. Until the dot-com bubble burst in the early 2000s, investors followed the mantra “get big fast” and ignored or underplayed the lack of ability to reach profitability measured by traditional accounting practices (Goldfarb, Kirsch, and Miller, 2007). Regardless of the opportunity costs, entrepreneurs at this time focused on the high upside potential of their ventures (Arora and Nandkumar, 2011). Such exuberance vanished in 2001 when the dot-com bubble burst. Following that era, ventures refocused their efforts on finding a path to profitability, as investors were reluctant to back ventures that lacked a business model which provided a clear path to profitability (Jain, Jayaraman, and Kini, 2008).

In the IPO context, achieving profitability is a first-order indicator of firm performance, a traditionally accepted indicator of the venture’s quality and legitimacy (Fisher *et al.*, 2016), and a quality signal for a firm contemplating going public (Belenzon, Chatterji, and Daley, 2020; Lungeanu and Zajac, 2016). It is also an indicator of substantial accomplishment and a proof point of a venture’s prospects (Hallen and Eisenhardt, 2012). Once a venture firm turns profitable, a portion of the uncertainty regarding its future prospects diminishes, enabling access to additional resources (Hallen, 2008; Sanders and Boivie, 2004).

I theorize that profitability promises more certainty *en route* to meeting expectations. While developing the plot in entrepreneurial narratives, unicorn ventures suggest a fundamental shift in the existing industry and business, promising greater returns in the future, as the Uber example provided earlier demonstrates. Since time and resources are required to realize the

future state that unicorn ventures pursue, they are seldom profitable at the time of IPO. Thus, profitability at IPO serves as a connecting link between the proposed storyline and actual progress. The linkage that profitability supports will directly benefit relevant stakeholders. Compared with non-unicorns, unicorns' profitability may be interpreted as much higher returns on investment for investors, career prospects for employees, and useful products/services for customers. By showing profitability, unicorn ventures provide evidence of concretely meeting their expectations, which in turn should affect how their shares fare on the opening day of trading.

I posit that profitability at the pre-IPO stage signal the possibility of fulfilling expectations, resulting in a reduction in uncertainty surrounding the venture. Profitability can establish plausibility by convincingly connecting currency to future expectations, justifying a venture's rate of progress. Potential investors may consider unicorn firms as less uncertain because they view the unicorn venture's profit as evidence of accomplishment, a sign of progress leading to the greater likelihood of fulfilling an imagined future. Thus, I expect a greater level of pre-IPO profitability will justify the lofty narrative and reduce uncertainty about expectations, resulting in a reduction in underpricing of shares at IPO.

*Hypothesis 3: A unicorn venture's ability to show profitability at the time of its IPO will positively moderate the relationship between unicorn venture status and its IPO underpricing.*

#### **4.3.6. Legitimacy Jolts for Unicorn Ventures**

Because early expectations are "wishful enactments of a desired future" (Borup Æ *et al.*, 2006),

they can only be realized when certain felicitous conditions materialize.<sup>5</sup> In practice, contingencies threatening ventures' plausibility can arise and create "legitimacy jolts" (Garud *et al.*, 2014b). A legitimacy jolt casts doubts on the expectations that ventures have proposed, which in turn can undermine their plausibility. Doubts about ventures' inability to meet expectations may draw media attention and impact the public discourse in the media, making it harder for ventures to attract the resources needed to fulfill such expectations. In certain cases, stakeholders may even withhold support following such a jolt. I focus on one such case—the highly publicized scandal surrounding pharmaceutical startup Theranos, which raised concerns about unicorn expectations in general and their lofty valuations in particular.

Theranos was a biopharmaceutical venture that promised an innovative blood testing device that could perform diagnostic tests for hundreds of diseases using a "single" blood drop. Elizabeth Holmes, the company's mercurial founder, and a Stanford University dropout, painted a grandiose vision of more accessible and less costly diagnostic tests using her soon-to-be-manufactured devices. Her lofty idea of conducting hundreds of diagnostic tests using a single drop of blood captured investors' imaginations and helped her raise over \$900 million in VC funds. Investors valued Theranos at \$9 billion, making it one of the most widely discussed unicorn ventures of the 2010s. In addition to interest in the proposed testing device, the founding background of the firm and the founder's vision received significant media visibility, coverage, and numerous accolades.

Unable to deliver on her vision and the subsequent efforts she and her co-founder took to mislead the public (and their joint venture partners) resulted in a significant media backlash. The

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<sup>5</sup>These include technologies that have yet to be commercialized, regulations that favor a service or product, the ability to attract relevant stakeholders and customers willing to pay for the services or products (Garud, Gehman, and Giuliani, 2014a).

ensuing scandal resulted in multiple lawsuits involving investors and partners such as Walgreen. In 2014 the Securities and Exchange Committee opened an investigation into “an elaborate, years-long fraud” that Theranos perpetuated. In 2015, Theranos ceased operations, and the founder is now embroiled in multiple ongoing lawsuits.

Such a highly publicized scandal can affect those who pursue an IPO, as it has heightened skepticism about the grandiose expectations surrounding all unicorn ventures. Post-scandal, unicorn IPOs encountered greater investor skepticism and uncertainty, requiring underwriters to compensate investors for bearing the risks by providing a discount. Hence, I posit

*Hypothesis 4: A scandal relevant to unicorn ventures will increase IPO underpricing for a unicorn venture.*

Two research streams provide theoretical explanations for the persistence of IPO underpricing, a topic of immense interest to management scholars focusing on entrepreneurial finance and strategy. One theoretical explanation draws on the information asymmetry arguments to explain the persistence of IPO underpricing (Bajo and Raimondo, 2017; Ritter and Welch, 2002). Distinguishing between professional investors (institutional investors) and retail investors (the general public), researchers from this stream posit that professional investors (i.e., institutional) are privy to more information regarding IPOs than other investors (i.e., retail or unsophisticated investors). Moreover, much firm-provided information in S-1 documents and amendments that use sophisticated terminology and language primarily targets professional investors, not retail investors. Given this information asymmetry, retail investors are often uncertain about the “true” price of a firm’s shares at IPO. To compensate for this uncertainty (and the risk that it entails) and entice retail investors to participate in the IPO, underwriters generally discount the price of shares at the IPO (Rock, 1986).

The second set of theoretical arguments for the persistence of IPO underpricing draws on

the concept of legitimacy (Fiol & Aldrich, 1994; Suchman, 1995; Tinic, 1988.). This research stream highlights the importance of the information from the *third-party intermediaries*, primarily the media, provided to the public regarding firms seeking an IPO. As a third-party intermediary, the media confer legitimacy to new ventures seeking to go public (Pollock and Rindova, 2003; Pollock *et al.*, 2008). When the media covers an IPO firm extensively, such exposure helps increase its familiarity and liking among retail investors, which in turn legitimizes the new venture. Pollock and Rindova (2003), one of the key proponents of this perspective, suggest that media narratives serve as “stimuli that affect the formation of investors’ impression of firms” (p. 631). Greater media coverage legitimizes IPO firms for investors, decreasing the need to use underpricing to entice their participation in IPOs. Although the explanations differ in their theoretical underpinnings, both stress the critical role the availability of information influences IPO underpricing.

While a preponderance of evidence suggests that this is true of most ventures that pursue IPOs, this does not seem the case with unicorn ventures. Preliminary evidence suggests that the two IPO underpricing theories noted above may not fully explain the greater price discount unicorn ventures experience at IPO. Descriptive evidence suggests that unicorn ventures experience more IPO underpricing relative to other ventures seeking to become public entities. To illustrate, since 2001, U.S. IPOs have been underpriced by 14.8% (Loughran and Ritter, 2004; Ritter, 2020). Notably, unicorn ventures experience IPO underpricing at more than double that amount, 31.8% on average. This is significant despite the fact that unicorn ventures garner greater media attention, they have been extensively discussed in the media, and much of the sentiments expressed about them are positive in the media. Interestingly, even with less information asymmetry (given the availability of information) and greater media accorded

legitimacy, IPO underpricing is higher for unicorn ventures than a non-unicorn. In other words, descriptive evidence suggests that past theoretical explanations for the persistence of IPO underpricing are rather limited.

To address this discrepancy, I examine why unicorn ventures experience greater IPO underpricing than non-unicorn firms. Since the theoretical explanations discussed above are limited, I draw on the “sociology of expectations” literature (Borup & *et al.*, 2006; Garud *et al.*, 2014b) to argue that unicorn ventures experience greater IPO underpricing than their non-unicorn counterparts due to the significant expectations and uncertainty that stems from entrepreneurial narratives they provide. The entrepreneurial narratives are stories about entrepreneurs that help define a new venture in ways that can lead to favorable interpretations of the venture’s wealth-creating possibilities (Garud and Giuliani, 2013; Lounsbury and Glynn, 2001; Martens *et al.*, 2007). While high expectations project an imagined innovative future, the uncertainty associated with such a future may be high, a function of whether such grandiose expectations may be met. Lacking evidence of fulfilling such high expectations, unicorn ventures may undergo greater levels of underpricing at IPO.

I tested the hypotheses using a unique hand-collected dataset that includes the entire population of unicorn IPOs between 2011 and 2018. Contrary to past research, I found that the media coverage (both the volume of coverage and tenor of such coverage) does not explain unicorn ventures’ significantly greater IPO underpricing relative to other ventures. Instead, the result shows that the sentiment polarity of unicorn ventures in the media is positively associated with IPO underpricing. Also, I found support for the moderating effects of pre-IPO profitability (i.e., partial evidence of meeting expectations) and an environmental jolt on IPO underpricing.

This chapter offers several important contributions. First, although past theoretical

explanations help predict IPO underpricing for “average” IPO firms, these explanations are less useful in the case of highly valued firms such as unicorn ventures. In other words, this chapter highlights an important boundary condition for past theoretical explanations concerning IPO underpricing (Kotlar et al., 2018; Loughran & Ritter, 2004; Pollock and Rindova, 2003; Ritter, 2020). Second, by drawing on the ‘sociology of expectations’ literature, this research provides: (a) an additional theoretical perspective to explain the persistence of IPO underpricing, especially concerning highly valued firms, and (b) a systematic, large-sample test of some of the theoretical explanations provided in this literature. I show how differing levels of expectations impact venture outcomes and how the sociology of expectations literature provides a useful theoretical lens to better explain the persistence of IPO underpricing beyond past explanations of this important phenomenon, at least for a select group of highly valued firms.

Third, this chapter highlights the adverse effects of high expectations on IPO underpricing. Although past studies have assumed that high expectations benefit firms by encouraging legitimacy and stakeholder support (Garud and Giuliani, 2013; Lounsbury and Glynn, 2001), the study empirically shows that this may not be the case during an IPO. Thus, the findings explain boundary conditions of high expectations by suggesting a nuanced relationship between expectations and the persistence of IPO pricing. I suggest that the uncertainty accompanying high expectations is a major cause and identify two moderators, profitability and legitimacy jolt, that trigger changes in venture uncertainty.

## **4.4. Methods**

### **4.4.1. Sample**

To test the hypotheses, I compiled unique data of all high technology IPOs, including unicorn ventures, from Thomson Financial Securities and Data Corporation (SDC) New Issues database

between 2011 and 2018 through an initial public offering on the New York Stock Exchange (NYSE) and NASDAQ. I chose a period following 2011 because this was when unicorn firms started to become public entities, beginning with LinkedIn in 2011. I used the Nexus Uni database to collect media-relevant data.

I excluded firms that had lower than \$100 million pre-IPO valuations, non-technology firms, leveraged buyouts, closed-end mutual funds, real estate investment trusts (REITs), and special purpose vehicles (SPVs) in order to focus on comparable stock issuance of venture firms (Loughran and McDonald, 2013; Park, Borah, and Kotha, 2016). Our final sample size was 226 firms, including 38 unicorn IPO firms.

#### **4.4.2. Dependent and Independent Variables**

The dependent variable is *IPO underpricing*, the percent change in the price of a stock at the end of the first day of official trading on the stock exchange, specifically the official closing price on the first day divided by the offer price (Kotlar *et al.*, 2018; Ritter and Welch, 2002).

$$\text{IPO Underpricing} = \left[ \frac{(\text{Price}_{\text{end}} - \text{Price}_{\text{offered}})}{\text{Price}_{\text{offered}}} \right] \times 100$$

Our independent variable of primary interest is the *unicorn*, a binary variable; I assigned a value of 1 if the IPO firm was labeled a unicorn venture and zero otherwise. I identified 38 unicorn firms that went public during this timeframe from *The Wall Street Journal's* "The Billion Dollar Startup Club" and CB Insights' "Global Unicorn Club." I cross-checked this list with valuation data collected from Pitchbook.

For our baseline hypotheses, I used *volume* and *tenor of media* as moderating variables. Following previous studies (Pollock and Rindova, 2003; Pollock *et al.*, 2008), I measured the volume of media as the total number of news articles in the pre-IPO stage. I also measured the tenor of media using the Janis-Fader coefficient of imbalance (Pollock and Rindova, 2003). The

tenor measure is calculated as:

$$\text{Tenor} = (P^2 - PN) / V^2 \text{ if } P > N; 0 \text{ if } P = N, \text{ and } (PN - N^2) / V^2 \text{ if } N > P$$

Where P is the number of articles about a venture that has a positive coefficient from LIWC sentiment analysis, N is the number of articles about the venture that has a negative coefficient from LIWC sentiment analysis, and V is the total volume of articles about the venture.

To test our posited mechanism, I used the *Media sentiment polarity* variable from the textual analysis of media coverage about a target firm. I retrieved all news articles of firms between their founding date and IPO date, excluding duplicates. I used text-analysis software Linguistic Inquiry and Word Count (LIWC) to measure the sentiment of media coverage. Based on the positive and negative sentiment measures, I created Blau's heterogeneity index (Blau, 1977), where zero value indicates no polarity and 100 indicates extreme polarity.

To assess our moderation hypotheses, I used two variables: *profitability* and *post-scandal*. First, I operationalized *profitability* as the annual net income before IPO (Masulis, Pham, and Zein, 2017). As Hypothesis 3 shows, a highly profitable firm before IPO may lead to less underpricing. Second, I measured our *post-scandal* variable as the binary dummy variable, using timing pertaining to the Theranos scandal (Garud *et al.*, 2014b). I assigned a value of 1 if the IPO occurred after April 2014 and zero beforehand. I used this variable to test Hypothesis 4.

#### **4.4.3. Control Variables**

I included relevant control variables that past studies have shown to influence IPO underpricing.

**Hot market.** Market conditions can impact IPO underpricing at the time of IPO. In a hot market, irrationally exuberant investors may influence pricing resulting in higher offer prices and lower underpricing (Derrien, 2005; Ljungqvist, Nanda, and Singh, 2006). Following (Heeley *et*

*al.*, 2007), I operationalized whether the market was “hot” by counting the number of IPOs at the industry level for each industry in our sample.

***Firm age and size.*** Firm age and size are an essential measures in any uncertainty or information asymmetry mechanism of IPO underpricing (Kotlar *et al.*, 2018; Loughran and Ritter, 2004). I measured firm age as the total number of years since the venture founding year and firm size as the total number of employees at the time of IPO.

***Total assets.*** I expect firm-level assets would be associated with underpricing (Kotlar *et al.*, 2018). I operationalized the *total assets* variable as the natural logarithm of the total assets of a firm prior to IPO.

***Share overhang.*** Share overhang indicates the proportion of unsold outstanding shares. Research suggests that share overhang may positively impact underpricing (Bradley and Jordan, 2002). The more shares retained at IPO, the more wealth there is for non-selling shareholders, and in turn, less wealth left for new investors. A more significant share overhang will likely increase underpricing to incentivize new investors. I operationalized share overhang by measuring the number of shares a venture retained divided by primary shares sold at IPO.

***Pre IPO valuation.*** Following previous studies (Stuart *et al.*, 1999), I controlled for Pre IPO valuation to capture the valuation effect, which is different from the unicorn effect. I intended to capture the impact of having a unicorn label in addition to the valuation effect, i.e., the \$1B valuation mark (Stuart *et al.*, 1999). I measured the pre-IPO valuation as the post-money valuation of the latest private funding round before IPO.

***Investor size.*** I control lead institutional investor size because more prominent institutional investors are more likely to be long-term investors, suggesting positive signals about the venture’s quality and legitimacy (Pollock and Rindova, 2003; Sanders and Boivie, 2004). To

control for this possibility, I measured the investor size as the total investment size of institutional investors during the first quarter of the IPO, calculated by the number of shares for each institutional investor multiplied by the stock price. I collected the variable from Thomson Reuters 13(f) database.

***Underwriter reputation.*** Since the underwriter market functions like an oligopoly, firms in this marketplace compete intensely (Cohen and Dean, 2005; Kotlar *et al.*, 2018; Liu and Ritter, 2011; Park *et al.*, 2016). That is, the better the underwriter's reputation the more positive signal is to the market. To control for the underwriter reputation effect, I follow Loughran and Ritter (2004) and use the 2015 reputation scores compiled and made available on Jay Ritter's web page. I took the maximum value of underwriters' reputations in the case of multiple underwriters.

***VC Backed.*** Garnering VC funding can affect underpricing (Bradley, Kim, and Krigman, 2015; Lee and Wahal, 2004; Sanders and Boivie, 2004). VC investments signal other investors, particularly in pre-investment screening, sophisticated contracting, and post-investment monitoring and advising (Gompers *et al.*, 2019). I used a dummy to operationalize this variable and assigned a value of 1 to VC-backed firms and zero otherwise.

***Overpricing.*** Studies have found that the change of any upward price from the offering price can impact the pricing at the time of IPO (Kerins, Kutsuna, and Smith, 2007; Pollock and Rindova, 2003). Firms change their offering prices due to a higher demand than expected (Hanley, 1993). Because of this, shares open at a higher offering price, leading to a lower degree of underpricing. I operationalized the change of an upward price on the offering price by measuring overpricing at 1 if the offer price is higher than the midpoint of the price range and zero otherwise.

**Risk factors.** A firm's risk can affect the degree of underpricing at IPO (Arthurs *et al.*, 2008; Certo *et al.*, 2001; Park *et al.*, 2016). Thus, I control for the possibility by counting the number of risk factors listed in a firm's S-1 document.

**Year and Industry.** I control IPO year using a year fixed effects model and add industry control variables by creating dummy variables for all industries (Judge *et al.*, 2015).

#### 4.4.4. Estimation Approach

To estimate how unicorn labeling affects underpricing, I use the following model:

$$Y = \alpha + \beta_1 UM + X_\gamma + \varepsilon,$$

where Y represents the underpricing measure, U is an independent variable, a unicorn venture variable, and M is a set of variables that are *media sentiment polarity*, *profitability*, and *scandal*.  $X_\gamma$  is a vector of control variables.

**Two-Stage Equations.** Although I included fixed effects for industry and IPO year to control for potential impact from time-invariant unobservable heterogeneity, I recognize the possibility of bias caused by omitted endogenous firm factors. The critical issue of omitted variable bias may stem from potential correlations among the omitted variable, unicorn firm dummy variable, and IPO underpricing. If the unobserved factor correlates with both independent and dependent variables, our models and results could be biased (Certo *et al.*, 2016; Heckman, 2013). I attempt to address such bias issues using Heckman's two-stage least squares (2SLS) model.

In the first stage, I used a probit model to estimate being labeled a unicorn firm. Since the validity of the instrumental variable is pivotal to producing reliable results (Certo *et al.*, 2016; Chang, Kogut, and Yang, 2016; Hamilton and Nickerson, 2003), we relied on the variable that

may affect unicorn labeling, assuming the unicorn variable is a function of plausible exogenous instruments. Following previous studies, I chose as the instrumental variable *location in SV*, which indicates whether a firm's headquarters is located in Silicon Valley (coded as 1 if the headquarters location is in northern California—San Francisco, Mountain View, San Jose, Palo Alto—and zero otherwise). I believe this is a valid instrument since locating a venture in SV may affect venture financing intentions but have minimal influence on IPO underpricing (Pollock & Rindova, 2003), giving the firm greater access to VC compared to other locations. Locating in SV may also lead to influence from other rapidly growing firms that are nearby (Saxenian, 1996). I found that location did not directly influence IPO underpricing included in the second stage, showing evidence of exclusion restriction (please see Appendix A for the results).

I included four variables in the first stage as controls that may increase the likelihood of becoming a unicorn: total count of media articles, firm age, firm size, and pre-IPO valuation. I believe pre-IPO valuation in the model will help capture a socially constructed value of unicorn ventures for more than the arbitrary \$1B mark (Stuart *et al.*, 1999). I also included the *media articles* variable since unicorn firms garner media attention akin to celebrity firms (Hubbard *et al.*, 2018; Pfarrer, Pollock, and Rindova, 2010; Rindova *et al.*, 2006). I calculated inverse Mill's ratio from this stage to include in the second stage.

During the second stage, I attempted to estimate the extent to which the unicorn firms were likely to be underpriced. In order to observe exclusion restrictions, I included variables including lambda representing the Mill's ratio, the selection parameter, and control variables. Empirically, I found all exclusion restrictions to be significant predictors of the unicorn label.

I also tested the validity of the instrumental variable. A weak instrumental variable can cause bias in coefficients and confidence intervals (Semadeni, Withers, and Trevis Certo, 2014).

Thus, weak identification is essential since it arises when the instrument variable, a location in SV, is correlated with underpricing. I analyzed the F-test using the `testparm` command in Stata at the first stage. The result of F statistics is 10.22 ( $p < 0.001$ ). Because F statistics greater than ten are considered a strong instrument, I can say that the instrument variable is reliable (Wolfolds and Siegel, 2019).

## **4.5. Results**

### **4.5.1. Descriptive Statistics**

Table 4.1 presents the descriptive statistics and correlations for the variables. The average underpricing in our sample firms was 27.8%. Since the number of unicorn firms in the sample is 38, these represent a total of 17%. The average age of the firm at IPO is 9.67 years. Table 4.2 presents the first stage probit regression analysis. The first stage result shows three of the five variables used are statistically significant, suggesting that the relevance assumption holds in the first stage.

### **4.5.2. Regression Results**

Table 4.3 presents the second stage results of our analyses. Here, Model 1 tests baseline hypotheses, which posit that volume (H1a) and proportion of positive tenor of media (H1b) about unicorn ventures are negatively associated with IPO underpricing. I find that while the ‘volume of media coverage’ variable is negatively associated with the underpricing and marginally significant at  $p < 0.1$ , the ‘positive tenor’ variable is not statistically significant. These results are consistent with the previous studies that Pollock and Rindova (2003) provide. Also, the examination of the interaction terms in Model 1 provides no support for either H1a or H1b, indicating that the previous assertions do not fully capture or help explain unicorn ventures’ greater underpricing relative to their non-unicorn counterparts.

**Table 4-1: Descriptive Statistics**

Variable	N	Mean	SD.	Min	Max	1	2	3	4	5	6
1 Underpricing	226	27.8	35.0	-27.5	206.7	1.00					
2 Unicorn	226	0.2	0.4	0	1	0.05	1.00				
3 Firm Age	226	9.7	5.3	1	41	-0.02	-0.04	1.00			
4 Firm size	226	879.1	2598.2	4	34081	-0.02	0.37	0.12	1.00		
5 Hot market	226	9.4	6.9	1	23	0.13	-0.09	-0.06	0.01	1.00	
6 Total assets (log)	226	5.4	1.0	3.8	10.6	0.10	0.62	0.08	0.59	-0.08	1.00
7 Net income	226	-30.0	359.0	-3445.1	3913.7	0.02	-0.08	0.12	0.55	0.05	0.10
8 Share overhang	226	5.0	3.4	1.0	36.1	0.17	0.08	-0.09	0.02	-0.01	0.18
9 Media Attention	226	88.1	549.0	0	7186	0.08	0.30	-0.02	0.20	-0.07	0.26
10 Pre IPO valuation	226	1835.5	10650.9	100.5	145850	0.02	0.27	0.05	0.86	0.03	0.52
11 Underwriter reputation	226	8.5	0.7	4.0	9.0	0.05	0.29	-0.04	0.16	-0.03	0.40
12 VC backed	226	1.0	0.2	0	1	0.09	-0.15	-0.17	-0.11	-0.04	-0.20
13 Overpricing	226	0.5	0.5	0	1	0.34	0.22	-0.08	0.13	0.13	0.38
14 Risk factors	226	100.9	52.7	17	230	0.04	-0.18	-0.16	-0.15	0.25	-0.21
15 Location in the Silicon Valley	226	0.2	0.4	0	1	-0.04	0.27	-0.05	0.00	-0.18	0.20
16 Sentiment Polarity	226	0.9	0.1	0.5	1.0	-0.01	0.01	-0.11	0.03	-0.10	0.01
17 Post Scandal	226	0.1	0.4	0	1	-0.10	0.47	0.05	0.07	-0.24	0.16
	7	8	9	10	11	12	13	14	15	16	17
8 Share overhang	-0.07	1.00									
9 Media Attention	0.02	0.16	1.00								
10 Pre IPO valuation	0.66	-0.04	0.24	1.00							
11 Underwriter reputation	-0.01	0.16	0.10	0.10	1.00						
12 VC backed	-0.03	0.08	0.02	-0.01	-0.09	1.00					
13 Overpricing	-0.01	0.14	0.08	0.12	0.25	0.08	1.00				
14 Risk factors	-0.07	-0.11	-0.10	-0.07	-0.21	0.08	-0.19	1.00			
15 Location in the Silicon Valley	-0.05	0.19	0.04	-0.02	0.21	0.00	0.08	-0.17	1.00		
16 Sentiment Polarity	-0.01	0.05	0.00	0.05	0.01	0.13	0.03	0.11	-0.03	1.00	
17 Post Scandal	-0.15	-0.14	-0.03	-0.02	0.12	-0.12	0.00	0.07	0.10	0.07	1.00

**Table 4-2: First-Stage Probit Regression Results**

	Unicorn venture
Volume of Media	0.001 (0.001)
Location in Silicon Valley	0.790*** (0.247)
Firm Age	-0.044 (0.028)
Firm Size	0.000** (0.000)
Pre-IPO Valuation	0.000** (0.000)
Constant	-1.725*** (0.258)
N	226
F-statistic	10.22
Log-likelihood	-56.91
Chi 2	36.67
Pseudo R-squared	0.44

Interestingly, as our descriptive results suggested, the unicorn dummy variable is positively associated with IPO underpricing, and the effect is statistically significant ( $\beta = 19.815$ ,  $p < 0.05$ ). In other words, unicorn ventures exhibit greater underpricing than non-unicorns, even after controlling for various factors that have been shown to influence IPO underpricing in past studies. Unicorn ventures are underpriced by 44.3%, and non-unicorns are underpriced by 24.4%. Considering that the average capital raised is \$675 million, the average amount of cash

left on the table for unicorns is \$208 million, while that of non-unicorns is \$132 million. Figure 1 illustrates the underpricing of unicorn ventures.

Hypothesis 2 tests the mechanism of unicorn ventures' underpricing. Hypothesis 2 posits media sentiment polarity of high expectations about unicorn ventures will positively affect underpricing. In Model 3, the interaction variable *Media sentiment polarity x Unicorn Ventures* is positively related to underpricing ( $\beta = 1.416, p = 0.053$ ). The result suggests that the higher the level of polarity expressed by the media, the greater the IPO underpricing of unicorn ventures relative to non-unicorns. Specific results show that one standard deviation increase of uncertainty leads to an approximately 0.88% increase in underpricing (Figure 2). Considering that the average capital raised by unicorn firms at IPO is \$3 billion, one standard deviation increase in uncertainty will decrease the net cash raised by \$26 million for unicorn ventures. Thus, the results claim support for Hypothesis 2.

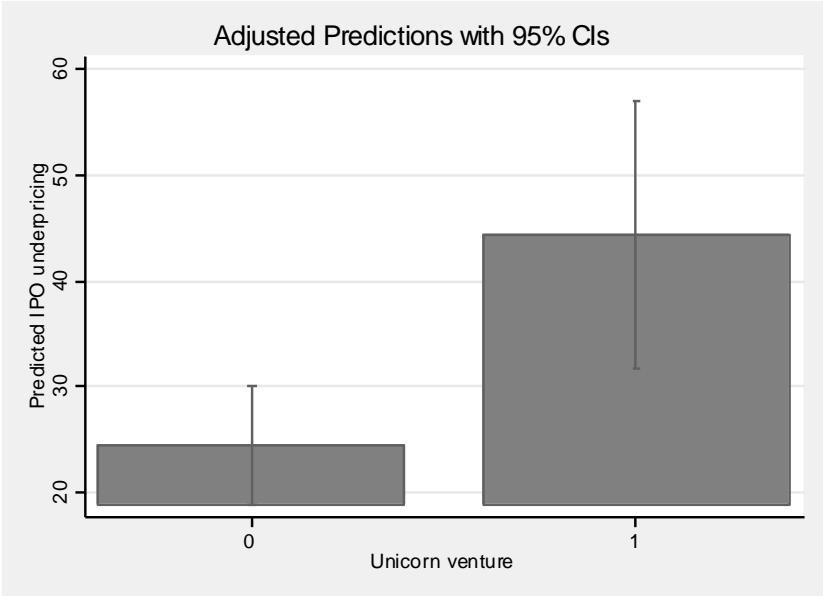
Hypothesis 3 posits that unicorn venture profitability will negatively moderate the relationship between unicorn firms and underpricing. Model 4 shows the interaction effect between profitability and the unicorn dummy. The primary association between net income and underpricing is negatively significant ( $\beta = -0.069, p < 0.05$ ), and the interaction result are also significant ( $\beta = 0.079, p < 0.05$ ), indicating that profitable unicorn firms are less likely to be underpriced. A \$100 million increase in net income for unicorn firms will help them raise \$141.8 million more at IPO. Figure 3 illustrates the evidence of support for Hypothesis 3.

**Table 4-3: 2SLS Regression Results**

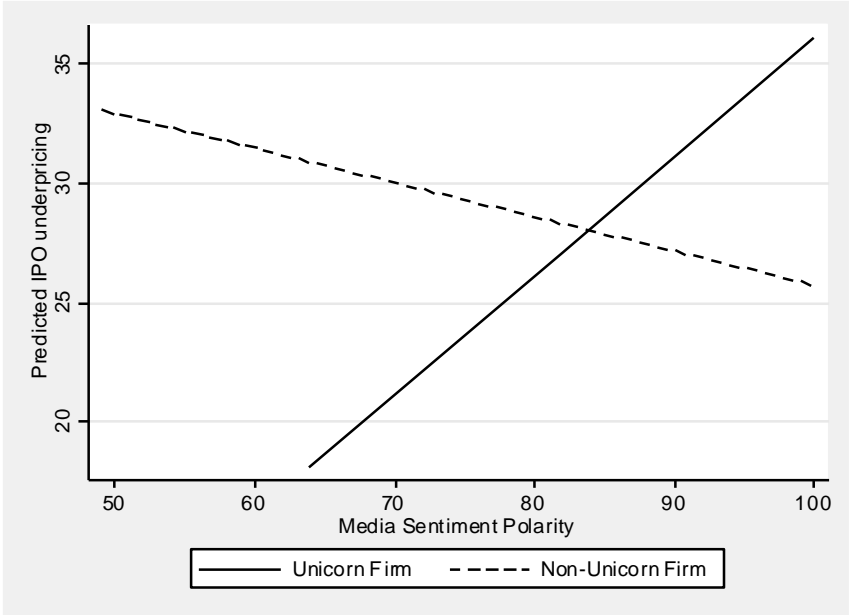
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Hot Market	0.176 (0.478)	0.098 (0.464)	-0.003 (0.466)	0.157 (0.467)	0.067 (0.467)	0.037 (0.471)
Firm Age	0.554 (0.402)	0.458 (0.391)	0.489 (0.394)	0.475 (0.400)	0.422 (0.398)	0.453 (0.412)
Firm Size	-0.003* (0.002)	-0.003* (0.002)	-0.003** (0.002)	-0.003** (0.002)	-0.003* (0.001)	-0.004** (0.002)
Total Assets (log)	1.400 (5.647)	1.413 (5.632)	1.376 (5.605)	2.493 (5.593)	1.095 (5.717)	2.378 (5.646)
Net Income	0.007 (0.006)	0.006 (0.005)	0.007 (0.005)	-0.069** (0.034)	0.006 (0.005)	-0.077** (0.035)
Share overhang	1.078 (0.785)	0.943 (0.744)	1.143 (0.794)	0.800 (0.695)	0.987 (0.766)	1.020 (0.748)
Pre-IPO Valuation	0.001 (0.003)	0.001 (0.003)	0.000 (0.003)	0.003 (0.003)	0.002 (0.003)	0.003 (0.004)
Investor Size	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Underwriter Reputation	0.589 (5.804)	0.176 (5.752)	0.187 (5.819)	-0.121 (5.759)	0.426 (5.796)	0.159 (5.888)
VC backed	15.358* (8.746)	15.050* (8.595)	12.323 (9.387)	9.816 (8.647)	14.650* (8.679)	6.507 (9.564)
Overpricing	23.905*** (5.751)	24.355*** (5.710)	25.324*** (5.659)	23.532*** (5.620)	24.116*** (5.740)	24.070*** (5.580)
Risk Factor	-0.039 (0.078)	-0.036 (0.077)	-0.028 (0.078)	-0.051 (0.075)	-0.033 (0.077)	-0.042 (0.075)
Inverse Mills Ratio	0.849 (7.864)	1.026 (7.643)	-0.438 (7.575)	1.050 (7.695)	0.870 (7.641)	-0.448 (7.645)
Volume of Media	-0.032* (0.016)	-0.013*** (0.005)	-0.013*** (0.005)	-0.013*** (0.005)	-0.012** (0.005)	-0.013*** (0.005)
Positive Tenor of Media	-0.008 (0.058)	-0.013 (0.055)	-0.009 (0.056)	-0.008 (0.055)	-0.010 (0.056)	-0.002 (0.056)
Unicorn Venture	19.719** (9.537)	19.815** (7.727)	-109.422 (68.290)	17.626** (8.107)	15.196* (8.393)	-107.792 (68.194)
Volume of Media × Unicorn Venture	0.020 (0.017)					
Positive Tenor of Media × Unicorn Venture	-0.029					
Media sentiment polarity			-0.376 (0.328)			-0.410 (0.329)
Media sentiment polarity × Unicorn Venture			1.416* (0.732)			1.328* (0.732)
Net Income × Unicorn Venture				0.079** (0.035)		0.088** (0.036)
Post Scandal					11.076 (8.287)	15.014* (8.162)
Post Scandal × Unicorn Venture					20.244* (11.855)	15.675 (12.220)
Constant	-30.048 (59.416)	-31.820 (60.135)	5.553 (63.179)	-30.286 (59.835)	-31.754 (60.692)	8.895 (63.526)
IPO Year FE	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y
N	226	226	226	226	226	226
R <sup>2</sup>	0.26	0.28	0.29	0.29	0.28	0.30
Adjusted R <sup>2</sup>	0.16	0.17	0.17	0.18	0.17	0.18

\*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

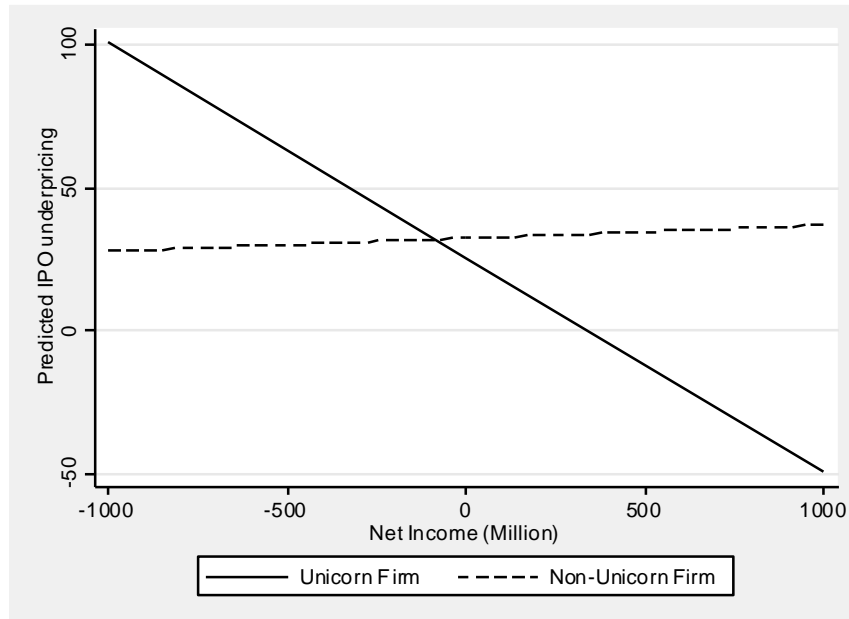
**Figure 4-1: Effect of Unicorn Venture Underpricing**



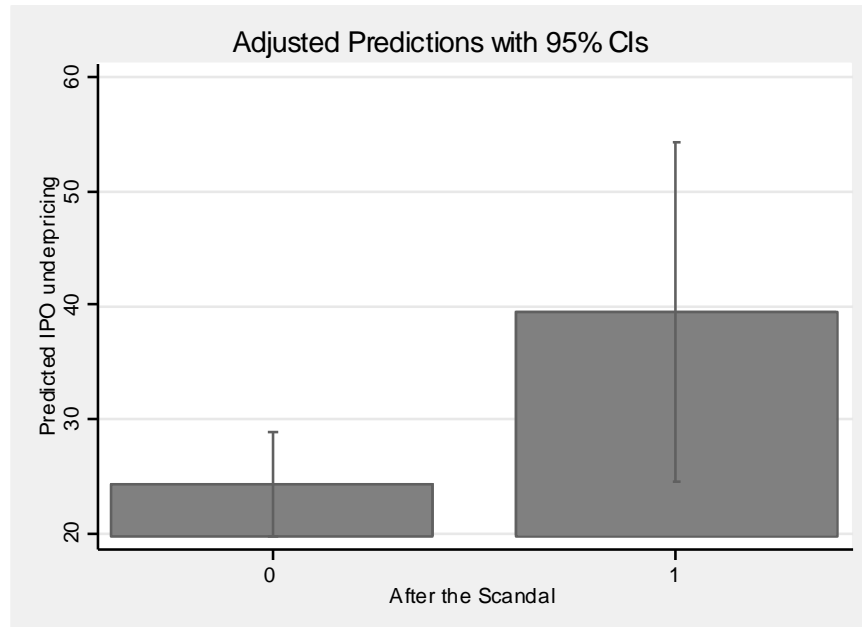
**Figure 4-2: Interaction Effect of Unicorn Firms and Media Sentiment Polarity**



**Figure 4-3: Interaction Effect of Unicorn Firms and Profitability**



**Figure 4-4: Interaction Effect of Unicorn Firms Before and After the Scandal**



Hypothesis 4 posits that a legitimacy jolt such as the Theranos scandal will moderate the relationship between unicorn firm status and IPO underpricing. Model 5 shows that the interaction term Post Scandal x Unicorn Venture is positive and only marginally significant ( $\beta = 20.244$ ,  $p = 0.08$ ). The result indicates that pre-scandal unicorn IPOs were underpriced by 24.3%, while post-scandal underpricing increased to 39.4% on average. The result confirms the existence of a temporal effect of scandal. But the evidence to claim support for Hypothesis 4 is weak at best. Model 6 is the full model. The regression result of media sentiment polarization (Hypothesis 2) and profitability effects (Hypothesis 3) still holds and is consistent with previous results. However, the statistical significance of the scandal (Hypothesis 4) was not significant.

#### **4.5.3. Post-hoc Analyses and Robustness Checks**

I considered a *post hoc* analysis for testing our findings' robustness. To check the robustness of our instrumental variable, I used a different instrumental variable (location in a top 10 technology hub city) as an additional instrumental variable. I drew the 2017 list of cities from Glassdoor.<sup>6</sup> I chose the top ten cities because their location was expected to positively associate with unicorn labels due to access to capital funding and human resources.<sup>7</sup> I found that 40% of the entire pre-IPO US unicorn firms were located in the top ten US cities (104 out of 255 unicorn firms), supporting our expectations. I measured this instrumental variable dummy as 1 if a company was located in the top ten cities and zero otherwise. Table 4.4 summarizes the results, similar to the qualitatively unchanged result reported in Table 4.3.

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<sup>6</sup>Retrieved from <https://www.cnbc.com/2017/07/27/tech-jobs-silicon-valley.html>, accessed September 30, 2019.

<sup>7</sup><https://techcrunch.com/2017/07/05/heres-where-youre-most-likely-to-randomly-run-into-a-unicorn-in-the-us/>, accessed August 20, 2020.

**Table 4-4: 2SLS Regression Results (Alternative IV): Top 10 Technology Hub Cities**

	Model 1	Model 2	Model 3
Hot Market	0.015 (0.465)	0.187 (0.466)	0.095 (0.467)
Firm Age	0.665* (0.394)	0.701* (0.406)	0.648 (0.401)
Firm Size	-0.003** (0.001)	-0.004** (0.002)	-0.003** (0.001)
Total Assets (log)	0.811 (5.628)	1.777 (5.616)	0.356 (5.746)
Net Income	0.009* (0.005)	-0.068** (0.033)	0.008 (0.005)
Share overhang	1.110 (0.792)	0.750 (0.687)	0.938 (0.759)
Volume of Media	-0.013*** (0.005)	-0.013*** (0.005)	-0.012** (0.005)
Positive Tenor of Media	-0.008 (0.055)	-0.007 (0.055)	-0.009 (0.055)
Pre-IPO Valuation	-0.001 (0.004)	0.001 (0.004)	-0.000 (0.003)
Investor Size	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Underwriter Reputation	0.135 (5.815)	-0.255 (5.750)	0.299 (5.789)
VC backed	14.176 (9.304)	12.034 (8.263)	16.865** (8.416)
Overpricing	25.449*** (5.580)	23.732*** (5.563)	24.323*** (5.676)
Risk Factor	-0.028 (0.078)	-0.051 (0.075)	-0.033 (0.077)
Inverse Mills Ratio	-6.193 (7.927)	-6.241 (8.003)	-6.423 (7.946)
Unicorn Venture	-108.991 (69.958)	16.209** (8.052)	13.643 (8.345)
Media sentiment polarity	-0.382 (0.329)		
Media sentiment polarity × Unicorn Venture	1.399* (0.753)		
Net Income × Unicorn Venture		0.079** (0.034)	
Post Scandal			10.568 (8.365)
Post Scandal × Unicorn Venture			21.057* (11.956)
Constant	18.107 (59.525)	-14.421 (57.175)	-15.848 (57.990)
IPO Year FE	Y	Y	Y
Industry FE	Y	Y	Y
N	226	226	226
R2	0.29	0.29	0.28
Adjusted R2	0.17	0.18	0.17

**Table 4-5: 2SLS Regression Results (without outlier venture firms)**

	Model 1	Model 2	Model 3
Hot Market	0.164 (0.478)	0.316 (0.476)	0.237 (0.475)
Firm Age	0.771* (0.429)	0.754* (0.437)	0.717* (0.434)
Firm Size	-0.005* (0.003)	-0.005 (0.003)	-0.004 (0.003)
Total Assets (log)	-0.192 (5.669)	0.921 (5.582)	-0.487 (5.777)
Net Income	0.007 (0.012)	-0.064* (0.038)	0.008 (0.013)
Share overhang	1.210 (0.875)	0.885 (0.779)	1.066 (0.847)
Volume of Media	-0.040*** (0.013)	-0.041*** (0.014)	-0.041*** (0.014)
Positive Tenor of Media	0.004 (0.056)	0.007 (0.055)	0.006 (0.055)
Pre-IPO Valuation	0.001 (0.004)	0.003 (0.004)	0.002 (0.004)
Investor Size	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)
Underwriter reputation	-1.084 (5.632)	-1.406 (5.583)	-0.798 (5.632)
VC backed	14.043 (9.544)	11.690 (9.111)	16.530* (9.005)
Overpricing	24.624*** (5.929)	23.084*** (5.893)	23.289*** (5.976)
Risk Factor	-0.042 (0.078)	-0.065 (0.075)	-0.048 (0.077)
Inverse Mills Ratio	-4.369 (8.000)	-3.123 (8.080)	-3.457 (8.052)
Unicorn Venture	-84.466 (61.300)	16.477** (7.960)	14.139* (8.392)
Media sentiment polarity	-0.272 (0.326)		
Media sentiment polarity × Unicorn Venture	1.132* (0.658)		
Net Income × Unicorn Venture		0.075** (0.035)	
Post Scandal			10.224 (7.968)
Post Scandal × Unicorn Venture			19.876* (11.589)
Constant	18.692 (65.231)	-7.821 (60.553)	-9.438 (61.743)
IPO Year FE	Y	Y	Y
Industry FE	Y	Y	Y
N	216	216	216
R2	0.31	0.31	0.31
Adjusted R2	0.19	0.20	0.19

**Table 4-6: 2SLS Regression Results (longer term)**

	Underpricing (3 Days After)	Underpricing (4 Days After)	Underpricing (5 Days After)
Hot Market	-0.087 (0.619)	0.052 (0.520)	-0.028 (0.529)
Firm Age	0.704 (0.489)	0.900* (0.477)	0.965** (0.486)
Firm Size	-0.006*** (0.002)	-0.006*** (0.002)	-0.006*** (0.002)
Total Assets (log)	4.277 (6.442)	4.891 (5.722)	4.880 (5.756)
Net Income	-0.081** (0.034)	-0.086** (0.041)	-0.093* (0.047)
Share overhang	0.769 (0.717)	0.578 (0.680)	0.454 (0.659)
Volume of Media	-0.017*** (0.005)	-0.017*** (0.004)	-0.017*** (0.004)
Positive Tenor of Media	0.007 (0.069)	0.014 (0.057)	0.029 (0.056)
Pre-IPO Valuation	0.001 (0.004)	0.001 (0.004)	0.000 (0.004)
Investor Size	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Underwriter reputation	-0.079 (5.740)	0.736 (5.076)	1.759 (5.073)
VC backed	7.954 (10.229)	11.867 (9.866)	10.501 (9.691)
Overpricing	19.450*** (5.247)	17.493*** (5.096)	17.527*** (5.225)
Risk Factor	-0.094 (0.076)	-0.060 (0.071)	-0.013 (0.071)
Inverse Mills Ratio	-6.732 (8.845)	-7.758 (8.591)	-8.626 (8.649)
Unicorn Venture	-131.619* (77.513)	-121.887 (79.058)	-115.196 (74.593)
Media sentiment polarity	-0.401 (0.288)	-0.478 (0.346)	-0.408 (0.322)
Media sentiment polarity × Unicorn Venture	1.636* (0.842)	1.517* (0.834)	1.439* (0.791)
Net Income × Unicorn Venture	0.096*** (0.035)	0.101** (0.042)	0.108** (0.049)
Post Scandal	22.124* (11.303)	21.378 (16.733)	25.712* (15.231)
Post Scandal × Unicorn Venture	-6.727 (22.170)	17.317 (32.870)	20.586 (31.351)
Constant	24.378 (61.031)	14.914 (58.247)	-0.528 (57.116)
IPO Year FE	Y	Y	Y
Industry FE	Y	Y	Y
N	226	226	226
R2	0.30	0.32	0.33
Adjusted R2	0.17	0.20	0.21

Next, I investigated the potential driving effects of outliers. Possibly, firms of outlying valuation can be significantly underpriced at IPO so that their impact drives the general underpricing. For example, when highly valued companies like Facebook or Twitter experience a considerable price discount at IPO, this may cause the effect I observed. To address the issue, I replicated the estimation with a pre-IPO valuation measure winsorized at 0.05 and found that ten firms fell into this outlier category. The results remained qualitatively unchanged, indicating that the direction and statistical significance were similar to the main findings. Table 4.5 summarizes these results.

Lastly, I tested the effect of underpricing in the longer term. I understand the potential likelihood of a first-day IPO effect; the temporary impact of underpricing on the first day could drive the result. To examine whether the result is only observable for a brief period, I tested the hypotheses in the longer term. I ran the regression with different dependent variables: three days out, four days out, and five days post IPO. Based on each day's closing price, I found the result was consistent and qualitatively similar over a more extended period. Table 4.6 summarizes these results. Overall, these analyses offered more confidence in our findings.

## **4.6. Discussion & Limitation**

### **4.6.1. Discussion**

This study intends to revisit past theories based on the recently emerging phenomenon. I examine the discrepancy between the IPO underpricing literature and the descriptive evidence to ask why highly valued private ventures such as a unicorn might face greater underpricing than their non-unicorn counterparts. Studies using information asymmetry arguments suggest that greater availability of information should lead to less underpricing. Research, drawing on legitimacy, asserts that greater media exposure helps legitimize a nascent venture, leading to less

IPO underpricing. While these two literature streams appropriately explain the underpricing of general firms at IPO, they fail to explain why unicorn ventures exhibit greater underpricing at IPO.

Building on this research and drawing on the sociology of expectations literature, I argued that the media not only disseminate stakeholders' perceptions of a venture's expectations based on the narratives it provides but also highlights concerns about whether such expectations can be fulfilled. Thus, when unicorn ventures' projections are perceived as uncertain (measured by media sentiment polarity), I expect greater underpricing of its shares at IPO, which is not the case with non-unicorn ventures offering more pedestrian narratives. I asserted that the relationship between being a unicorn venture and IPO underpricing would also be moderated by a venture's ability to show profits and external conditions such as legitimacy jolts that affect unicorn ventures but not their counterparts. Our results validate these assertions.

This chapter offers several significant contributions. The study contributes to the IPO underpricing literature by suggesting a more nuanced understanding of how the media influences IPO pricing. Prior IPO underpricing research has asserted that information asymmetry and media sentiments (i.e., volume and tenor) impact IPO underpricing. While it may be true for the "average" firm going public, it seems less applicable to highly valued firms such as unicorn ventures. Unicorn ventures have comparatively provided disruptive narratives that elicit high levels of expectation and uncertainty from the media. Often their narratives are hotly debated leading to sentiment polarity, which impacts IPO underpricing. Thus, I provide a nuanced understanding of how entrepreneurial narratives of such ventures offer that leads to uncertainty which, in turn, affects how shares are priced at IPO. Thus, our findings regarding the lack of support for prior theoretical assertions highlight an essential boundary condition for these past

explanations for IPO underpricing (Kotlar et al., 2018; Loughran & Ritter, 2004; Pollock and Rindova, 2003; Ritter, 2020).

This research also contributes to the sociology of expectations literature by conducting a systematic large-sample test of some of the theoretical assertions provided in this literature. Prior studies in the sociology of expectations have qualitatively theorized the effects of expectations (Borup & et al., 2006; Garud et al., 2014b; Lounsbury and Glynn, 2001) but have paid less attention to testing and verifying claims of whether future expectations lead to better entrepreneurial outcomes. Also, research has primarily focused on how ventures set expectations and how high expectations *and* not fulfilling them can be detrimental to a firm's legitimacy (Borup & et al., 2006; Garud, Schildt, & Lant, 2014). In contrast, this chapter examines the *different levels of expectation* and their impact on a critical venture outcome, in this case, resources retained by firms during IPOs. In contrast, the study offers a more nuanced perspective on how high levels of expectation, entailing uncertainty through media sentiment polarity, can influence the acquisition of financial resources in highly valued firms during their IPOs.

This chapter also outlined an alternative pathway and attendant mechanism by which high expectations can negatively affect highly valued young firms. Previous studies have suggested that setting expectations by an entrepreneurial narrative can grant legitimacy and prompt stakeholder support (Borup & et al., 2006; Garud et al., 2014b; Lounsbury and Glynn, 2001). While such studies have suggested that entrepreneurial stories set cognitive and pragmatic expectations by plotting and establishing intertextual links, our results show that excessive expectations may not always be advantageous. In fact, setting too high an expectation can leave a venture with fewer financial resources at IPO.

Finally, this chapter explains *when* high expectations can be more or less detrimental to

IPO price discounts. Previous studies have examined how internal and external characteristics of nascent ventures shape IPO pricing (Baker *et al.*, 2021; Borah *et al.*, 2018; Kotlar *et al.*, 2018). By identifying unique moderating factors on uncertainty, our study extends the contingencies of internal (i.e., posting profitability) and external characteristics (i.e., field-level legitimacy jolts). Consistent with previous studies on how ventures' factors can influence IPO underpricing (Baker *et al.*, 2021; Kotlar *et al.*, 2018; Leitterstorf and Rau, 2014), the results showed that internally, profitability provides an important reinforcing mechanism supporting certainty *en route* to high expectations. And externally, a legitimacy jolt threatens expectations by creating doubt about grandiose expectations. Thus, the distrust exacerbates uncertainty surrounding highly valued ventures as a category.

This chapter offers important managerial implications. Our findings may be helpful for entrepreneurs debating the optimal timing of IPOs as an exit option for a firm. Recent research suggests that entrepreneurial firms stay private longer in order to achieve a more extensive scale before IPO (Gao, Ritter, and Zhu, 2013; Kwon *et al.*, 2020). While these studies show how the timing of a liquidity event is associated with investor characteristics, they provide limited insights regarding which strategic actions entrepreneurs should choose. Our findings suggest that entrepreneurs may do well to manage their IPO timeframe strategically. After looking at the moderating effects of sentiment polarity and profitability, I suggest that unicorn entrepreneurs strategically reduce share discounts by considering the temporal aspect of the IPO. The optimal time to go public is when a firm can signal its prospects, reduce uncertainty in the media and provide solid profitability.

#### **4.6.2. Limitations and Future Studies**

Limitations of this work may present avenues for future research. One is our single-country research design, and analysis of institutional environments in the US may not be sufficient to generalize our findings. Future studies may wish to explore international contexts to determine whether the negative impact of a unicorn label at IPO would operate in the same way. More than a dozen unicorn firms operate outside the US, which may experience different IPO pricing and valuation mechanisms. Since unicorns do not always have a similar salience, it is worth examining those in other countries. Nevertheless, I believe that the fundamental mechanisms likely play essential roles.

Another opportunity may arise from considering more diverse contexts of unicorn IPOs. I did our best to contextualize the critical Theranos scandal, but distinctive unicorn scandals have occurred in recent years. For example, the 2019 WeWork fiasco stemmed from executives' unethical behavior, and such wrongdoing might have a different effect on IPO pricing. Future researchers may look at alternative types of scandal to document the nuances of unicorn labeling more richly.

#### **4.7. Conclusion**

This chapter has important implications for why a novel category of entrepreneurial ventures, unicorn ventures, experience greater underpricing at IPO. Focusing on unicorn ventures' high expectations and uncertainties, I shed light on an insidious consequence of unicorn status when acquiring financial resources at IPO. Extant theoretical explanations fail to explain IPO underpricing these young ventures experience, and I show that the theoretical arguments from the sociology of expectations literature better explain the persistence of IPO pricing for highly valued ventures. The importation of an expectation lens to the IPO underpricing literature offers

a more nuanced and helps advance our understanding of the persistence of IPO underpricing.

**Table 4-7: Support for Validity of the Instrumental Variable**

	Model 1	Model 2
Firm age	0.384 (0.356)	0.401 (0.355)
Firm size	-0.001 (0.001)	-0.001 (0.001)
Hot market	0.071 (0.451)	0.035 (0.460)
Total assets (log)	-0.469 (4.478)	-2.251 (5.263)
Net Income	0.007 (0.006)	0.007 (0.006)
Share overhang	1.059 (0.837)	0.986 (0.843)
Underwriter reputation	0.806 (5.762)	0.872 (5.713)
VC backed	9.993 (7.260)	10.170 (7.622)
Overpricing	25.788*** (5.512)	26.114*** (5.597)
Risk factor	-0.022 (0.078)	-0.017 (0.076)
Unicorn Firm	20.289*** (7.492)	17.707** (8.227)
Location in Silicon Valley	-4.816 (5.834)	-8.480 (6.174)
Inverse Mills Ratio		-6.386 (7.087)
Constant	-52.516 (54.975)	-30.457 (64.405)
IPO Year FE	Yes	Yes
Industry FE	Yes	Yes
N	226	226
R2	0.25	0.25
Adjusted R2	0.15	0.15

\*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

## 5. CONCLUSION

“Valuing a private investment or a portfolio of private investments is an inexact exercise. Because there is no liquid market for most of our positions, we don’t really know what someone would pay for them right now. So, we do the best we can, take a very conservative posture, and revisit them quarterly. That has worked well for us over the years.”

- Fred Wilson, A co-founder of Union Square Ventures

This dissertation explores the media legitimization, resource acquisition, and venture growth and scaling surrounding the unicorn ventures phenomenon. I attempted to answer several vital questions on the unicorn ventures phenomenon and to raise potentially intriguing questions for future studies.

In Chapter 2, I summarized the previous literature on the unicorn ventures phenomenon to contextualize four significant themes in the literature: a) the use of unicorn ventures is limited to anecdotal examples, b) studies show indirect relevance to unicorn ventures, c) studies focus on the financing mechanism of unicorn ventures, and d) the studies are descriptive and often a case study. The themes provide some hints for understanding unicorn ventures. However, we do not have a systematic and holistic knowledge of unicorn ventures. To further advance the literature, I suggested three relevant theoretical subjects in management and entrepreneurship scholarship: a) media legitimation, b) resource acquisition, and c) venture growth or scaling. I highlighted critical studies in each topical area.

Since the prior studies offered an incomplete understanding of unicorn ventures, I

attached two studies to address the gap in Chapters 3 and 4. In Chapter 3, I suggest exploratory research on the phenomenon of unicorn ventures to understand the factors that influence scaling speed to unicorn venture status. Using a unique dataset of the global unicorn ventures population as of June 2022, I examined the antecedents of unicorn venture status. I quantitatively examined the relationship between the factors, including founder/CEO, venture, investment, and industry factors, and unicorn scaling speed. In addition to debunking some of the prevalently accepted myths in understanding entrepreneurial growth and scaling, the chapter's main contribution is the first systematic approach to the unicorn ventures phenomenon that lays the foundation for future studies.

In Chapter 4, I investigate the consequences of unicorn ventures' status. I examined unicorn ventures at IPO to answer the question: *how do unicorn ventures differ from other ventures in media legitimization and resource acquisition?* Drawing on the "sociology of expectations" literature, I suggest that at IPO, unicorn ventures experience a greater level of IPO underpricing relative to other firms because of media uncertainty stemming from the high expectations surrounding the venture's future performance. I tested the hypotheses using a unique hand-collected dataset that includes the entire population of unicorn IPOs between 2011 and 2018. I also found moderation effects by a venture's ability to show profits and external conditions such as legitimacy jolts that affect unicorn ventures but not their counterparts.

## **5.1. Contribution**

The studies in this dissertation explain the antecedents and consequences of unicorn ventures as a category of high-growth, fast-scaling entrepreneurial firms. By contextualizing the novel and recent entrepreneurial phenomenon of unicorn ventures, these studies theoretically and empirically contribute to several streams of literature. First, the dissertation contributes to the

media legitimization literature by showing the multi-dimensionality of audiences. The previous studies have assumed that the audiences are monotonous; Audiences homogeneously share their assessment of the focal venture in the legitimization process (Pollock and Rindova, 2003; Überbacher, 2014). However, different audiences such as investors, analysts, suppliers, government, and customers have distinctive, often conflicting, norms, beliefs, rules, and procedures for assessing ventures (Fisher et al., 2017). The study, particularly Chapter 4, considers the interplay of multiple audiences simultaneously, adding a more nuanced relationship among the audiences in media legitimization processes.

Second, this dissertation also further extends the entrepreneurial resource acquisition literature. I find that while unicorn ventures raise disproportionate amounts of financial resources in the private phase, they have more significant uncertainty at IPO than comparable non-unicorn ventures. Previous studies emphasized the role of high expectations by focusing on the positive effects of expectations on gaining legitimacy and stakeholder support (Garud and Giuliani, 2013; Lounsbury and Glynn, 2001). However, the dissertation's findings, particularly Chapter 4, illustrate that high expectations of unicorn venture labeling may adversely affect resource acquisition. Thus, I contribute to resource acquisition by showing the dark side of high expectations on financial resource acquisition at IPO.

Third, the studies in this dissertation shed light on venture growth and scaling literature. The studies are among the first to systematically and holistically analyze the unicorn ventures phenomenon. Particularly from Chapter 2, which examines the factors influencing venture scaling speed, I extend prior work on venture growth and scaling by asking a novel question about how quickly the venture can achieve the valuation threshold. Earlier studies have focused on several factors that impact valuation or growth, yet I theoretically provide confirmed and

disconfirmed factors from the unicorn ventures setting. While I found several demonstrating results consistent with the previous studies, such as founder/CEO educational background and experiences (Eesley and Roberts, 2012; Hsu, 2007; Wadhwa *et al.*, 2010), I also disconfirmed some stylized facts. The disconfirmation is related to no statistical significance of the variables, including geographical location in the US and the Silicon Valley, seed funding, accelerator experience, corporate venture capital funding, and government grant. I also shed light on venture growth literature by identifying novel factors influencing venture scaling speed: Domain expertise (Ph.D.) and medical background (MD) of the founder/CEO, solo founder, geographical location in China and India, and secondary transaction experience of the venture.

## **5.2. Future Research**

Since the preceding chapters present interesting foundations for future studies, future research can attend to different antecedents at different levels such as individual (founder/CEO level, and founding team member level), firm level, and regional or national level.

**Individual-level Antecedents.** While previous chapters and the entrepreneurship research examined the role of founders/CEOs and their experiences (Gompers *et al.*, 2010; Hsu, 2007), we can discuss the interplay of different actions and experiences of founder/CEO with other individuals stakeholders in more detail. Following Venkatraman and coauthors (Venkataraman *et al.*, 2012), researchers should examine founders' actions and how such actions interact with other venture components to propel growth and scaling; further opportunities lay in understanding the actions and experiences of founder/CEO. For example, the interactions among founders/CEOs' venture experience or work experience previous to founding the unicorn venture may influence the venture scaling. Also, the interactions with the experiences or actions of founding team members, early joiners, or venture board members may be fruitful avenue for

further insights. More nuanced interactions of actions and experiences of individual-level entities can clearly exemplify the boundary conditions of individual-level effects on venture growth and scaling.

**Firm/Venture-level Antecedents.** The previous chapters, notably Chapter 3, suggested various venture-level antecedents; however, the lack of venture strategy and venture-level decision-making leaves the understanding incomplete. The strategic/competitive actions that differentiate unicorn ventures and others deserve more attention (Connelly *et al.*, 2017; Guo, Sengul, and Yu, 2020). To do so empirically, using a matched sample of unicorn and non-unicorn ventures would allow for deeper insights into differentiating high-growth ventures (unicorns) from other VC-funded ventures (would-be unicorns). Predicting which ventures with specific strategies are likely to become unicorns is the Holy Grail of VCs and highly relevant for entrepreneurship scholars interested in how ventures grow and scale.

**Regional/National-level Antecedents.** Previous studies have focused on the regional or national differences in the entrepreneurial landscape (Fainshmidt, Smith, and Aguilera, 2021; Hayton, George, and Zahra, 2002; Steensma *et al.*, 2000). However, the roles of cultural and institutional differences in achieving venture growth and scaling have not yet been examined. While the previous Chapter 3 included the effect of location in the US, China, and India, yet only limited to a few countries. The unicorn ventures phenomenon is a useful setting to test different institutional, cultural, and regulatory effects because unicorn ventures are a global phenomenon that encompasses 47 countries. Thus, future studies can benefit from comparative studies using institutional, cultural, and regulatory variables as explanatory variables.

### **5.3. Conclusion**

Unicorn ventures represent extreme cases of fast-paced venture growth (Gilbert *et al.*, 2006) and

offer a valuable context for studying entrepreneurial ventures that can scale rapidly (Desantola and Gulati, 2017) and gain access to resources (Clough *et al.*, 2019). These ventures have significantly impacted the entrepreneurial ecosystem as they exploit unattained market and technological opportunities to shape novel industries and market categories. They represent a small but high-profile category of entrepreneurial ventures that have captured media attention and garnered broad interest while attracting significant private venture capital (Brown & Wiles, 2020). While I recognize that more studies are needed to understand what it means to achieve unicorn status, the dissertation offers valuable insights into systematically understanding topical interests in the unicorn ventures phenomenon.

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