

The pace of scaling: founding team heterogeneity and the timing of Unicorn status

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Abstract

Purpose – This study explores how the founding team heterogeneity affects the time it takes for start-ups to achieve Unicorn status. While media and venture capital often emphasize the importance of diverse founding teams, empirical evidence on the impact of founders' heterogeneity on Unicorn success is limited.

Design/methodology/approach – We analyzed 75 European Unicorns' founding teams. Data were collected from multiple sources, including CB Insights and Crunchbase. Independent variables included measures of heterogeneity such as prior start-up experience, managerial experience, career background, education level, education type, gender, age, and team size. The analysis examined how these founder heterogeneity dimensions influence the time-to-Unicorn status.

Findings – The findings indicate that educational heterogeneity significantly affects the time to achieve Unicorn status. Specifically, higher heterogeneity in educational level is associated with longer time-to-Unicorn, while greater heterogeneity in educational type is associated with shorter time-to-Unicorn. Additionally, larger founding teams are associated with extended time-to-Unicorn, contradicting prior findings that emphasized the benefits of team size.

Originality/value – This study contributes to the Unicorn literature by challenging assumptions regarding the universally positive effects of founding teams' heterogeneity. It extends human capital theory by highlighting that not all forms of heterogeneity are beneficial. The research suggests that educational diversity and team size must be strategically managed to balance potential growth benefits and operational complexities, offering practical implications for entrepreneurs and investors.

Keywords Unicorn, Founders, Heterogeneity, Start-up, Human capital

Paper type Research article

1. Introduction

Unicorns – startups reaching \$1 billion valuations in early stages – have become iconic benchmarks of entrepreneurial success (Lee, 2013), shaping employment, innovation, and institutional ecosystems (McNeill, 2016). Their growth trajectories often defy conventional models: firms like Facebook attracted sustained funding despite early unprofitability (Cristofaro, 2017), prompting rising scholarly interest and debate (Aldrich and Ruef, 2018; Kuckertz *et al.*, 2023).

Existing research highlights the link between founding team heterogeneity and various entrepreneurial outcomes (e.g. Beckman, 2006; Kaiser and Müller, 2015), yet it rarely considers how such heterogeneity affects the *pace* of growth (e.g. Gimmon and Levie, 2010). In Unicorn ventures, where achieving \$1 billion valuations rapidly is a strategic imperative, the temporal dimension of growth is not secondary—it shapes investor sentiment, resource mobilization, and market dominance (Belitski *et al.*, 2023; Kabbara and Hagen, 2023). Founding team heterogeneity introduces cognitive variety (Hambrick *et al.*, 1996; Tzabbar and Margolis, 2017) and may facilitate innovation (Marvel and Lumpkin, 2007), but it can also

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generate coordination frictions, misaligned decision frames, and communication delays (Williams and O'Reilly, 1998; Simons *et al.*, 1999; Zhou and Rosini, 2015). These effects are likely amplified in hyper-growth contexts where timing exerts structural pressure on decision-making and execution. Most studies to date assess heterogeneity as a predictor of performance in binary or aggregate terms, overlooking its dynamic interaction with speed-sensitive milestones such as time-to-Unicorn (Das *et al.*, 2021). Addressing this gap, we ask: *To what extent does the founding team's heterogeneity influence the time it takes to reach Unicorn status, and through what mechanisms?* Failing to address how founding team heterogeneity influences time-to-Unicorn status limits our theoretical understanding of how team composition affects not just whether ventures succeed, but *how quickly they scale*—overlooking critical temporal dynamics with strategic, financial, and organizational consequences (e.g. Coad *et al.*, 2023; Audretsch *et al.*, 2024).

To answer the above question, we investigated the entrepreneurial founding team – i.e. individuals with equity in the business and actively involved in strategic decision-making at the venture's founding (Ucbasaran *et al.*, 2003) – of 75 European Unicorns founded between 2002 and 2022. This study employs an OLS linear regression approach to test the hypotheses formulated based on data collected from multiple sources, including CB Insights and Crunchbase. Independent variables included measures of heterogeneity across various human capital dimensions: start-up experience, managerial experience, other career experience, level of education, kind of education, gender, age, and team size.

Theoretically, this study advances Unicorn research by challenging the assumption that founding team heterogeneity is uniformly beneficial for venture performance. While prior works suggest that diversity in educational background fosters creativity and enhances access to varied resources (Marvel and Lumpkin, 2007; Zimmerman, 2008; Ratzinger *et al.*, 2018), our findings show a more nuanced picture: heterogeneity in educational level is associated with a longer time-to-Unicorn, whereas heterogeneity in educational type is associated with a shorter time-to-Unicorn. This suggests that different forms of cognitive diversity can exert opposite effects on growth speed. Educational level heterogeneity may introduce coordination burdens, status asymmetries, and misaligned decision frames that delay strategic action (Simons *et al.*, 1999; Kilduff *et al.*, 2000; Williams and O'Reilly, 1998). These insights extend Human Capital Theory (Becker, 1964; Ployhart *et al.*, 2014) by demonstrating that not all human capital configurations are equally functional in time-sensitive scaling environments: certain forms of diversity can dilute—rather than enhance—the effective deployment of capital when cohesion and execution speed are critical. In turn, we refine Upper Echelons Theory (Hambrick and Mason, 1984; Hambrick, 2007; Abatecola and Cristofaro, 2020) by introducing a *temporal contingency*—showing that top team diversity not only shapes strategic choices, but also the velocity at which firms achieve critical growth milestones. Our findings suggest that in hypergrowth contexts, team heterogeneity functions not merely as a cognitive input to strategy, but as a structural condition that mediates the alignment, pacing, and effectiveness of strategic execution.

Our findings offer implications for entrepreneurs, investors, and accelerators. Founders should avoid over-indexing on educational or functional variety without mechanisms to ensure coordination, such as clearly defined roles, fast feedback loops, and shared mental models. Investors should assess the heterogeneity of founding teams and their demonstrated ability to execute quickly under pressure. Accelerators and incubators should provide targeted support for heterogeneous teams, helping them align strategy and streamline workflows. Effective scaling requires balancing diversity with operational cohesion, especially in time-sensitive, high-growth ventures (Belitski *et al.*, 2023; Das *et al.*, 2021).

The article is structured as follows. Section 2 reviews the literature on firm growth, unicorn emergence, and entrepreneurial teams, drawing primarily on Human Capital Theory and Upper Echelons Theory to develop our hypotheses. Section 3 outlines the data sources, the European context of our sample, and the methodological approach. Section 4 presents the empirical findings. Section 5 offers a detailed discussion of the results, while Section 6

explores their theoretical and practical implications and proposes avenues for future research. [Section 7](#) concludes the article.

2. Theoretical premises and hypotheses development

The entrepreneurial world boasts a variety of ventures that are often classified according to their distinctive characteristics and behavioral patterns ([Cristofaro et al., 2023b](#)). In the landscape of high-growth firms, scholars emphasize that growth dynamics are time-varying processes with several underlying triggers and drivers ([Kabbara and Hagen, 2023](#)). Accordingly, recent research has started categorizing different high-performing firms' subgroups, distinguishing gazelles [[1](#)] and unicorns based on their growth trajectories ([Gilbert et al., 2006](#)). On the one hand, gazelles focus on profitability to sustain long-term growth, which is characterized by a measured and steady pace; on the other hand, unicorns often exhibit short-term *hyper-growth*, driven by their orientation towards attracting the investment needed to support the implementation of disruptive and scalable business models ([Kuratko et al., 2020](#); [Cristofaro et al., 2024](#)).

Nonetheless, it is interesting that not all unicorns reach their status simultaneously. Achieving unicorn status depends on the monetary valuation negotiated between investors and founders ([Bock and Hackober, 2020](#); [Kotha et al., 2022](#)); high valuations, in turn, reflect not only the growth potential of the venture but also the strategic and managerial skills of the entrepreneurial team ([Fitza et al., 2009](#); [Hsu, 2004, 2007](#)). Regarding the evaluation process, some startups tend to reach unicorn status quickly. In contrast, others tend to do so more slowly, potentially affecting competitive dynamics and long-term growth trajectories. Scaling speed can significantly impact competitive mechanisms, shaping technological and sectoral evolution. Firms that quickly achieve unicorn status often gain a tremendous competitive advantage, even becoming the precursors of new technologies and the engine of sectoral growth. Moreover, and by implication, the scaling speed of unicorns is an indicator that may affect the involvement of relevant stakeholders that are critical for long-term entrepreneurial success. Not surprisingly, recent research suggests that the time to achieve unicorn status is a key driver of long-term growth and survival ([Kabbara and Hagen, 2023](#)).

In light of the above, although scaling speed plays a pivotal role in the competitive positioning and survival of unicorn firms, research on the factors influencing the temporal dynamics of hyper-growth remains limited ([DeSantola and Gulati, 2017](#); [Kabbara and Hagen, 2023](#); [Kotha et al., 2022](#)). Since founders' socio-demographics serve as important signals affecting evaluation processes ([Shepherd, 1999](#)), it is crucial to examine how founding teams' characteristics shape the time required to achieve unicorn status—particularly in the European context, which is gaining exciting momentum in the global unicorn landscape ([Vogelaar and Stam, 2024](#)). To guide this inquiry, we draw on two well-established perspectives: Human Capital Theory, which emphasizes the role of individuals' accumulated skills, knowledge, and experiences in shaping outcomes ([Becker, 1964](#)), and Upper Echelons Theory, which highlights how the demographic and cognitive composition of top teams influences organizational choices and performance ([Hambrick and Mason, 1984](#)). These complementary lenses provide the theoretical foundation for our hypotheses on how founder heterogeneity and team structure affect the temporal trajectory to unicorn status.

2.1 Unicorns and the relevance of founders

The business ecosystem is a vibrant and diverse landscape filled with various types of startups, metaphorically forming an “entrepreneurial jungle” ([Cristofaro et al., 2023b](#)). Within it, Unicorns represent the entrepreneurial species attracting growing practice and scholarly attention.

As of October 2023, the Unicorn population stands at an impressive 1,230 and collectively boasts a valuation of approximately US\$3.821 billion ([CB Insights, 2023](#)). Most of them are in the U.S. (653; 53%), China (172; 14%), and, as a continent, Europe (160; 13%). In terms of

industries, most operate in high-tech (371; 30%), financial services (216; 18%), and consumer retail (213; 17%). The magnitude of their impact on the business landscape is undeniable, prompting scholars and practitioners alike to scrutinize various facets of Unicorns. Many Unicorns derive value through mathematical algorithms in two-sided markets, extracting customer value via platform technologies and cross-multichannel selling (Cristofaro *et al.*, 2023a). Typically, their business models exhibit high scalability and are centered around a singular product or service (Lee, 2013).

Unicorns often require substantial capital infusion, particularly in their early years, to fuel rapid expansion and innovation. This need for a massive amount of money arises from the scale and speed at which these companies aim to disrupt markets and establish dominance, which requires huge infrastructure investments, operations, and marketing. In this pursuit, the role of investors becomes pivotal, as they not only provide financial resources but also bring strategic value through expertise, networks, and guidance (Cristofaro, 2017). From the investors' perspective, however, investing in early-stage startups is extremely risky due to the absence of a credible track record of past organizational results and traditional financial information. Investors thus rely on signals of organizational qualities and founders' characteristics, meant as a proxy of future business success and ability to manage resources (Becker, 1964; Bloodgood *et al.*, 1996), which sometimes unconsciously lead investors to escalate their commitment toward poor, profitable companies that have high growth expected signals (Abatecola *et al.*, 2021; Cristofaro *et al.*, 2023a; Straker *et al.*, 2021). Jha *et al.* (2024) studied one of them, who found a strong positive relationship between the ambidextrous skills of founding teams and the speed at which a start-up reaches Unicorn status. The findings indicate that the collective exploratory skills of the founding team may play a more crucial role in accelerating the path to Unicorn status than their exploitative skills. Therefore, intentionally or not, investors closely examine the founding team's education, functional background, and inner characteristics to assess if that venture has the 'genes' to become a high-growth company like a Unicorn.

2.2 Human capital heterogeneity and the time-to-unicorn status

Human Capital Theory, proposed by Gary Becker in 1964, posits that individuals' skills, knowledge, and abilities (human capital) – including demographic factors (as they can influence perspectives and experiences; Wößmann, 2003) – are akin to other forms of capital like physical or financial assets [2]. According to this theory, investments in human capital through education, training, and experience enhance individuals' productivity and earning potential. Human capital is a critical determinant of economic growth and development, enabling individuals to contribute more effectively to organizational success and societal progress (Ployhart *et al.*, 2014; Goldin, 2016). The theory emphasizes that the accumulation and utilization of human capital are essential for individuals to adapt to changing economic conditions and technological advancements, thereby fostering innovation and competitiveness in the workforce and the broader economy.

In the early stages of firms, the initial human capital is intricately linked to the founding team members, exerting a substantial influence on strategic decisions (e.g. Boeker, 1989). As the first architects of a company's trajectory, founders bring a wealth of human capital, encompassing their educational backgrounds, industry experiences, and entrepreneurial acumen. This amalgamation of knowledge, skills, and other relevant characteristics shapes their cognitive frames, influencing how they perceive challenges and opportunities and make strategic decisions (e.g. Bates, 1990; Gimeno *et al.*, 1997; Marvel and Lumpkin, 2007; Unger *et al.*, 2011).

Founders' characteristics, such as educational backgrounds, industry experiences, and entrepreneurial competencies, collectively inform their strategic cognition, shaping how they identify opportunities, frame risks, and deploy firm resources (Boeker, 1989; Bates, 1990; Gimeno *et al.*, 1997; Marvel and Lumpkin, 2007; Unger *et al.*, 2011). This aligns with Upper Echelons Theory (Hambrick and Mason, 1984), which posits that top executives' observable

characteristics serve as proxies for their deeper cognitive frameworks, which in turn guide strategic choices and influence organizational trajectories (Hambrick, 2007; Abatecola and Cristofaro, 2020). In brief, TMT heterogeneity represents the organizational-level configuration of human capital diversity, and UET serves as the theoretical architecture that explains how such diversity influences firm outcomes (Nielsen, 2010; Ndofo et al., 2015; Unger et al., 2011; Martin et al., 2013; Qin and Kong, 2021). HCT offers the foundational rationale for why variation in education, experience, and demographics matters; UET articulates the mechanisms through which these variations exert influence. Relatedly, the intersection of HCT and UET becomes particularly salient in high-growth entrepreneurial ventures such as Unicorns—start-ups that rapidly achieve billion-dollar valuations. In these ventures, human capital is not merely an input but a strategic differentiator. In this work, we propose that it is not only the presence of individual founder attributes but their heterogeneity within the founding team that matters most. As evidenced by the literature, founders' diversity across experience, educational backgrounds, gender, and age introduces cognitive variation, which can expand strategic bandwidth and raise capital from investors (Zimmerman, 2008; Franco et al., 2021; Pinelli et al., 2022).

Drawing on Human Capital Theory (Becker, 1964), diverse experiential backgrounds provide complementary knowledge and skillsets that enhance a team's problem-solving capacity and responsiveness to dynamic environments. From the lens of Upper Echelons Theory (Hambrick and Mason, 1984), experience heterogeneity reflects variation in cognitive frames, which broadens the range of strategic alternatives considered and facilitates innovation under uncertainty. Additionally, in early-stage contexts marked by limited performance data, heterogeneous experiential profiles among founders serve a signaling function (Zimmerman, 2008), communicating to investors and stakeholders that the team possesses the flexibility, foresight, and adaptive capacity necessary for rapid scaling. In the context of Unicorns, Giardino et al. (2023), who reviewed factors underpinning the emergence of these exceptional ventures, highlight the importance of entrepreneurial qualities such as founders' experience, skills, and vision. These attributes are essential for innovation and adaptation to rapidly evolving markets, a view echoed by Lehmann et al. (2019). Founders' strategic ability to pool resources and forge strategic partnerships also plays a pivotal role in the growth of Unicorns (Kotha et al., 2022; Kabbara and Hagen, 2023). Diving deeper into experience heterogeneity, studies have shown that diverse experience within entrepreneurial teams enhances performance. Thiess et al. (2016) analyzed 519 nascent U.S. venture teams and found that balanced experience—combining management and start-up expertise—fosters high growth. Zhang and Wang (2017), studying 183 Chinese technology start-ups, found a positive relationship between tenure heterogeneity within top management teams (TMTs) and firm growth performance. However, functional experience heterogeneity was negatively associated. In contrast, Zimmerman (2008) observed that TMT heterogeneity in functional backgrounds positively influenced capital raised through Initial Public Offerings (IPOs) among 243 U.S.-based software firms.

These findings reinforce the theory that heterogeneity in founders' prior experiences constitutes a critical driver of strategic agility and resource mobilization in high-growth ventures. Therefore:

- H1.* The greater the experience heterogeneity of founders, the less time the start-up takes to reach Unicorn status.

Educational heterogeneity among founders constitutes a critical dimension of human capital diversity with implications for strategic cognition and organizational outcomes. Prior research shows that educational diversity can enrich a team's cognitive base, fostering innovation and learning (Wright et al., 2001; Marvel and Lumpkin, 2007). Yet such heterogeneity is not unambiguously beneficial. Differences in educational level may generate status hierarchies or misaligned expectations that complicate collaboration (Kilduff et al., 2000), while variation in educational type (e.g. technical versus managerial disciplines) can produce divergent problem-framing that inhibits consensus-building (Knight et al., 1999; Simons et al., 1999).

Although these differences may stimulate creativity and enhance strategic flexibility (Carpenter and Fredrickson, 2001), excessive divergence risks undermining cohesion, reducing strategic alignment, and delaying scaling efforts (Williams and O'Reilly, 1998).

With regard to Unicorns literature, Kotha *et al.* (2022), in their study on Unicorns, found that while higher educational levels (e.g. doctoral degrees) have been positively associated with high venture valuations in prior works (e.g. Hsu, 2007; Wasserman, 2017), they showed no significant association with the time required to achieve Unicorn status. Similar mixed findings are evident in broader high-growth firm literature. Ensley *et al.* (1998), analyzing entrepreneurial team skill composition in 88 firms from the U.S.'s 500 fastest-growing companies, reported that heterogeneity in academic majors within teams negatively affected firm growth, suggesting that such diversity may delay the coordination and execution processes necessary for rapid scaling. Similarly, Zhang and Wang (2017) identified a significant negative relationship between educational level heterogeneity and the performance of Chinese technology start-ups, implying potential timing setbacks due to misaligned expectations or communication frictions. In contrast, Pinelli *et al.* (2022), examining a sample of 1,078 start-ups, found that educational level heterogeneity positively influenced the funds raised in early stages, echoing Zimmerman's (2008) findings in the IPO context, which linked educational diversity to high-growth potential. However, Pinelli *et al.* (2022) also observed that the concurrent presence of high educational diversity and level negatively moderated this positive relationship, potentially increasing the time needed to translate early funding into scalable execution.

Adding further nuance, Eklund and van Crielingen (2022), studying "gazelles" in Denmark, demonstrated that intangible capital investments, such as organizational capabilities, increase the likelihood of achieving rapid growth. Educational diversity emerged as a positive high-growth driver, particularly when combined with a higher proportion of highly educated employees. However, this positive effect was counterbalanced by the negative impact of a high share of highly educated individuals when considered in isolation, suggesting that educational over-concentration or imbalance may slow down strategic alignment and thus delay growth milestones.

These findings underscore the nuanced role of educational characteristics in fostering high growth and the potential influence of educational heterogeneity on the timing of that growth. While diversity in educational backgrounds can unlock creativity and enhance resource acquisition capabilities, excessive heterogeneity may hinder cohesion and delay the execution of time-sensitive scaling strategies. Therefore:

- H2a. The greater the heterogeneity in terms of founders' level of education, the more time the start-up may take to reach Unicorn status.
- H2b. The greater the heterogeneity in terms of founders' kind of education, the more time the start-up may take to reach Unicorn status.

Gender heterogeneity among founders represents a salient dimension of human capital diversity that can shape strategic cognition and entrepreneurial outcomes. Individuals of different genders often accumulate and apply knowledge through distinct social and career trajectories, contributing differentiated yet complementary capabilities to the team. Such diversity has enhanced team information processing, creative synthesis, and strategic problem-solving (Hoogendoorn *et al.*, 2013; Torchia *et al.*, 2011). However, gender-based differences in communication styles and role expectations may also generate interpersonal friction or inhibit cohesion (Bear and Woolley, 2011). While gender-diverse teams may benefit from broader insights and adaptive perspectives (Campbell and Mínguez-Vera, 2008), this heterogeneity can equally complicate consensus-building and increase coordination needs, particularly in fast-paced, high-growth environments (Joshi and Roh, 2009).

In high-growth ventures, research highlights that gender can affect venture valuation, particularly when focusing on the entrepreneur rather than the business itself (Lee and Huang, 2018; Marlow and McAdam, 2013). Regarding gender dynamics, Hohl *et al.* (2021),

analyzing 895 entrepreneurial pitches on Shark Tank, found no evidence of gender bias in pitch success rates for female entrepreneurs. However, their study revealed significantly lower self-assessed and final deal valuations for female entrepreneurs, indicating a self-imposed gender gap in entrepreneurship. This aligns with [Hussain et al. \(2023\)](#), who also noted systemic disparities in entrepreneurial outcomes. At the organizational level, [Mauro et al. \(2023\)](#), investigating high-growth firms in the health sector, found a positive and statistically significant relationship between board gender diversity and high-growth performance in gazelles. This suggests that gender diversity within leadership teams may foster more balanced decision-making, enhance strategic flexibility, and ultimately accelerate growth trajectories. Nevertheless, broader evidence remains mixed. A recent systematic review by [Laique et al. \(2023\)](#) did not uncover conclusive evidence of a decisive relationship between board gender diversity and high-growth, highlighting the variability in findings across contexts and industries. While diversity, particularly in leadership, may offer competitive advantages through varied insights and complementary thinking styles, it may also involve coordination challenges that impact the speed of strategic execution. These tensions underscore the need to better understand how and when gender heterogeneity contributes not only to performance outcomes, but also to the timing with which firms achieve critical growth milestones such as Unicorn status. Therefore:

- H3.* The greater the gender heterogeneity of founders, the less time the start-up may take to reach Unicorn status.

Age heterogeneity among founders represents a salient dimension of human capital diversity that can influence team dynamics, strategic thinking, and adaptability. Individuals at different life stages accumulate distinct forms of experiential knowledge, problem-solving approaches, and adaptive behaviors, thereby enriching the human capital pool of entrepreneurial teams and fostering a wider range of cognitive and strategic capabilities. Such heterogeneity may also introduce differentiated values, temporal orientations, and risk preferences, which can expand the team's decision-making repertoire under uncertainty ([Nielsen, 2010](#)). Research in MOS underscores these dynamics, showing that age-diverse teams can integrate youthful creativity with seasoned judgment, enhancing innovation and resilience ([Richard and Shelor, 2002](#)). However, large age gaps can also create generational divides that hinder communication, coordination, and trust (e.g. [EmadEldeen et al., 2021](#)). While moderate age diversity may improve team adaptability and performance, excessive disparity may slow down consensus-building and strategic alignment in high-growth contexts ([Wiersema and Bantel, 1992](#)).

In the context of Unicorns, [Kotha et al. \(2022\)](#) found no significant impact of founders' age on the time required to achieve Unicorn status. This contrasts with broader studies that highlight both positive and negative effects of age diversity within leadership teams. For instance, [Richard and Shelor \(2002\)](#), investigating 1,305 U.S. firms, found that TMT age diversity negatively influenced return on assets (ROA) when assessed independently. However, they observed a positive relationship with high-growth sales, an indicator of organizational expansion, though this relationship was nonlinear. Specifically, low to medium levels of age diversity were positively associated with faster growth, whereas high levels appeared to reduce strategic coherence, potentially slowing organizational momentum. Similarly, [Dagsson and Larsson \(2011\)](#), in their analysis of companies listed on the OMX Stockholm exchange, identified a significant relationship between age diversity and high-growth performance, particularly as measured by ROA—suggesting that age-heterogeneous teams may leverage generational experience to drive expansion. [Tanikawa et al. \(2017\)](#), studying 867 TMTs in Korean manufacturing firms, reported that age diversity negatively influenced return on equity (ROE), although this effect was mitigated when teams consisted of relatively older members—highlighting the importance of age composition in moderating diversity's effects. Taken together, these studies suggest that moderate age heterogeneity may foster faster strategic learning and responsiveness, while extreme diversity could hinder coordination and delay execution. This duality underscores the relevance of age diversity not

only for performance outcomes but also for the pace at which high-growth firms scale. Accordingly:

- H4. The greater the age heterogeneity of founders, the less time the start-up may take to reach Unicorn status.

Founding team size reflects a structural dimension of human capital aggregation that influences both the breadth of capabilities and the complexity of coordination. Larger teams are able to pool a wider set of skills, knowledge, and experiences, thereby expanding the venture's cognitive and operational capacity. This accumulation of diverse competencies can enhance problem-solving, enable multitasking across key functions, and improve early-stage opportunity recognition. Team size also shapes how diverse viewpoints are integrated and translated into strategic action. Research in MOS shows that larger founding teams are more likely to access external resources, manage complexity, and adapt to changing environments (Eisenhardt and Schoonhoven, 1990; Beckman *et al.*, 2007). However, as team size increases, so do coordination costs, cognitive conflict, and the risk of divergent priorities or power struggles (Amason and Sapienza, 1997; Ensley *et al.*, 2002). Without strong integrative mechanisms, larger teams may face delayed decision-making, reduced agility, and internal misalignment that impedes rapid scaling (West, 2007; Greenberg and Mollick, 2018a, b; Mollick, 2020).

Research on high-growth companies has identified that ventures with larger founding teams tend to attract greater investor interest, facilitating the mobilization of more resources compared to individually founded businesses (Miloud *et al.*, 2012). Larger teams can offer broader networks, richer skill sets, and a more expansive base of human capital. However, these advantages are often accompanied by significant coordination and governance challenges. Effective resource allocation and strategic decision-making require a cohesive and well-aligned entrepreneurial team. As team size increases, the likelihood of internal conflicts stemming from power struggles and misaligned priorities also rises (Temel and Forsman, 2022). Such conflicts can hinder not only performance but also slow down the decision-making process, delaying the venture's ability to act quickly in fast-paced environments (Greer *et al.*, 2011). Personality clashes and divergent self-interests tend to exacerbate these issues, especially when the founding team lacks mechanisms for managing dissent. Studies suggest that conflicts over shared vision and strategic direction are more frequent in larger teams, which can critically undermine decision-making efficiency and impede timely growth execution (Aubé *et al.*, 2011; Greenberg and Mollick, 2018a, b). These tensions underscore the fine balance required to leverage the creativity and synergy of larger teams without succumbing to the friction that can delay early-stage scaling. In the context of Unicorns – where agility and rapid growth are central – misalignment in larger founding teams can be particularly detrimental. While team size may amplify growth potential, it may also extend the time needed to achieve major growth milestones due to slower consensus-building and strategic implementation (Kotha *et al.*, 2022). Therefore:

- H5. The larger the founding team, the longer the start-up may take to reach Unicorn status.

3. Methodology

3.1 Unicorns' landscape

The European tech landscape has faced a significant expansion in recent years, to the point that it has evolved from a major force at the global level. According to a 2024 report by Atomico, this great change has been supported by a concrete increase in funding, with European startups attracting \$426 billion between 2015 and 2024 – a nearly tenfold increase over the previous decade. This financial momentum is also supported by a significant growth in human capital, as the sector's workforce has expanded to 3.5 million people, reflecting a stronger shift toward entrepreneurship and startups than in the past. The resulting today's industrial landscape is, consequently, highly diversified, showing strength in Fintech and a leading role in

sustainability. Indeed, in 2024, 21% of all capital invested in European tech was directed toward climate-focused companies, a share nearly double that of the U.S. equivalent (11%).

This shift reflects a broader European commitment to mission-oriented innovation, with strong policy alignment across EU and national institutions fostering deep-tech investment in areas such as clean energy, green mobility, and digital health (Compañó *et al.*, 2024). In contrast to consumer-facing platform models dominant in the U.S., European scale-ups are often embedded in strategic sectors tied to societal and environmental priorities. This fast growth has contributed to building what we know to be, today, as a strong and valuable ecosystem. At the beginning of 2025, indeed, Europe hosts 202 unicorns with a combined valuation of approximately \$561.7 billion, with hubs in the United Kingdom (54), Germany (31), and France (28) leading the continent (Compañó *et al.*, 2024). However, the European model for scaling is distinct from its global counterparts. Its trajectory is shaped by the inherent challenges of market fragmentation, depending on different regulations, languages, and business cultures.

This stands in contrast to the monolithic U.S. market and the often state-supported, hyper-growth strategies characteristic of Asia, positioning Europe as a key, yet uniquely complex, actor in the global tech race (Testa *et al.*, 2022). These structural frictions—particularly regulatory heterogeneity and institutional complexity—make European ventures slower to internationalize and scale, despite comparable levels of innovation output. As Testa *et al.* (2022) emphasize, time-to-Unicorn in Europe is significantly longer than in the U.S. or China, with entrepreneurs often needing to build cross-border networks and navigate multiple compliance regimes simultaneously.

3.2 Research design

To test the predictions of our model, we ran an OLS linear regression. Data for the empirical analyses were hand-collected by multiple sources – including reliable databases already used for academic studies concerning start-ups, such as CB Insights and Crunchbase. The procedure for data collection was as follows.

First, by consulting CB Insights (2022), we selected all Unicorns founded in Europe from 2002 to 2022. Specifically, we gathered data on the founding year, the year when the start-up achieved the \$1 billion valuation, the country of the unicorns' headquarters, and the industry sector in which the unicorns operate. These data generated a sample of 75 firms from 16 European countries that achieved Unicorn status between 2018 and 2022. On average, the sampled firms took 6.7 years to become Unicorns. Second, for each Unicorn, we identified the size and members of the founding team by cross-referencing information available on the European Unicorn and Soonicorn Report (Huebl *et al.*, 2022) with public information available on Crunchbase and the Unicorn's website. These preliminary data, hence, generated a sample of 199 founders. To identify their socio-demographic characteristics, we cross-referenced the founders' data on Crunchbase with public information on LinkedIn profiles and media articles reporting on the founders' activities and background. We collected socio-demographic data of the founders relative to the year of foundation.

In this way, we gathered data regarding the following socio-demographic variables: gender, age, level of education, kind of education, number of other founded organizations, number of management experiences, and number of other career experiences. In particular, to build the number of other founded organizations, we counted the number of venture firms founded before the current venture unicorn. Then again, to make the number of management experiences, we counted the total number of the founders' experiences as C-Suite executives or project managers. Finally, to build the number of other career experiences, we counted the founders' experiences as advisors, mentors, investors, analysts, software developers, and researchers. As a result, the final dataset consists of 75 unicorns and 199 founders with complete information useful for operationalizing our dependent, independent, and control variables—introduced explicitly in the following subsection.

3.3 Variable measurements

This section details the operationalization of the dependent and independent variables, providing the analytical foundation for examining the impact of founders' heterogeneity on the time to Unicorn status.

Time-to-Unicorn Status. For each unicorn in the sample, we calculated the years elapsed from the founding year to when the start-up achieved the \$1 billion valuation (Venancio et al., 2023).

To operationalize our independent variables, we first categorized the *team size* based on the number of team members for each Unicorn in the sample. After that, we calculated the Blau index (Blau, 1977) for each socio-demographic variable: gender, age, level of education, kind of education, number of other founded organizations, number of management experiences, and number of other career experiences. As done in similar works concerning diversity in start-up teams (Visintin and Pittino, 2014; Eklund and Van Crielingen, 2022), independent variables are considered categorical. As advanced by Biemann and Kearney (2010), when studying biases inherent in common diversity measures when applied to groups of varying sizes in organizational studies, diversity within an organizational group can reflect a range of differences, such as varying knowledge, skills, information, and experiences (Harrison and Klein, 2007). This concept, thus *diversity as variety*, aligns closely with the information/decision-making perspective, which suggests that diversity in task-relevant resources enhances the ability to generate synergistic and innovative solutions – superior to those achieved by homogeneous groups that draw from a more limited resource pool (Williams and O'Reilly, 1998). According to Biemann and Kearney (2010), a categorical scale is required to assess diversity as variety, and Blau's (1977) index is the most widely used tool to capture these qualitative distinctions (Harrison and Klein, 2007). Therefore, we use the Blau index (Blau, 1977) and, in particular, its corrected measurement provided by Biemann and Kearney (2010) – as also suggested by Harrison and Klein (2007, p. 1211).

The Blau index is a widely used measure of group heterogeneity, quantifying the probability that two randomly selected members belong to different categories. It is calculated as:

$$B = 1 - \sum_{i=1}^k p_i^2 \quad (1)$$

where p_i corresponds to the proportion of group members in i^{th} category and k denotes the number of categories for each variable of interest. Table 1 highlights the observed socio-demographic variables, their categorization, and the corresponding k value relevant for calculating the Blau index.

This index ranges from 0 (perfect homogeneity) to a maximum value that depends on the number of categories:

$$B_{max} = \frac{(k - 1)}{k} \quad (2)$$

To address biases related to absolute diversity and varying group sizes, we apply a corrected version of the Blau index (Biemann and Kearney, 2010), which adjusts the upper limit based on group size. This normalized index, shown in Equation (3), provides a consistent measure of diversity across socio-demographic variables, ranging from 0 to 1, where 1 indicates maximum heterogeneity.

$$Bn = \frac{B}{B_{max}^*} \quad (3)$$

Table 1. Socio-demographics variables and their categories

Teams size*	Gender (k = 2)	Age (k = 3)	Level of education (k = 5)	Kind of education (k = 8)	Number of other organizations founded (k = 9)	Number of management experiences (k = 13)	Number of other career experiences (k = 11)
1	Male	under 40	Secondary School	General Education	0	0	0
2	Female	40–54	Bachelor's	Engineering	1	1	1
3				Computer Science	2	2	2
4			MBA	Economics	3	3	3
5			PhD	Management	4	4	4
7				Finance	5	5	5
10				Law	6	6	6
				Other	7	7	7
					8	8	8
						9	9
						10	10
						11	
						12	

Note(s): *Categories associated with the team size variable correspond to the numerosities actually observed in the sample

Source(s): Own elaboration

where $0 \leq B_n \leq 1$

For this study, we operationalize heterogeneity across founding teams using normalized Blau indices for variables such as gender, age, education, and experience as follows (see also Table 1).

Heterogeneity in Start-up Experience. Following the approach suggested by Thiess *et al.* (2016), we explored the experience heterogeneity within the founding team by considering the founders' experience as start-uppers, managerial experiences, and other career experiences. Regarding the heterogeneity in start-up experience, we calculated the normalized Blau index associated with the number of other founded organization variables *Heterogeneity in Managerial Experiences*. We measured the heterogeneity in managerial experience by considering the normalized Blau index related to the number of management experience variables.

Heterogeneity in Other Career Experience. Finally, to measure the heterogeneity in other career experiences, we looked at the normalized Blau index related to the number of other career experience variables.

Level of Education Heterogeneity. Similarly to Pinelli *et al.* (2022), we investigated the educational heterogeneity within the founding team by capturing both the level of education achieved by the founders and their field of study. Regarding the level of education, similarly to Abatecola and Cristofaro (2016), we used five levels of education (i.e. secondary school achieved, bachelor's degree achieved, master's degree achieved, Ph.D. achieved, and MBA achieved). Therefore, to measure the level of education heterogeneity, we considered the normalized Blau index associated with the level of education variable.

Kind of Education Heterogeneity. Concerning the founders' kind of education, based on the approach adopted by Hambrick *et al.* (1996), we used eight educational background categories particularly relevant to our research (i.e. general school education, engineering, computer science, economics, management, finance, law, and other). Consequently, we computed the normalized Blau index corresponding to the kind of education variable.

Gender Heterogeneity. We measured the gender heterogeneity by considering the normalized Blau index (see Equation 3) related to the gender variable. The gender variable encapsulates whether the founders are male or female.

Age Heterogeneity. To measure the age heterogeneity, we looked at the normalized Blau index associated with the age variable. The age variable signals whether founders are young (i.e. under 40), experienced (i.e. 40–54), or senior (i.e. 55–69) (e.g. Ricciotti *et al.*, 2022).
Team Size. We counted the number of members constituting the founding team. In our sample, team size ranges from 1 founder to a maximum of 10 founders. In particular, most unicorns were founded by 3 or 2 co-founders (representing 37 and 35% of the sample, respectively).

3.4 Control variables

Because the influence of other variables might spoil our estimates, we included several control variables. Because there may be confounding effects related to the environmental and financial conditions in which start-ups operate, we controlled for *Sector of Activity*, *Geographical Area*, and *Founding Period*.

In greater detail, following the distinction operated by CB Insights (2023), we have created seven sectoral categories (i.e. consumer and retail, enterprise tech, financial services, healthcare and life sciences, industrials, media and entertainment, and insurance). Afterward, similarly to Ricciotti *et al.* (2022), we have created three geographical categories related to the Unicorns’ headquarters (i.e. Southeast Europe, North Europe, and West Europe). Finally, we have developed four categories associated with the founding period (i.e. 2002 to 2006, 2007 to 2011, 2012 to 2019, and 2020 to 2022). In fact, on the one hand, the years between 2002 and 2006 indicate the period before the 2008 financial crisis; on the other hand, the years between 2007 and 2011 indicate the period when the 2008 financial crisis manifested its effects. Similarly, while the years between 2012 and 2019 signal economic recovery, the years between 2020 and 2022 denote the period when the effects of the Covid 19 pandemic are observed. Table 2, therefore, highlights the control variables in the context of our research.

Mainly, most of the Unicorns in our sample operate in the consumer and retail, enterprise tech, and financial services sectors (representing, respectively, 29%, 27%, and 20% of the sample) and are headquartered in West and North Europe (representing, respectively, 80 and 16% of the sample). Furthermore, 68% of Unicorns in our sample were founded between 2012 and 2019, during the period of economic recovery immediately preceding the spread of the Covid 19 pandemic.

4. Results

4.1 Descriptive statistics

The analysis of descriptive statistics is provided here to provide a comprehensive framework for understanding the characteristics and dynamics of the analyzed Unicorns, uncovering trends and critical insights.

Table 3 provides insights into a series of characteristics that go in-depth into the representation of the founding team of the investigated ventures and some specificities of the investigated Unicorns themselves. Specifically, this table provides descriptive statistics on

Table 2. Control variables

Sector of activity	Geographical area	Founding period
Consumer & Retail	Southeast	2002–2006
Enterprise Tech	North	2007–2011
Financial Services	West	2012–2019
Healthcare & Life Sciences		2020–2022
Industrials		
Media & Entertainment		
Insurance		
Source(s): Own elaboration		

Table 3. Descriptive statistics

Firm or founder feature(s)	Frequency
<i>Sector of activity</i>	
Consumer & Retail	29%
Enterprise Tech	27%
Financial Services	20%
Healthcare & Life Sciences	5%
Industrials	13%
Media & Entertainment	4%
Insurance	1%
<i>Geographical area</i>	
West	80%
North	16%
Southeast	4%
<i>Founding period</i>	
2002–2006	4%
2007–2011	20%
2012–2019	68%
2020–2022	8%
<i>Team size</i>	
Solo founder	13%
Two founders	35%
Three founders	37%
Four and more founders	15%
Mean	2.65
<i>Gender</i>	
Male	96%
Female	4%
<i>Age</i>	
Under 40	43%
40–54	53%
55–69	5%
<i>Level of education</i>	
MD	39%
BD	37%
PhD	11%
MBA	11%
Secondary School	3%
<i>Kind of education</i>	
Management	41%
Computer Science	23%
Engineering	12%
Other	12%
Finance	7%
General School education	3%
Economics	2%
Law	2%
<i>Start-up experience (Number of other organizations founded)</i>	
0	50%
1	29%
2	12%
3	5%
4 or more	5%

(continued)

Table 3. Continued

Firm or founder feature(s)	Frequency
<i>Number of management experiences</i>	
0	39%
1	20%
2	13%
3	14%
4 or more	14%
<i>Number of other career experiences</i>	
0	32%
1	30%
2	15%
3	14%
4 or more	9%

Unicorns’ founding teams’ socio-demographic characteristics, such as team size, gender, age, level, and kind of education, as well as information about the previous experiences of each team component. The table also provides descriptions regarding the sector of activity, the geographical location, and the founding period of the Unicorn ventures investigated.

Considering the *sector of activity and geographical area*, from [Tables 3](#) and it emerges that the analyzed Unicorns are distributed across different industries, with a notable presence in consumer-related sectors (29%), technology (27%), and finance (20%). European western regions are those in which these Unicorns are mainly located (almost 80% of the total), reflecting the differences among types of local entrepreneurial ecosystems that are particularly active and supportive in stimulating entrepreneurial innovation in many ways (e.g. using innovation hubs of via *ad hoc* resources), driving high levels of start-up activities.

Looking at the *founding period*, it is worth noting that almost 68% of the analyzed Unicorns were founded in 2012–2019. Interestingly, 8% of these ventures have been established very recently, between 2020 and 2022, demonstrating the adaptability and resilience of European entrepreneurs amidst changing and rapidly evolving market conditions and external disruptions such as those faced recently at the global level. From the sample, 15% of Unicorns reached their status before 2020, 15% in 2020, 50% in 2021, and 20% in 2022, highlighting a significant peak in 2021.

Considering the *team size*, data show that, on average, European unicorns are characterized by small-sized teams with a size mean of fewer than three members (i.e. 2.65).

From [Table 3](#), a significant gender disparity emerges among founders of European Unicorn ventures, with 96% male and only 4% female. This imbalance reflects broader systemic issues regarding gender representation and equality in the entrepreneurial landscape.

Regarding the *age* of the founding team, even if the majority (53% of the total) of individuals that have founded a Unicorn venture fall within the age range of 40–54, there is, however, a significant proportion of under 40 founders (43% of the total) and this, in contrast to the tiny percentage of founders aged between 55 and 69, suggests a general prevalence of younger entrepreneurs in driving Unicorn ventures.

When considering the *level and kind of education*, descriptive statistics show that the most common level among European Unicorns’ founders is a Master’s Degree (MD), with Management and Computer Science being the most common fields of study. It is worth mentioning that 22% of the founders hold a PhD or a Master of Business Administration (MBA), suggesting a strong academic background among founders.

Of interest to notice is the fact that, if we consider the *start-up experience*, half of the founders belonging to the dataset are first-time entrepreneurs, as they did not have any

previous experience in creating ventures and, in 39% of cases, they did not even have, at the moment the Unicorn was made, any kind of previous *management experience* or *other career experiences* at all (32% of cases). A substantial number of founders have had one or more management experiences before creating the Unicorns object of investigation and, also, the majority of founders (68%, as from Table 3) have had at least one other career experience before starting their Unicorn venture's experience, indicating a diverse background among entrepreneurs, with varying levels of prior professional exposure before venturing into start-ups.

4.2 Hypotheses testing

Results from Table 4 show the bivariate correlations among our variables, meaning the statistical relationships between each pair of variables adopted in this study. These correlations are specifically measured using Pearson's correlation coefficient, which ranges from -1 to 1 . In the case of this study, in particular, results from this analysis show that, at an overall level, correlations are low, except for those between *Time-to-Unicorn Status* and *Founding Period* (-0.871^{**}), meaning that firms born in more recent times are those able to achieve the Unicorn status faster, likely due to advancements in technology, greater access to capital, and favorable market conditions.

Table 5 showcases the results of the application of Cox's regression models. A first specification needed is that, since all ventures in the dataset reached the valuation of \$1 billion within the observed period, right censoring was not a concern for the authors.

Model 1 considered the control variables, explicitly referring to the observed Unicorns' industries, geographical areas, and founding periods. The omnibus test of coefficients reveals the overall significance of the model ($\chi^2 = 440.031$, $df = 3$, $p < 0.001$), indicating that the included control variables collectively contribute to explaining the time-to-Unicorn status dimension.

In Model 2, the association between five independent variables (experience, education, gender, age, team size) and the dependent variable of interest – the time taken to achieve unicorn status – is further explored. This stage further validates the significance of the model and evaluates the impact of the newly added variables ($\chi^2 = 432.994$, $df = 11$, $p < 0.001$).

Regarding the control variables, results show that the Sector of Activity and Geographical Area do not significantly impact the duration of achieving unicorn status. This suggests that sectoral and regional differences may not substantially influence venture success trajectories in this context. *Founding Period*, instead, exhibits a statistically significant effect on the duration to achieve unicorn status ($\beta = 3.255$, $p < 0.001$). It means that ventures established in later periods take longer to reach Unicorn status, suggesting that the competitive landscape or other external factors may have evolved, impacting the growth trajectory of these ventures.

Regarding the independent variables, none of the experience variables showed statistical significance concerning the duration required to achieve unicorn status; however, the positive sign registered for the β values suggests that having a variety in the range of expertise and skills among team members may contribute positively to the venture's rapid growth. Concerning education, the *Level of Education Heterogeneity* influences the time it takes for ventures to become unicorns ($\beta = 0.444$, $p < 0.1$). Ventures with founders having different levels of education take longer to achieve unicorn status, possibly due to the challenges associated with integrating diverse knowledge bases and perspectives. The *Kind of Education Heterogeneity* also influences the time it takes for ventures to become unicorns ($\beta = -0.619$, $p < 0.1$). The negative coefficient indicates that greater diversity in educational backgrounds within founding teams is associated with a shorter time to achieve unicorn status. Concerning *gender heterogeneity*, it does not influence the time it takes for ventures to become unicorns. This result can be explained by the deficient representation of women in the analyzed founding teams. However, the negative coefficient suggests that higher levels of gender heterogeneity

Table 4. Correlation matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1 Time_to_Unicorn_Status	1											
2 Sector_of_Activity	−0.049	1										
3 Geographical_Area	−0.105	0.042	1									
4 Founding_Period	−0.871**	0.048	0.099	1								
5 Team_Size	−0.195	−0.079	0.054	0.204	1							
6 Gender_H	0.252*	−0.120	−0.111	−0.203	0.219	1						
7 Age_H	−0.095	0.137	0.154	0.137	0.414**	0.050	1					
8 LoE_H	−0.165	0.013	0.023	0.077	0.277*	0.108	0.111	1				
9 KoE_H	−0.066	−0.040	−0.009	0.108	0.177	−0.036	0.046	0.313**	1			
10 SUE_H	−0.153	−0.009	0.022	0.175	0.157	0.009	0.106	0.182	0.321**	1		
11 ME_H	−0.119	−0.037	0.135	0.141	0.254*	0.009	0.232*	0.247*	0.308**	0.494**	1	
12 OCE_H	−0.085	0.027	0.024	0.102	0.318**	−0.054	0.110	0.226	0.421**	0.317**	0.120	1

Note(s): *** $p < 0.01$ ** $p < 0.05$ * $p < 0.1$

Table 5. Cox's regression model

Variables	Model 1			Model 2			Model 3		
	Coefficient	Standard Error	<i>p</i> -value	Coefficient	Standard Error	<i>p</i> -value	Coefficient	Standard Error	<i>p</i> -value
Sector of Activity	−0.015	0.81	0.852	−0.006	0.088	0.946	−0.019	0.085	0.819
Geographical Area	0.127	0.248	0.608	0.074	0.255	1.077	0.061	0.254	0.811
Founding Period	3.211***	0.528	<0.001	3.255***	0.538	<0.001	3.250***	0.539	<0.001
Management Experience (H)				−0.150	0.371	0.686	−0.177	0.367	0.628
Other Career Experience (H)				0.055	0.386	0.888	0.036	0.386	0.925
Start-Up Experience (H)				0.309	0.363	0.396	0.312	0.364	0.392
Level of Education (H)				0.444***	0.318	0.003	0.457***	0.317	0.004
Kind of Education (H)				−0.619*	0.359	0.084	−0.623*	0.359	0.083
Gender (H)				−0.792	0.579	0.171	−0.822	0.574	0.152
Age (H)				−0.204	0.389	0.600	Not included	Not included	Not included
Team Size				0.227*	0.132	0.086	0.207***	0.127	0.001
Chi-square	51.948			59.499			59.499		
Log-likelihood	441.412			433.273			433.273		

Note(s): Robust *p*-values were provided in parentheses: ****p* < 0.01 ***p* < 0.05 **p* < 0.1

within founding teams are associated with decreased time to become a unicorn. Also, *age heterogeneity* does not significantly affect the time needed to achieve unicorn status.

Finally, *team size* exhibits a statistically significant effect on the duration to achieve unicorn status ($\beta = 0.227, p < 0.1$). This result means that ventures with larger founding teams tend to take longer to reach unicorn status, potentially due to the increased complexity of decision-making processes, coordination challenges, or conflicts within larger teams.

In Model 3, we conducted a Cox regression analysis, incorporating solely time-invariant variables, to assess the potential influence of time-dependent variables on our findings. It found no differences compared to earlier models, indicating that the results primarily depend on characteristics that do not change over time.

5. Discussion

This study provides novel insights into entrepreneurship literature by examining the impact of founding team heterogeneity on the time to achieve Unicorn status. Our findings, as shown in Table 6, challenge some conventional assumptions and offer explanations for these results.

First, finding that none of the founders' experience-related heterogeneity variables were statistically significant was unexpected. Previous research suggests that team heterogeneity can impact performance (e.g. [Thiess et al., 2016](#); [Zhang and Wang, 2017](#)), but our results indicate otherwise. This lack of significance may be due to the high degree of homogeneity in the founding teams' experiences—such as prior entrepreneurial activity, management tenure, or industry-specific expertise—limiting the variation necessary to produce differential outcomes. When team members possess similarly structured career backgrounds, the potential cognitive diversity and learning complementarities derived from experience heterogeneity may be muted. These counterintuitive results suggest that when experience-based capital is evenly distributed, the marginal benefits of diversity may diminish. Prior works similarly highlight that the value of experiential heterogeneity depends on the degree of variation and the quality of integration within the team ([Marvel and Lumpkin, 2007](#); [Carpenter and Fredrickson, 2001](#)). Without these conditions, experience diversity may not significantly alter the timing of strategic milestones. Additionally, team process research indicates that unless differences are meaningfully activated through coordination and deliberation ([Knight et al., 1999](#); [Williams and O'Reilly, 1998](#)), they may exert little influence on growth speed.

Second, our results are consistent with prior findings ([Ensley et al., 1998](#); [Pinelli et al., 2022](#)) that educational heterogeneity can have mixed effects on firm performance, depending on how well teams integrate and leverage diverse knowledge bases. Ventures with founders having diverse education levels take longer to achieve Unicorn status, likely due to challenges in integrating different cognitive frameworks. These challenges can slow decision-making and coordination, as team members may have varying approaches to problem-solving ([Simons et al., 1999](#); [Knight et al., 1999](#)). Although educational diversity introduces varied intellectual and cognitive resources, difficulties in communication, misalignment of interpretive lenses, and lack of integration can extend scaling timelines. While prior work emphasizes the innovation potential of cognitive diversity ([Carpenter and Fredrickson, 2001](#)), our findings suggest that these advantages may come at the cost of delayed execution unless diversity is meaningfully harnessed. By contrast, heterogeneity in educational type—that is, disciplinary background—was associated with a shorter time-to-Unicorn. This suggests that functional diversity across domains (e.g. engineering, business, design) may enhance early-stage adaptability and problem-solving by offering complementary perspectives, provided that such diversity does not create insurmountable coordination burdens. Our findings therefore highlight the importance of distinguishing between types of educational diversity, as their effects on venture speed are not uniform.

Contrary to our initial hypotheses, neither gender nor age heterogeneity significantly affects the time to achieve Unicorn status. Specifically for gender, this diverges from studies reporting performance effects (e.g. [Mauro et al., 2023](#)) but aligns with [Laique et al. \(2023\)](#),

Table 6. Comparison of results with prior Unicorns' literature

Factor	Previous results	Findings in this work
Experience Heterogeneity	• Kotha et al. (2022): Founders' experience significantly influences time-to-Unicorn status through resource pooling and partnerships • Giardino et al. (2023): Founders' experience, skills, and adaptability key for innovation • Thiess et al. (2016): Balance of management and start-up experience boosts early-stage performance • Zimmerman (2008): Functional heterogeneity increases IPO capital	<i>Not significant</i> : Greater experience heterogeneity did not lead to shorter time-to-Unicorn status, supporting faster decision-making and resource mobilization
Educational Level Heterogeneity	• Kotha et al. (2022): Educational level (doctoral degrees) showed no significant impact on time-to-Unicorn status • Ensley et al. (1998): Educational diversity negatively linked to firm growth • Zhang and Wang (2017): Educational level heterogeneity negatively affects start-up performance • Pinelli et al. (2022): Heterogeneity positively impacts funds but can negatively moderate results	<i>Significant</i> : Higher educational level heterogeneity extends time-to-Unicorn status, indicating misalignment in team expertise The greater diversity in educational type is associated with a shorter time to achieve unicorn status
Educational Background Heterogeneity	• Kotha et al. (2022): Educational background heterogeneity had no significant effect on time-to-Unicorn status • Eklund and van Criekingen (2022): Educational background heterogeneity had significant effect in becoming a gazelle • Pinelli et al. (2022): Positive impact of educational diversity on funds raised, but negative moderation when combined with other factors	<i>Significant</i> : Greater diversity in education type lengthens time-to-Unicorn status due to potential misalignment in cognitive frameworks and skills
Gender Heterogeneity	• Kotha et al. (2022): Gender heterogeneity had no significant effect on the time-to-Unicorn status • Hohl et al. (2021): Gender showed no effect on pitch success, but female founders had lower valuations • Mauro et al. (2023): Gender diversity positively correlated with financial performance in high-growth firms • Laique et al. (2023): No consistent financial relationship found	<i>Not Significant</i> : Gender heterogeneity in founders did not significantly impact time-to-Unicorn status

(continued)

Table 6. Continued

Factor	Previous results	Findings in this work
Age Heterogeneity	• Kotha et al. (2022): Age of founders did not significantly impact the time to reach Unicorn status • Richard and Shelor (2002): TMT age diversity negatively linked to ROA but positively associated with sales growth • Dagsson and Larsson (2011): Age diversity influences firm performance, particularly in larger teams • Tanikawa et al. (2017): Age diversity negatively impacts ROE.	<i>Not Significant</i> : Age heterogeneity did not significantly affect time-to-Unicorn status
Team Size	• Kotha et al. (2022): Larger founding teams present resource pooling advantages but face coordination challenges, potentially delaying Unicorn status • Miloud et al. (2012): Larger teams attract more investors • Greer et al. (2011): Larger teams are prone to internal conflicts, potentially undermining efficiency • Temel and Forsman (2022): Larger teams require coordinated strategic priorities	<i>Significant</i> : Larger founding teams lead to a longer time-to-Unicorn status due to coordination difficulties and potential conflicts within the team

who found inconclusive results. This may be due to the low representation of women in our sample, limiting the cognitive salience of gender differences. Demographic diversity often influences strategy only when it becomes psychologically or socially activated ([Carpenter et al., 2004](#)). Token presence or weak identification with demographic categories may thus mute potential effects. Similarly, age heterogeneity might hold theoretical value in expanding temporal orientation or interpretive range ([Joshi and Roh, 2009](#)), but these benefits appear contingent on team dynamics that bridge generational differences ([Williams and O'Reilly, 1998](#)).

By contrast, the founding period and team size emerged as significant predictors of time-to-Unicorn. Ventures founded more recently tend to take longer to reach this milestone, possibly due to a saturated and more competitive market landscape. Although new ventures benefit from digital infrastructure and capital access, these are offset by shorter innovation cycles, faster imitation, and resource fragmentation. Regarding team size, larger teams are capable of pooling more skills and problem-solving capacity, but this comes with coordination costs. They introduce more interpersonal and cognitive complexity, which may hinder fast decision-making. As prior work emphasizes, team size increases the diversity of values, assumptions, and strategic schemas, making integration more difficult ([Hambrick, 2007](#); [Hambrick et al., 2015](#)). [Simsek et al. \(2005\)](#) note that without behavioral integration and shared cognition, larger top teams may be slower to act decisively. Our findings extend this perspective by introducing a temporal contingency: the value of cognitive diversity or size is conditional not only on task complexity or environmental uncertainty, but also on the speed with which outcomes—like Unicorn status—are pursued.

In comparison to the work by [Kotha et al. \(2022\)](#), who did not explore internal heterogeneity in depth, including team size, we find that variation in educational levels and types prolongs time-to-Unicorn, indicating potential misalignments in expertise and decision frameworks. Our study confirms some of their results (e.g. nonsignificant gender and age

effects), but adds nuance by identifying team size and educational diversity as key compositional factors influencing venture velocity. In this way, our work expands current knowledge by highlighting how compositional attributes not only shape outcomes, but also influence the temporal dynamics of entrepreneurial success.

Overall, our research contributes to entrepreneurship theory by specifying how different forms of heterogeneity—including team size—affect not just whether but how fast startups achieve critical growth milestones. It refines Human Capital Theory by demonstrating that capital diversity can produce frictions that delay scaling, and it extends Upper Echelons Theory by emphasizing that the benefits of diversity are contingent on integration mechanisms and time-based performance pressures.

6. Implications

6.1 Implications for theory

This study offers a set of theoretical contributions that advance our understanding of how founding team composition influences the speed of scaling in high-growth ventures. Specifically, we bring new conceptual clarity to the roles of human capital heterogeneity, team structure, and temporal dynamics, integrating insights from Human Capital Theory (Becker, 1964) and Upper Echelons Theory (Hambrick and Mason, 1984; Hambrick, 2007) with recent work on scaling and entrepreneurial teams (e.g. Belitski *et al.*, 2023; Das *et al.*, 2021). By framing founder heterogeneity as a factor not only influencing *outcomes*, but also *growth velocity*, our study contributes to a more temporally nuanced understanding of team composition in entrepreneurship.

First, we extend Unicorn and scaling literature by emphasizing founding team composition as an internal determinant of time-to-scale, complementing prior studies that highlight external enablers such as market conditions, investment capital, or institutional infrastructure (Belitski *et al.*, 2023; Lazar *et al.*, 2020). While these external factors remain crucial, our findings suggest that *who* is on the founding team, and *how* heterogeneous they are across key dimensions, can critically shape the trajectory and pace of growth. Specifically, we show that heterogeneity in educational type (e.g. combining technical and business knowledge) is positively associated with faster scaling, likely due to the enhanced cognitive variety and functional complementarity such diversity offers (Jin *et al.*, 2017). Conversely, heterogeneity in educational level appears to slow down the scaling process—possibly due to difficulties in aligning expectations, establishing shared language, or navigating status hierarchies among founders (Zhang and Wang, 2017; Zhou and Rosini, 2015). These findings refine assumptions embedded in Human Capital Theory by demonstrating that not all diversity enhances productivity equally; under conditions of strategic time pressure, certain types of heterogeneity may impose more costs than benefits.

Second, our study contributes to Upper Echelons Theory by conceptualizing team heterogeneity not merely as a background condition for strategic choice, but as a mechanism with temporally contingent effects. Our results add a new temporal layer to the UET logic of how observable attributes influence decision-making through cognitive filters (Hambrick, 2007). We show that heterogeneity among founders may not influence whether a company reaches high-growth thresholds, but how rapidly it does so. This distinction is theoretically important: in fast-scaling ventures, time is often a constraining resource, shaping investor expectations, market entry opportunities, and the sequencing of internal capabilities. Our findings, therefore, support emerging perspectives that view team design as both a cognitive and temporal structure—one that enables or impedes the alignment of attention, coordination, and execution speed (Das *et al.*, 2021). By advancing this temporal interpretation, we contribute to a growing stream of work that seeks to situate executive team attributes within the pace and path-dependence of venture growth.

Third, we raise new theoretical considerations regarding the configuration and size of entrepreneurial teams. While much of the literature emphasizes that larger and more diverse teams can access broader networks and knowledge bases (Lazar *et al.*, 2020), our findings

qualify this claim. Specifically, we show that larger founding teams are associated with longer timeframes to reach Unicorn status, suggesting that coordination burdens and decision-making frictions may undermine the potential advantages of team size. These results are consistent with theoretical work on team process losses (Simsek *et al.*, 2005) and the risks of intra-team conflict in high-stakes environments (Greer *et al.*, 2011). Importantly, we do not argue that larger or more diverse teams are inherently less effective, but that their performance may be conditional on temporal alignment and integrative capacity. In high-growth environments—where responsiveness, clarity of vision, and speed of execution are essential—excessive size may reduce agility. Thus, our study contributes to refining theoretical boundary conditions around entrepreneurial team composition, suggesting that “optimal” configurations depend on both task complexity and time pressure.

In summary, this study advances theory by showing that founder heterogeneity influences not only the direction of firm outcomes, but also the velocity at which those outcomes unfold. We demonstrate that the benefits and costs of heterogeneity are contingent upon the specific form of diversity and the temporal demands associated with high-growth trajectories.

6.2 Implications for practice

Our findings offer several actionable insights for entrepreneurs, investors, and incubators/accelerators seeking to improve the design and performance of early-stage, high-growth ventures aiming for Unicorn status.

First, entrepreneurs should be highly intentional when composing founding teams. While diversity in the type of education (e.g. technical, managerial, design) appears to accelerate time-to-Unicorn by promoting complementary skills and broader strategic framing, substantial differences in education level (e.g. combining founders with only secondary education and PhDs) are associated with slower scaling. These results suggest that founding teams should strive for cognitive complementarity without excessive hierarchical or epistemic asymmetry. Entrepreneurs forming teams should therefore prioritize partners with comparable education levels but different disciplinary backgrounds. For investors, this means looking beyond resumes to assess whether educational diversity enhances or undermines collective decision-making. Skill complementarity should be weighed against potential communication breakdowns or misaligned strategic expectations.

Second, investors should reconsider their often implicit bias in favor of larger teams. Our data indicate that ventures with larger founding teams tend to take longer to reach Unicorn status—likely due to coordination costs and internal conflict. Investors should avoid penalizing solo founders, who may benefit from faster decision-making and clearer vision. When evaluating multi-founder ventures, investors are encouraged to assess not just the number of founders, but the quality of team cohesion, clarity of governance structures, and mechanisms for conflict resolution. Founders of large teams, in turn, should be encouraged to formalize roles early, adopt streamlined decision-making processes, and invest in trust-building. Incubators and accelerators can support this effort by offering targeted mentoring on team structure, role clarity, and conflict management during the pre-seed and seed stages.

Third, incubators and early-stage support organizations play a critical role in helping teams strike the right balance between diversity and cohesion. Our findings indicate that teams with a wide spread in educational levels underperform, while those combining different types of knowledge perform better. Incubators can address this by actively curating co-founder matching processes that emphasize diverse but compatible cognitive backgrounds—for example, encouraging partnerships between engineers and business graduates with comparable professional maturity. Further, given our findings that female-founded or gender-diverse teams are underrepresented in Unicorns (only 4% in Europe), incubators should explicitly support female entrepreneurship through funding access, gender-specific mentoring, and inclusive selection processes. These interventions are not just matters of equity—they may unlock untapped potential in scaling ecosystems.

Fourth, entrepreneurs should recognize that ventures founded in more recent periods face longer paths to Unicorn status, likely due to increased competition, higher investor expectations, and more complex technological landscapes. This suggests a need for sharper attention to strategic timing and market entry positioning. Entrepreneurs launching new ventures should focus on early-market signals, emerging sectoral trends, and technological inflection points to maximize traction. Investors can support this by providing timely, milestone-based funding and offering strategic positioning and market timing guidance. Accelerators can further support time-sensitive scaling by linking startups to sector-specific mentors and fast-track investment channels tailored to the dynamics of emerging industries.

In summary, entrepreneurs should carefully balance team diversity with cohesion, investors should adopt more nuanced evaluation criteria beyond founder count and credentials, and incubators should play an active role in curating compatible teams and championing inclusion. Across all stakeholders, there is a shared opportunity to rethink team design not only as a success factor—but as a determinant of growth speed in pursuing Unicorn status.

6.3 Limitations and future research

While our study provides valuable insights, it is not without limitations. One notable constraint is the reliance on cross-sectional data, which limits our ability to establish causality. Future research could benefit from longitudinal data to capture the evolving dynamics of start-up teams over time. By tracking team composition changes over time, researchers can uncover how shifts in diversity impact venture outcomes and longevity. Furthermore, our study focused primarily on European Unicorns, which may limit the generalizability of our findings to other regions or contexts. Comparative analysis could reveal cultural, institutional, and market differences that shape venture trajectories. Future studies could expand the scope to include start-ups from diverse geographical regions to uncover region-specific drivers of start-up success. Also, speaking about generalizability, we must recognize that our sample's homogeneity limits our findings' generalizability to founder populations that are more diverse regarding gender, ethnicity, age, and educational backgrounds. For example, access to networks, capital, and mentorship can vary systematically across different demographic groups, potentially influencing team formation and the time to reach unicorn status.

Another limitation of this study is the inability to meaningfully test the impact of gender diversity due to the extremely low percentage of female founders in the sample. This lack of representation restricts the ability to draw robust conclusions about the role of gender diversity within founding teams and its influence on start-up outcomes. Moreover, our analysis focused on heterogeneity within founding teams. While our study focused on demographic diversity (e.g. gender, age, and education), future research could explore other dimensions, such as cultural and cognitive diversity. A limitation of this study lies in the granularity of the data collected from the CVs of founders, which did not account for the depth and specific industry dimensions of their experience.

While our measures capture diversity in the number of experiences (breadth), they do not distinguish between variations like those experiences (e.g. roles such as mentor versus researcher) or the depth of knowledge regarding years within specific roles or industries. This lack of granularity could potentially homogenize teams that are otherwise diverse in qualitative terms and may explain some non-significant results in our findings. Future research should explore more granular measures of experience, incorporating both breadth and depth and industry-specific dimensions, to better capture the multifaceted nature of founders' backgrounds. Such an approach could provide a more nuanced understanding of how different types of experience influence team dynamics and start-up outcomes – understanding how these forms of diversity influence team dynamics and decision-making processes could provide deeper insights into the mechanisms driving start-up success.

Future research could consider deepening the founders' family history (education, socioeconomic status, entrepreneurial background). These factors can provide crucial insights into early access to social, human, and financial capital. For instance, parental entrepreneurial

background might confer tacit knowledge, valuable networks, or even early-stage funding, potentially accelerating a venture's growth (Aldrich and Cliff, 2003). Higher parental socioeconomic status or educational attainment might similarly correlate with access to elite networks and resources. Moreover, it is essential to consider founders' contributions based on equity shares: Founder equity distribution is a powerful indicator of perceived contribution, bargaining power, and incentive alignment within the founding team (Wasserman, 2017). Differences in equity can influence team dynamics, commitment levels, and strategic decisions, which in turn can affect the speed of growth.

Finally, investigating the influence of external factors, such as local entrepreneurial ecosystems, regulatory environments, and access to support networks, could enrich our understanding of how start-ups navigate and leverage external resources to achieve Unicorn status. In this line, future research could investigate how industry context moderates the relationship between team heterogeneity and the time it takes for a venture to achieve unicorn status. A comparative study among industries with specific characteristics (i.e. high regulation in Fintech, deep scientific capital in Biotech) could provide valuable insights for founders and investors.

7. Conclusion

This study investigated the extent to which founding team heterogeneity influences the time required for European start-ups to achieve Unicorn status. Our findings offer new insights into the temporal dynamics of start-up success, emphasizing how team composition, size, and timing intersect to shape the pace of venture growth.

First, our results highlight the nuanced role of educational diversity within founding teams. Specifically, heterogeneity in educational type (e.g. combining technical and managerial expertise) is associated with faster scaling, likely due to the benefits of complementary skills and problem-solving perspectives. In contrast, heterogeneity at the educational level appears to hinder growth, potentially due to challenges in communication, alignment, and decision-making cohesion. These findings underscore the importance of balancing cognitive diversity with operational compatibility in team formation.

Second, team size emerges as a key determinant of time-to-scale. Despite offering broader skill sets and resource access, larger founding teams are associated with slower trajectories to Unicorn status. This likely reflects increased coordination costs, decision-making complexity, and potential for internal conflict. Entrepreneurs and investors should carefully weigh the trade-offs between functional diversity and organizational agility when structuring founding teams.

Third, the study finds that ventures founded more recently tend to take longer to achieve Unicorn status. This result points to the evolving challenges in today's entrepreneurial landscape, where intensified competition, rapid technological change, and investor scrutiny may extend the growth path, even in resource-rich environments.

These findings contribute to Unicorn literature by introducing a temporal perspective on how founding team heterogeneity, size, and founding period affect scaling outcomes. Our study refines theoretical expectations by focusing on the speed of venture growth rather than success in binary terms. It offers practical guidance for team formation, investment decisions, and incubation strategies.

AI statement

During the preparation of this work, the author(s) did not use any generative AI and AI-assisted technologies in scientific writing.

Notes

1. The Organisation for Economic Co-operation and Development defines gazelles as "enterprises up to 5 years old with average annualized growth greater than 20% per annum, over a three-year period" (OECD, 2007, p. 63).

2. Specifically: “knowledge is the declarative or procedural information necessary for performing a task and the foundation on which skills are developed (knowledge may apply to many jobs or only a single job), skills are the individual’s level of proficiency and capabilities to perform specific tasks and can be improved with experience, ability is a more enduring capability that is applicable to a range of job-related tasks, and other characteristics refers to personality traits and related dispositional attributes that affect the individual’s performance across a broad range of tasks” (Ployhart *et al.*, 2014, pp. 376).

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Further reading

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