Does Gender and Nationality Diversity Imply in Innovation Performance?

Abstract

This study explores the impact of gender and nationality diversity within startup founding teams on performance. Utilizing a dataset of 13,355 companies and 27,277 founders, we run linear and logistic regression models to investigate how diversity influences operational status, strategic exits, total funding amount raised, and the number of funding rounds. Gender diversity showed a non-significant effect on operational status but decreased the probability of strategic exits by 33%. Additionally, founder-teams with women received $1.48 million less in funding compared to all-male teams. Nationality diversity, on the other hand, increased the probability of a company being active by 65% and was associated with more funding rounds, though not a higher total funding amount. These results underscore the need for a balanced approach in the startup ecosystem, recognizing both the potential drawbacks and advantages of diverse founding teams.

Keyword: Gender Diversity; Nationality Diversity; Founder team; Entrepreneurship; Innovation; Venture Funding.

1. Introduction

According to McKinsey & Co's 2023 report titled "Diversity Matters Even More: The Case for Holistic Impact," companies boasting diverse leadership teams consistently demonstrate higher financial returns (Huang, Battisti e Pickernell, 2023; Dwyer, Richard e Chadwick, 2003). The report underscores that for companies excelling in gender representation, there exists a notable 39 percent likelihood of outperforming their bottom-quartile counterparts. This trend persists across various industries and is equally observable in ethnic diversity metrics. Recognizing the potential for enhanced financial performance, scholars and researchers are actively engaging in academic inquiries to explore the multifaceted impacts of diversity (e.g. Sundermeier e Mahlert, 2022; Calder-Wang et al., 2023).

Diversity can be construed as a multifaceted framework encompassing three fundamental dimensions: organizational, external, and internal (Sundermeier e Mahlert, 2022). These dimensions encapsulate a total of twenty-three sub-dimensions, including variables such as age, gender, ethnicity, race, educational background, and work experience, among others. Furthermore, diversity can also be analyzed through three disciplinary lenses: economic (Schumpter, 1934), sociological, and psychological (Knippenberg, Van, Dreu, De e Homan, 2004; O' *et al.*, 1989). Sociological and psychological perspectives delve into diversity by examining phenomena such as homophily, social identity, and cognitive categorization, thereby offering extensive empirical insights into the underlying mechanisms shaping the outcomes of diversity within work groups (Sundermeier e Mahlert, 2022). In the economic domain, attention is directed toward the varied resources and distinct capabilities contributed by founders or members within an organization. (Beckman e Burton, 2008; Hoogendoorn, Parker e Praag, van, 2017).

However, these three perspectives economic, sociological, and psychological are not equally explored, and the effects of diversity could be a double edge sword entailing both benefits and costs (Brixy, Brunow e D'Ambrosio, 2020). When managers, teams, and scholars engage in discussions regarding diversity within organizations, they often prioritize its potential impacts on facets such as innovation, social cohesion, collective problem-solving efficacy, and analytical thinking. This emphasis stems from the inherent difficulty in directly observing or attributing diversity to indicators like financial performance, particularly within the context of large corporations. Additionally, the effects of diversity on the same performance attribute can vary, being positive, negative, or non-significant, suggesting that diversity indeed operates as a double-edged sword. For instance, from the perspective of internal diversity dimensions, diversity might potentially undermine team communication (Croning et al., 2007), cooperation (Chatman et al., 2001), and cohesion (Finkelstein, Hambrick, & Cannella, 2009), while simultaneously contributing to enhanced idea generation, decision-making, and problem-solving (Wang, Cheng, Chen, & Leung, 2019; Stahl, Maznevski, Voigt, & Jonsen, 2010; Milliken & Martins, 1996).

Given its intricate nature, the innovation industry serves as a pertinent testing ground. Firstly, within the entrepreneurship landscape, which witnessed approximately US$241 billion of venture capital investments in 2022 according to STATISTA (2023),

issues of underrepresentation loom large. Firms founded by Black and Latino individuals received merely 1 percent and 1.5 percent of total US venture capital (VC) funding respectively, underscoring a pervasive disparity. This underrepresentation extends beyond ethnicity to encompass women-founded companies, which secured only 1.9 percent of the total VC funding, persisting across all stages of growth. (McKinsey&Co, 2023). Secondly, startups possess several crucial attributes that render them an ideal environment for exploring the performance implications of diversity. Founder teams in startups typically comprise fewer members compared to established organizations, making it easier to discern and leverage the human capital contributions, such as skills, abilities, and knowledge (Becker, 1964), which often lead to superior results. Finally, in startups, decision-makers (founders) and performance metrics (e.g., deal-level outcomes, fund-level returns, IPO success, time to market) can be precisely assessed (e.g., (Calder-Wang e Gompers, 2021); (Beckman, 2016); (Chandler, Honig e Wiklund, 2005)).

In alignment with the ongoing contextual discourse, this study seeks to leverage data from 13,355 start-up companies and their founders as pivotal sources of insight to delve into the ramifications of internal diversity on performance. Specifically, this paper aims to scrutinize how gender and nationality, both considered exogenous variables, within the cohort of company founders across diverse industries and regions within the United States innovation market, influence performance metrics such as the probability of achieving strategic exits like IPOs or M&As, the capacity of being active (operational status) – which directly impacts the capacity of founder teams to leverage diversity— and the amount of funding raised, a variable that may expose underlying biases in investment opportunities.

This analysis is conducted while controlling for other pertinent variables, including company sector, operational tenure, headquarters geographical location, and the academic and professional backgrounds of founders.

Within this analytical framework, this article yields several noteworthy contributions. From an academic perspective, it enriches the documentation of theory through an economic lens, a domain that has produced fewer findings compared to sociological and psychological perspectives, thus deepening our comprehension of the financial ramifications of diversity. For practitioners, it underscores the critical role of contextual

considerations in optimizing the benefits of diversity while mitigating potential biases in funding allocation processes. Lastly, for venture capitalists and managers, it underscores the intrinsic financial value of diversity, emphasizing that diversity can indeed translate into enhanced profitability.

2. Literature Review

2.1. The Context of Diversity

Diversity is a multifaceted construct that describes the heterogeneity of individuals in relation to specific characteristics (Kolmann et al., 2017; Van Knippenberg et al., 2004). In newly founded firms, there are low impediments to the effects of diversity, bringing entrepreneurial teams a unique context for studying diversity among team members (Ensley et al., 2006; Welter et al., 2017) especially because on a team level, this refers to 'the distribution of differences among members of a unit with respect to a common attribute' (Harrison & Klein, 2007, p. 1200).

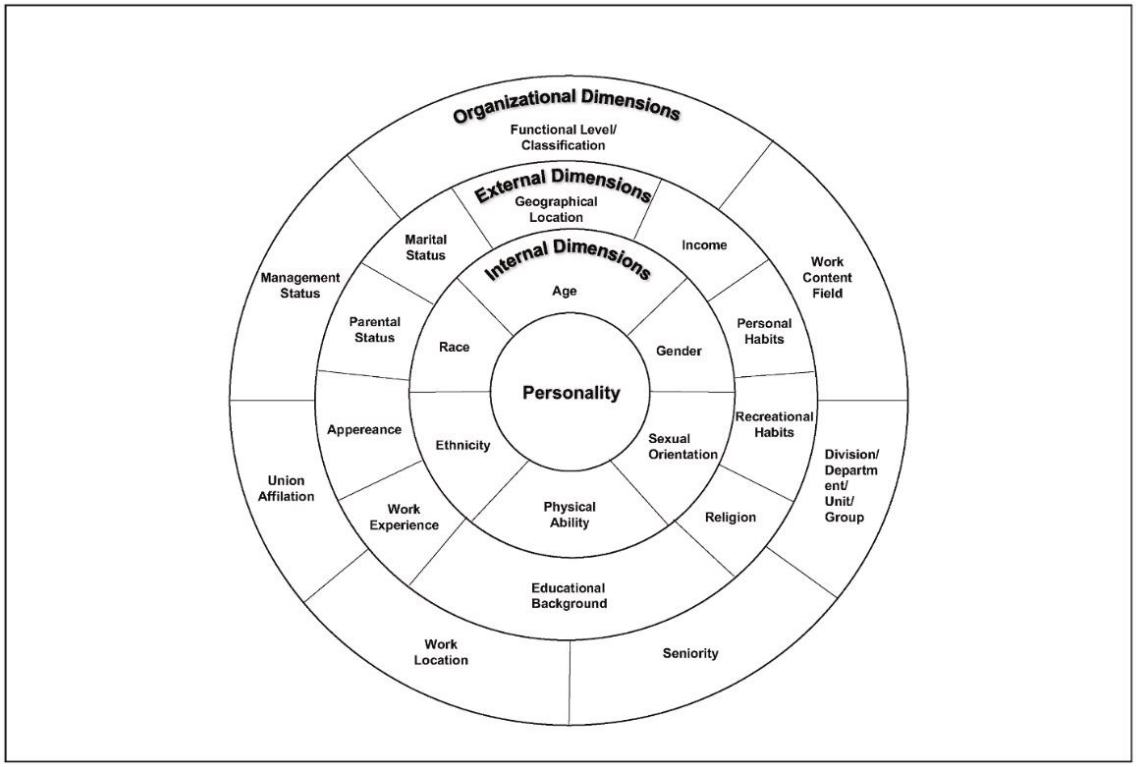
The dimensions of this construct can be divided into *demographic*, related with to gender, race, age, sexual orientation, physical abilities and ethnicity; *functional*, related to educational background, skills, work experience (Van Knippenberg & Schippers, 2007) and; *deep-level* diversity that is related with personality traits, values and beliefs, etc (Sundermeier & Mahlert, 2022). These dimensions were captured by Gardenswartz and Rowe (1994) through a four-layer dimension framework: personality, internal, external, and organizational (see Figure 1).

The central layer, *personality*, describes characteristics of individuals that are mostly unobservable, such as personality traits, values, and beliefs. The next layer, *internal dimensions*, covers the common demographic attributes, such as age, sexual orientation, gender, ethnicity, physical abilities, and race. The third layer, *external dimensions*, express more contextual than individual attributes of diversity (differently from the first and second dimensions). Here are contemplated marital status, geographical location, income, personal habits, recreational habits, religion, educational and work experience background, and parental status. And lastly, the

organizational dimension refers to work field, department unit, seniority, management status, and union affiliation.

Figure 1: The Four Layers of Diversity by Gardenswartz and Rowe (1994, p. 33)

For the purpose of this paper, this framework helps to understand that diversity is



multiple and, here the focus lies on two types of internal diversity dimensions: gender and ethnicity detailed further, according to the objective of this work to correlate diversity with venture performance.

2.2. Innovation Context and Founder Teams

Recognizing the pivotal role of human capital in entrepreneurial success, Schumpeter (1934) characterizes entrepreneurs as individuals possessing specialized abilities, including knowledge, foresight, and leadership skills. These individuals are central to introducing innovation, thus serving as essential drivers of competitiveness and economic change, and occupying a decisive role in economic development (e.g., Chaganti et al., 2008; Dai et al., 2019; Zhou et al., 2015; Sledzik, 2013).

The composition of founding teams in new ventures holds the potential to shape business growth, as team members influence strategies, make critical decisions, and

manage the culture and structure of the new venture. However, findings regarding the relationship between founder team diversity and performance do not consistently yield positive outcomes.

Studies shed light on relational aspects, frequently invoking the concept of homophily—the tendency to associate with individuals who share similar characteristics (e.g., Gompers et al., 2016). Teams characterized by higher levels of homogeneity typically exhibit more favourable and efficient processes. Conversely, higher levels of diversity tend to impede integration and foster interpersonal conflicts, thereby diminishing team performance (Khan et al., 2015; Kollmann et al., 2017).

By the other side, the pronounced presence of diversity within founder teams suggests positive outcomes for decision making process. This perspective posits that heterogeneous teams possess a broader range of task-related knowledge, skills, and abilities, which positively influence group processes, often manifested through the outcomes of activities requisite for entrepreneurial teams (Beckman, 2016; Khan et al., 2014). Furthermore, the effect of venture performance is contingent upon contextual factors, such as environmental variables, shared purpose, and the desired level of performance (Zhou et al., 2015). It is often suggested that as entrepreneurial firms evolve and mature, they need to attract individuals with diverse skills (Aldrich, 1999; Boeker & Karichalil, 2002).

Founder teams in startups typically comprise fewer members compared to established organizations, making it easier to discern and leverage the human capital contributions, such as skills, abilities, and knowledge (Becker, 1964), which often lead to superior results (e.g., Bragunsky & Hounshell, 2016). Moreover, in startups, decision-makers (founders) and performance metrics (e.g., deal-level outcomes, fund-level returns, IPO success, time to market) can be precisely assessed (e.g., Calder-Wang e Gompers, 2021; Beckman, 2016; Chandler, Honig e Wiklund, 2005).

At its core, entrepreneurs challenge the status quo by introducing new, radical, and distinct products, services, and processes. Entrepreneurial innovation is even regarded as the primary source of national competitive advantage, disrupting established patterns (Baumol, 2002). This agenda has the potential to introduce significant societal changes, such as artificial intelligence, personal computers, and biotechnology (Scherer, 1980).

Furthermore, it is crucial to acknowledge that entrepreneurial ecosystems play a pivotal role in regulating the direction and quality of entrepreneurial innovation. They shape the trajectory and potential rewards of alternative technological developments, as well as the types of organizational forms deemed legitimate (Wright et al., 2015). The size of the entrepreneurial sector is bolstered by both formal and informal institutions, including the state, universities, investors, and a rich network of professional intermediaries. These institutions are facilitated by legal and economic frameworks, adopting policies aimed at stimulating innovation to foster economic growth. This is evident in initiatives at the local, regional, and national levels that promote university-based start-ups, as well as government programs and incubators/accelerators, particularly in developed markets (Grimaldi et al., 2011). These initiatives contribute to the creation of innovation networks (Dodgson et al., 2008), institutional adaptability (Dodgson, 2009), and national innovation systems (Intarakumnerd, Chairatana, & Tangchitpiboon, 2002; Kanter, 2012).

It is also important to note that the innovation industry is continuously growing. A report produced by Silicon Valley Bank (2022) indicates that investment into startups in the United States increased at all stages in 2022. This sector mobilizes significant amounts of capital; compared to 2021, pre-seed valuations grew by 18.8% in 2022 to $11M. Seed-stage valuations grew by 43.7% to $30.6M, Series A valuations grew by 21.3% to $104.3M, and Series B valuations grew by 9.7% to $340.8M. However, these increases are contingent to some variables.

Within the entrepreneurship landscape, which witnessed approximately US$241 billion in venture capital investments in 2022 according to Statista (2023), issues of underrepresentation loom large. Firms founded by Black and Latino individuals received merely 1 percent and 1.5 percent of total US venture capital (VC) funding, respectively, underscoring a pervasive disparity. This underrepresentation extends beyond ethnicity to encompass women-founded companies, which secured only 1.9 percent of the total VC funding, persisting across all stages of growth (McKinsey & Co, 2023). This underscores the importance of deeply investigating the implications of gender and ethnicity diversity within the innovation sector.

The significance of founder teams in their ability to influence strategic decision-making and implementation (Burgelman, 1996; Floyd & Wooldridge, 1992; Kanter,

1982) underscores the necessity of focusing this paper's literature review on the existing knowledge of Top Management Teams' (TMTs) capacity to leverage gender and nationality diversity. The rationale for selecting gender and nationality diversity as critical variables for correlation with business performance is grounded in their potential to yield valuable insights from an economic disciplinary perspective. Both gender and nationality are exogenous variables, meaning they originate from external factors, allowing for a more precise examination of their effects on business outcomes.

Overall, while social justice typically serves as the initial impetus behind efforts to enhance inclusion and diversity, companies have increasingly begun to regard gender and ethnicity diversity as sources of competitive advantage and key enablers of growth (McKinsey & Co, 2017). Therefore, setting this agenda as important is crucial for fostering a more inclusive and prosperous entrepreneurial ecosystem.

2.3. Gender

Gender diversity refers to the presence of both men and women in a founding team, bringing together a range of perspectives and strengths. Teams with gender diversity can benefit from the variety in cognitive approaches that individuals of different genders bring. Research suggests that men and women often approach information processing differently, with men tending to focus selectively on key details (*selective)*, while women often take a broader, more *comprehensive* view. (Putrevu, 2001; Chung & Monroe, 1998; Darley & Smith, 1995; Huang, Battisti e Pickernell, 2023).

The correlation between gender diversity and business performance is subject to variability. Research by Miller et al. (1998) revealed that cognitive heterogeneity among executives could impede, rather than enhance, long-term planning. The authors suggested that divergent opinions resulting from heterogeneity might lead to disagreement among executives, making it challenging to reach consensus on strategic decisions, thereby hindering the organization's ability to effect change. This finding aligns with reviews of team diversity, including gender diversity, which have

indicated that diversity can pose challenges related to cohesion, cooperation, and decision-making processes within teams (Webber et al., 2001; O'Reilly et al., 1998).

Conversely, the notion that diverse groups can foster skill complementarity and offer a broader spectrum of knowledge, information, and perspectives persists when compared to homogeneous groups. Gender-diverse teams have been shown to generate more innovative solutions (Jackson, 1992), foster innovation (Miller and Triana, 2009; Torchia et al., 2011), and reduce investment errors, thereby enhancing returns (Calder-Wang et al., 2023). Moreover, these effects are particularly pronounced when women possess technical backgrounds, attaining legitimacy as entrepreneurial leaders, and when the team is led by women (Calder-Wang et al., 2023; Tinkler et al., 2015).

Additionally, literature indicates that females are more inclined than males to engage in relational information processing, which emphasizes identifying similarities among disparate pieces of information. This preference for relational information processing enables female team members to effectively connect, integrate, and utilize information and ideas dispersed within and beyond the founding team. Consequently, gender diversity is positively associated with the innovation performance of new ventures (Dai, Byun, & Ding, 2019).

From a financial perspective, Herring’s (2009) research found that gender diversity is associated with increased sales revenue, a larger customer base, greater market share, and higher relative profits. His findings align with the argument that a diverse workforce benefits business, offering a direct return on investment and leading to higher corporate profits and earnings. This internal organizational perspective supports the idea that growth and innovation depend directly on people from various backgrounds working together and capitalizing on their differences. Although these differences may lead to communication barriers and group conflicts, as previously mentioned, they ultimately enhance the organization's overall performance.

Another study conducted by Zhang (2020) found that as gender diversity becomes normatively accepted in a country or industry, more gender-diverse firms experience positive market valuation and increased revenue. This study aligns with findings from Somlinski et al. (2023), which identified a positive relationship between gender diversity and firms' profitability, liquidity, and growth, supporting the idea that

the *presence of gender diversity is positively associated with improved performance outcomes.*

On the other hand, examining the side of financial supply perspective for new ventures, reveals that gender diversity can negatively impact the total amount of funding received by new venture firms due to *homophily* bias—the tendency to establish connections with those similar to ourselves. Cohen et al. (2018) observed a phenomenon called "birds of a feather," indicating that venture capitalists prefer to hire, invest in, or co-invest with individuals who share similar characteristics such as gender and ethnicity. Moreover, Gompers et al. (2016) demonstrated that co-investment patterns in venture capital are driven by social similarities; venture capitalists who are more similar in gender, ethnicity, school background, and work history are more likely to collaborate. Consistent with these findings, Ewens and Townsend (2020) discovered gender segregation on AngelList, where male investors show a greater interest in male-founded companies, supporting the idea that *the presence of gender diversity is negatively associated with receiving investment opportunities (e.g total funding amount received or, the number of funding rounds).*

This leads to our first and second hypothesis:

Hypothesis 1: The presence of gender diversity in startups founder team is positively associated with improved performance outcomes.

Hypothesis 2: The presence of gender diversity in startups founder team is negatively associated with the total funding amount received and the number of funding rounds.

2.4. Nationality

Nationality diversity delineates the degree to which founding team members originate from diverse cultural backgrounds. For this article, nationality diversity is considered analogous to ethnic diversity, as both relate (in some level) to shared cultural heritage, traditions, and practices. Cultural backgrounds impart distinct sets of values and beliefs (Hofstede, 2001), shaping decision-making processes and behaviors (Schwartz, 2012). Nationality influences individuals' perceptions and interpretations of environmental cues, subsequently influencing their responses to

strategic issues (Schneider & De Meyer, 1991). Like gender diversity, culturally diverse teams enhance group decision-making and mitigate groupthink (Maznevski, 1994), offering varied perspectives and generating a wider array of solutions to identified challenges (Watson, Kumar, & Michaelsen, 1993). Research on nationality diversity suggests that founders adopt diverse strategies related to market entry (Chaganti et al., 2008), internationalization (Jiang et al., 2020), and innovation (Brixy, Brunow & D'Ambrosio, 2020), thereby fostering new product innovation and firm performance (Nathan & Lee, 2013; Nielsen & Nielsen, 2013). A meta-analysis of multicultural groups by Stahl et al. (2010) corroborates that cultural diversity amplifies team creativity.

However, from a self-categorization perspective (Williams & O'Reilly, 1998), cultural diversity may precipitate relationship conflicts within the founding team, hampering group decision-making quality (de Wit, Greer, & Jehn, 2012).

Furthermore, while cultural diversity may present both advantages and drawbacks for the founding team, it is posited that nationality diversity may accentuate its effects compared to gender diversity. Variations in national origin often entail disparities in values and cognitive frameworks (Hambrick et al., 1998), as well as divergent understandings and communication styles (Liao et al., 2011). Nonetheless, nationality often brings cultural understanding and social networks that serve as valuable "task-oriented" resources, especially in tasks involving "boundary spanning" (Caligiuri et al., 2004; Barkema and Shvyrkov, 2007). If diverse teams can surmount challenges related to trust-building and communication, the cognitive and resource benefits of nationality diversity are expected to reinforce each other (Liao et al., 2011).

Conversely, these theoretical considerations await robust empirical support within the expansive literature on the performance impact of diversity within top management and work teams (Nielsen, 2009; Jackson and Joshi, 2010). For instance, Reagans et al. (2004) demonstrate that demographic diversity does not unequivocally correlate with team performance. Similarly, limited empirical research examining the impact of nationality diversity on firm performance yields inconclusive results. While Caligiuri et al. (2004) identify a correlation between nationality diversity in top management teams and internationalization among a sample of 76 U.S.-based multinationals, they do not explore its impact on performance. Chaganti et al. (2008) finds that nationality diversity in founding teams correlates with a more aggressive

growth strategy among 52 Internet start-ups between 1997 and 2000, but not with actual growth. In a study conducted by Laplume et al. (2022) present nationality diversity as a key driver of new venture success in terms of funding raised, supporting the ‘diversity as advantage’ theories. These findings underscore the need for further empirical research in this domain.

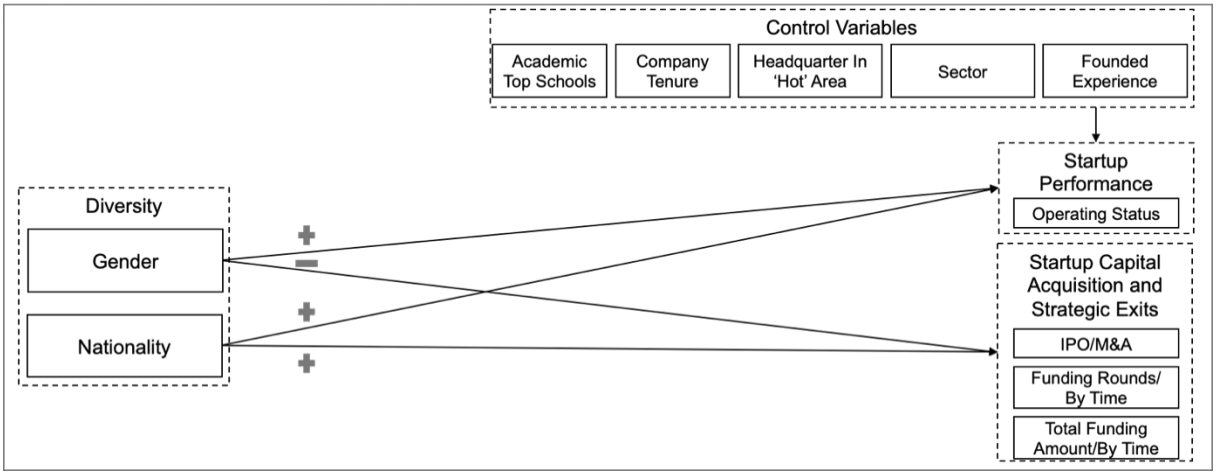
This leads to our third and fourth hypothesis:

Hypothesis 3: The presence of nationality diversity in startup founder team is positively associated with improved performance outcomes.

Hypothesis 4: The presence of nationality diversity in startups founder team is positively associated with the total funding amount received and the number of funding rounds.

This leads to the conceptual model of this article described in Figure 2.

Figure 2: Conceptual Model



3. Data and Methodology

We collected data in Cruchbase on 39,213 companies in the innovation sector and 42,657 founders between 2014 and 2023. Following the approach of Dai et al. (2019), we restricted our sample on companies between one and ten years old, as it takes time for new ventures to establish operations, and firms are generally considered new ventures during the first six years of operation. We also excluded companies with only one founder.

As we restricted to matching information between founders and founded companies, the sample was reduced to approximately 23,271 companies. After removing observations with missing values on the focal variables, we reduced the final sample to 13,355 companies matching 27,277 founders.

3.1. Dependent Variables:

For the purposes of this article, venture performance is understood through two distinct perspectives. Firstly, it involves the ability of founder teams to leverage human capital and resources to sustain company operations, referred to as *operating status* (being active or not), with potential opportunities for *strategic exits such as IPOs or M&As*. Secondly, it pertains to the capacity to attract investment, as measured by the *number of funding rounds* and the *total amount raised.* These metrics may unveil underlying biases in investment opportunities. In the innovation industry, for instance, women-founded companies receive proportionally less investment from venture capitalists than those founded by men (Ewens & Townsend, 2020).

Following are the four dependent variables we used as performance metrics.

- Operational Status: a dummy variable, where 1 indicates that the company is still operational within the ten-year longitudinal dataset, while 0 indicates that the company is no longer in the market.
- Strategic Exits (IPO or M&A): a dummy variable where 1 indicates that the company has achieved a strategic exit through a merger, acquisition, leveraged buyout, or becoming public, while 0 indicates that the company is still privately held.
- *Number of Funding Rounds Over Years:* externalizes the company's capacity to raise funds through venture capital (Lu et al., 2007). To account for the potential bias introduced by differences in company tenure, the number of funding rounds was divided by the age of the company, resulting in an index that could range from 0 to 26.
- *Total Amount Received of Funding Rounds Over Years:* the total investment collected through venture capital in US dollars (Lu et al., 2007). This measurement can vary from $1,000 to $16 billion.

a. Independent Variables:

Gender and nationality diversity were captured by assessing the heterogeneity within founder teams' composition. If at least one member of the founder team differs in terms of gender (male or female) (e.g. Miller et al.,1998; Dai, Byun, & Ding, 2019) or nationality (African, Asian, European, North American, Latino American, or Middle Eastern) (e.g. Chaganti et al., 2008; Reagans et al., 2004), the variable is coded as 1 to indicate heterogeneity, and 0 to indicate homogeneity.

It is important to acknowledge a limitation imposed by this dataset. For this article, ethnicity diversity is considered analogous to nationality diversity, as both relate, to some extent, to shared cultural heritage, traditions, and practices. The same refers to gender diversity, captured when at least one founder declared themself as women.

3.2. Control Variables:

We used control varibles suggested by the academic literature.

- *Year Of Foundation:* the age of the company in terms of the number of years, ranging from 1 to 10 years (2014 to 2023).
- *The Headquarter Geographical Location:* The entrepreneurial ecosystems play a pivotal role in regulating the direction and quality of entrepreneurial innovation. They shape the trajectory and potential rewards of alternative technological developments, as well as the types of organizational forms deemed legitimate (Wright et al., 2015). To categorize geographical location, we used StartupBlink. This classification identified major cities and regions known for fostering innovation, resulting in two main categories: the West Coast, notably the San Francisco Bay Area, Los Angeles, Seattle, and San Diego; and the East Coast, including New York, Boston, and Chicago. If a company's headquarters is located in one of these 'hot' areas, it is classified as 1; otherwise, it is classified as 0.
- *Founding Experience of Founders:* a dummy variable with value 1 if at least one of the founders has previously founder other startups, and zero otherwise. A study by Tzabbar and Margolis (2017) lends further credence to this idea by demonstrating that prior founding experience has a positive and significant effect on the likelihood of a firm creating breakthrough innovations. Specifically, they found that the positive impact

of a founding team's human capital is more pronounced during the growth stage than in the early stages of a startup.

- *Academic Top School Background:* a dummy variable with value one if at least one founder studied in one of the top one hundred leading schools in the world. The classification of this variable is based on the QS World University Rankings, which evaluates academic institutions and their programs, comparing 1,500 universities, 15,700 academic programs, and 104 locations.

Additionally, we controlled for year and sector effects.

4. Results

4.1. Descriptive Analyses

Table 1 provides an overview of the variables used in this study,.

The sample encompasses companies founded between 2014 and 2023, with data spread relatively evenly across most years. However, there is a noticeable decline in the number of companies for the years 2022 and 2023, which may reflect the natural lag in data collection for newer ventures. The stability in numbers across other years indicates a consistent entry of startups into the ecosystem over the past decade, barring recent slowdowns potentially due to economic factors or collection biases.

The Information sector, representing technology and software-oriented companies, constitutes the largest portion of the sample. This is followed by Financial Activities and Education and Health Services, which, along with the Information sector, dominate the modern startup ecosystem. The prevalence of technology firms aligns with current trends in venture capital focus and startup development, emphasizing technology's central role in driving innovation. Financial Activities, including FinTech companies, are also prominent, likely due to the disruptive nature of financial technologies and digital banking solutions in recent years. Conversely, sectors like Construction and Natural Resources and Mining represent a much smaller fraction of the sample, suggesting that startups in these areas may be less common or receive less attention from early-stage investors.

Regarding gender diversity, the sample shows an underrepresentation of women, particularly in sectors such as Financial Activities and Information. This aligns with industry-wide observations that these sectors tend to have fewer women founders, possibly due to historical biases, a lack of female role models, or barriers to entry. By contrast, Education and Health Services and Leisure and Hospitality show a relatively higher representation of women founders. This difference across industries may reflect varying gender norms, career paths, and entry barriers, with some sectors being more inclusive or traditionally attracting a higher proportion of women.

In terms of nationality diversity, the Information and Financial Activities sectors again stand out, with a larger proportion of founding teams comprising individuals from different national backgrounds. This may indicate that these sectors are particularly international, attracting talent from across borders due to the global nature of technology and finance markets. Nationality diversity may also contribute to the adaptability and market reach of startups, potentially making them more attractive to investors seeking innovation and scalability, which aligns with the findings of Gompers and Wang (2017).

It is also important to note the significant impact of heterogeneity in our sample, as this study focused exclusively on companies with two or more founders, with the average number of founders being close to two. This setup highlights the powerful effect of gender diversity; with relatively small teams, the presence of a single woman can introduce significant cognitive and experiential diversity.

Approximately 28% of the companies in the sample have at least one founder who attended a top academic institution, a factor that may influence startup outcomes in several ways. Founders from prestigious schools often bring valuable networks, skills, and credibility, which can attract both talent and investment. This background may also correlate with a more mature approach to business strategy and management, as top institutions often foster leadership and entrepreneurial mindsets.

Additionally, a substantial portion of founders have prior experience in launching companies, suggesting a level of entrepreneurial maturity that may enhance the likelihood of survival and success. This experience can provide founders with practical insights into navigating the challenges of building a new business, as well as a better understanding of investor expectations and market dynamics.

When examining the mean of the Total Funding Amount Received, differences between each diversity variable and potential biases in funding selection become apparent. On average, companies with nationality diversity in their founding teams received 25% more funding than those with homogeneous national backgrounds. This may suggest that investors view nationality diversity as a potential asset, associating it with innovative perspectives, expanded networks, or a broader understanding of global markets. It may also reflect investor confidence in the adaptability and international scalability of these startups.

Conversely, gender diversity shows a contrasting trend, with teams that include female founders receiving 20% less funding on average compared to all-male teams. This finding suggests a potential bias in the allocation of venture capital, which could be due to perceptions about the risk or scalability of female-led startups. Despite growing awareness of the value women bring to leadership roles, these biases may persist, affecting access to resources for female founders. Such disparities in funding can have long-term implications on the growth trajectory of startups with gender-diverse teams, limiting their ability to scale or compete effectively in their respective markets.

Furthermore, the presence of at least one founder from a top-tier educational institution significantly correlates with higher funding, with these companies receiving, on average, 122% more capital. This strong association highlights the importance of academic pedigree in the eyes of investors, as founders from elite institutions may be perceived as more capable or likely to succeed. This advantage could be attributed to the networks, skills, and legitimacy that come with an elite education, which are appealing qualities for venture capitalists looking to reduce risk.

Table 1: Descriptive Analyses

				Different Nationality		*Different Gender*		*Academic Top School*		*Founded Company Experience*	
Variables	**N**	**Mean**	**SD**	Presence	Non Presence	Presence	Non Presence	Presence	Non Presence	Presence	Non Presence
Year	13,355			585	12.770	2,256	11,099	3,855	9,500	5,825	7,530
2014 (D1)	1,232	0.092	0.289	35	1,197	171	1,061	337	895	524	708
2015 (D2)	1,520	0.113	0.317	59	1,461	238	1,282	458	1,062	663	857
2016 (D3)	1,713	0.128	0.334	67	1,646	301	1,412	488	1,225	739	974
2017 (D4)	1,623	0.121	0.326	74	1,549	267	1,356	464	1,159	722	901
2018 (D5)	1,814	0.135	0.342	92	1,722	341	1,473	527	1,287	780	1,034
2019 (D6)	1,682	0.125	0.331	75	1,607	320	1,362	463	1,219	764	918
2020 (D7)	1,721	0.128	0.335	89	1,632	318	1,403	470	1,251	750	971
2021 (D8)	1,257	0.094	0.292	66	1,191	192	1,065	374	883	549	708
2022 (D9)	551			17	534	76	475	191	360	224	327
2023 (D10)	242	0.181	0.133	11	231	32	210	83	159	110	132
Sector	13,094			579	12,515	2,221	10,873	3,794	9,300	5,720	7,374
Construction (D1)	164	0.012	0.111	8	156	17	147	44	120	65	99
Education and Health Services (D2)	2,048	0.156	0.363	91	1,957	524	1,524	665	1,383	865	1,183
Financial Activities (D3)	2,139	0.163	0.369	106	2,033	283	1,856	744	1,395	960	1,179
Information (D4)	4,883	0.372	0.483	254	4,629	668	4,215	1,343	3,540	2,190	2,393
Leisure and Hospitality (D5)	849	0.064	0.246	26	823	153	696	203	646	65	484
Manufacturing (D6)	351	0.268	0.161	9	342	61	290	95	256	143	208
Natural Resources and Mining (D7)	401	0.030	0.172	13	388	61	340	120	281	178	223
Other Services (D8)	37	0.002	0.053		37	17	20	14	23	11	26
Professional and Business Services (D9)	794	0.060	0.238	21	774	112	683	207	588	324	471
Trade, Transportation, and Utilities (D10)	1,427	0.108	0.311	51	1,376	325	1,102	359	1,068	619	808
Headquarter Location	13,355	0.608	0.488	585	12,770	2,256	11,099	3,855	9,500	5,825	7,530
Hot Area	8,126			400	7,726	1,478	6,648	2,805	5,321	3,602	4,524
Non Hot Area	5,229			185	5.044	778	4,451	1,050	4,179	2,223	3,006
Strategic Exits (IPO or M&A)	13,355	0.047	0.212	585	12,770	2,256	11,099	3,855	9,500	5,825	7,530
Presence	633			28	605	75	558	189	444	273	360
Non Presence	12,722			557	12,165	2,181	10,541	3,666	9,056	5,552	7,170
Number of Funding Rounds Over Years (Mean)	13,355	0.487	0.568	0.68	0.47	0.50	0.48	0.59	0.44	0.51	0.46
Total Funding Amount Received (Mean in USD$ - Millions)	8,427	54.3	295	67.26	53.57	45.15	56.18	86.68	38.87	55.11	53.66
Operational Status	13,355	0.952	0.211	585	12,770	2,256	11,099	3,855	9,500	5,825	7,530
Active	12,726			569	12,157	2,157	10,569	3,742	8,984	5,567	7,159
Non Active	629			16	613	99	530	113	516	258	371
Number of Founders (Mean)	27,277	2	1.06	2.84	2.00	2.08	2.03	2.20	2.00	2.16	2.00

4.2. Multivariate Analysis

Table 2 shows the results of the regression analysis for gender diversity and Table 3 for nationality diversity. We run logistic regressions when the dependent variable was operational status or exit strategy, and OLS when the dependent variable was number of funding rounds or total funding.

The results in Table 2 do not support our first hypothesis, which posited that the presence of gender diversity in the founding team is positively related to improved performance outcomes. Gender diversity was irrelevant to explain the operational status of companies (i.e., whether they are active or not), and the presence of women in the founding team decreased the probability of an exit through a strategic sale or and IPO by 33%. The second hypothesis, which posited that the presence of gender diversity in a startup's founding team is negatively associated with the total funding amount received and the number of funding rounds was not supported either. We observe a negatively relation of gender diversity with total funding amount received. Companies with women on their founding teams can expect to secure $1.48 million less compared to companies formed exclusively by men.

Table 3 shows favourable evidence for the third hypothesis, which posited that the presence of nationality diversity in a startup's founding team is positively associated with improved performance outcomes. We found that the presence of different nationalities improves the probability of the company being active by 65%. However, for strategic exits, the results showed no significant relevance.

Finally, the fourth hypothesis, which related to the presence of nationality diversity in a startup's founding team being positively associated with the total funding amount received and the number of funding rounds, is also supported by the results in Table 3. Companies with nationality diversity can expect 0.17 more funding rounds, although this did not translate to a higher total amount of funding received from venture capital.

The results also revealed notable findings for the control variables. The presence of a founder who attended a top school can boost the probability of the company being active by 88%, increase the number of funding rounds by 0.12, and

secure a higher amount of funding by $4.3 million. Additionally, if the company is located in a hot area, it can expect an increase of $2.6 million in funding and a nearly 40% greater probability of achieving a strategic exit.

Table 2: Regression Results for Gender Diversity

Panel A.

	Operational Status *(Odds Ratio)*	***Strategic Exits (IPO or M&A)*** *(Odds Ratio)*	***Number of Funding Rounds Over Years***	***Total Funding Amount Received (USD)***
Diversity Variable				
Gender	1.00 (0.116)	0.67*** (0.085)	-0.004 (0.117)	-1.48e+07* (8,647,737)
Control Variables				
Headquarter Location	0.98 (0.086)	1.39*** (0.125)	0.07*** (0.010)	2.69e+07*** (6,791,180)
Academic Top School	1.88*** (0.209)	1.03 (0.095)	0.12*** (0.120)	4.32e+07*** (6,966,095)
Founded Company Experience	1.10 (0.094)	0.97 (0.081)	0.04*** (0.009)	-2,105,106 (6,440,362)
Year	Yes	Yes	Yes	Yes
Sector	Yes	Yes	Yes	Yes
Observations	*13,355*	*13,355*	*13,355*	*8,427*
Statistic Model	*Logistic Regression*	*Logistic Regression*	*Linear Regression*	*Linear Regression*

Standard erros in parenthesis.
Significance Level: * p<0.1, ** p<0.05, *** p<0.01

Table 3. Regression Results for Nationality Diversity

5. Discussion and Implications

This study aims to explore the implications of gender and nationality diversity within startup founding teams on various performance metrics, including operational status,

	Operational Status *(Odds Ratio)*	***Strategic Exits (IPO or M&A)*** *(Odds Ratio)*	***Number of Funding Rounds Over Years***	***Total Funding Amount Received (USD)***
Diversity Variable				
Nationality	1.65* (0.443)	1.04 (0.210)	0.17*** (0.022)	1.47e+07 (1.41e+07)
Control Variables				
Headquarter Location	0.98 (0.085)	1.38*** (0.123)	0.07*** (0.009)	2.64e+07*** (6,463,578)
Academic Top School	1.88*** (0.205)	1.02 (0.936)	0.12*** (0.010)	4.25e+07*** (6,954,343)
Founded Company Experience	1.08 (0.093)	0.97 (0.081)	0.03*** (0.009)	-2,921,645 (6,463,578)
Year	Yes	Yes	Yes	Yes
Sector	Yes	Yes	Yes	Yes
Observations	*13,355*	*13,355*	*13,355*	*8,427*
Statistic Model	*Logistic Regression*	*Logistic Regression*	*Linear Regression*	*Linear Regression*

Standard erros in parenthesis.
Significance Level: * p<0.1, ** p<0.05, *** p<0.01

strategic exits, total funding received, and the number of funding rounds. Diversity is a complex and multi-faceted construct that embodies both potential benefits and challenges. It can enrich teams with varied perspectives, experiences, and skills but may also introduce conflicts and hinder decision-making due to differing viewpoints. Given the intricate nature of diversity, the startup ecosystem—characterized by rapid growth and innovation—serves as a compelling context for examining its impact, particularly in the face of persistent underrepresentation of women and minority founders.

Using both linear and logistic regression models, this study seeks to provide a nuanced understanding of diversity's role in entrepreneurial success. Our findings reveal a combination of positive and negative associations, highlighting the complexity of diversity's influence on performance. These results offer valuable insights for entrepreneurs, venture capitalists, policymakers, and researchers seeking to optimize team composition and foster inclusive practices within the startup ecosystem.

A. Gender Diversity and Performance Outcomes

Our investigation into the *first hypothesis*, which posited that gender diversity within founding teams positively correlates with improved performance outcomes, yielded mixed results. The relationship between gender diversity and the operational status of companies was found to be non-significant, indicating that gender diversity does not necessarily enhance the likelihood of a startup remaining active. Furthermore, the presence of women in founding teams decreased the probability of strategic exits, such as IPOs or M&As, by 33%, further invalidating the hypothesis.

These findings align with existing literature that highlights the challenges of cognitive heterogeneity within teams. Studies by Miller et al. (1998) and Webber et al. (2001) suggest that diversity can impede long-term planning and decision-making processes due to potential disagreements and difficulties in reaching consensus. However, it is also important to consider the potential benefits of gender diversity that have been documented, such as enhanced innovation and skill complementarity (Jackson, 1992; Miller and Triana, 2009). The mixed results in this study underscore the complexity of the relationship between gender diversity and performance outcomes, suggesting that while diversity can introduce challenges, it also has the potential to drive innovation and strategic advantage under certain conditions. Also, as

a limitation of this study, underscores the necessity for further analyses, especially if they can observe variables such as revenue, size of the company that can bring to discussion a more nuanced understanding.

B. Gender Diversity and Funding

The *second hypothesis* posited a negative association between gender diversity and the total funding amount received and the number of funding rounds. This hypothesis was confirmed, as companies with women on their founding teams received $1.48 million less in funding compared to those founded exclusively by men. This discrepancy may stem from homophily bias within the venture capital (VC) industry, where investors are often drawn to founders who share similar demographic characteristics (Cohen et al., 2018; Ewens & Townsend, 2020). This bias highlights the systemic obstacles that female entrepreneurs continue to face in accessing financial resources. Homophily bias can result in a preference for homogeneous teams, leading venture capitalists to overlook the potential of gender-diverse founding teams. The gender funding gap is a persistent issue, indicating that despite increased awareness of gender diversity's potential benefits, biases remain entrenched within the investment landscape.

C. Nationality Diversity and Performance Outcomes

Nationality diversity delineates the degree to which founding team members originate from diverse cultural backgrounds. For this study, ethnicity diversity is considered analogous to nationality diversity, as both relate to shared cultural heritage, traditions, and practices. Cultural backgrounds impart distinct sets of values and beliefs (Hofstede, 2001), shaping decision-making processes and behaviors (Schwartz, 2012).

The *third hypothesis* examined the impact of nationality diversity on performance outcomes, finding that the presence of different nationalities in founding teams increases the probability of the company being active by 65%. This supports the hypothesis and aligns with research indicating that culturally diverse teams benefit from varied perspectives and decision-making processes (Maznevski, 1994; Watson et al., 1993). The presence of diverse cultural backgrounds can mitigate groupthink, enhance creativity, and foster new product innovation and firm performance (Nathan

& Lee, 2013; Nielsen & Nielsen, 2013). These results also corroborate findings from a meta-analysis by Stahl et al. (2010), which demonstrated that cultural diversity enhances team creativity. However, the study found no significant impact of nationality diversity on the likelihood of strategic exits, suggesting that while diversity may enhance operational resilience, it does not necessarily lead to higher probabilities of achieving major liquidity events.

D. Nationality Diversity and Funding

The *fourth hypothesis* posited that nationality diversity positively correlates with the total funding amount received and the number of funding rounds. Our results supported this hypothesis in terms of the number of funding rounds, with diverse founding teams expecting 0.17 more rounds of funding. However, this did not translate into a higher total amount of funding received from venture capital. These findings suggest that while diverse teams may attract more rounds of funding, possibly indicating investor interest and confidence, the total capital secured does not significantly differ from homogeneous teams.

The mixed results of this study highlight the multifaceted nature of diversity within startup founding teams. While diversity can introduce challenges related to cohesion and decision-making, it also offers significant benefits in terms of innovation, operational resilience, and strategic funding opportunities. The negative impact of gender diversity on funding and strategic exits points to the need for addressing systemic biases within the venture capital industry. Efforts to mitigate these biases could involve promoting greater awareness among investors, fostering inclusive investment practices, and providing targeted support to underrepresented entrepreneurs.

Moreover, the positive impact of nationality diversity on operational status suggests that fostering a multicultural environment within startups can enhance their adaptability and long-term survival. Policymakers and industry leaders should consider strategies to promote national diversity within entrepreneurial ecosystems, such as immigration policies that attract international talent and programs that encourage cross-cultural collaboration.

The findings from this study also support the notion that culturally diverse teams can overcome challenges related to trust-building and communication, thus leveraging the cognitive and resource benefits of nationality diversity. These advantages are particularly pertinent in tasks involving "boundary spanning," where diverse teams can draw upon their varied backgrounds to navigate complex market environments and drive innovation.

In conclusion, this study significantly adds to the expanding literature on diversity in entrepreneurship by offering empirical insights into the intricate relationship between diversity and startup performance. The findings highlight the importance of adopting a nuanced perspective that acknowledges both the potential challenges and advantages associated with diverse founding teams. Addressing biases within the venture capital landscape and promoting inclusivity are critical steps towards leveraging diversity to enhance innovation and foster sustainable growth in startups.

For *academics*, these findings underscore the necessity for further empirical research to unravel the nuanced mechanisms through which gender and nationality diversity influence entrepreneurial outcomes. Such research can inform the development of evidence-based strategies to maximize the benefits of diversity within startup environments. Additionally, future studies should address the limitations of this research by capturing gender and nationality diversity in a more nuanced way. *Venture capitalists* are encouraged to reevaluate investment practices to mitigate biases favoring homogeneous teams. Embracing diversity not only expands the pool of entrepreneurial talent but also enhances investment opportunities by tapping into diverse perspectives and market insights. *Founders* are urged to recognize the strategic advantages of building culturally and gender-diverse teams. By cultivating inclusive environments that celebrate diverse perspectives, founders can enhance decision-making, stimulate innovation, and improve overall team performance. *Governments* play a pivotal role in promoting diversity within the startup ecosystem through supportive policies, funding initiatives, and educational programs. By fostering an inclusive entrepreneurial environment, governments can bolster economic growth, foster job creation, and cultivate a dynamic startup landscape that reflects and serves diverse societal needs.

Advancing diversity in entrepreneurship is not only a matter of equity but also a strategic imperative for unlocking innovation and sustainable success in the global economy. Further empirical research is essential to deepen our understanding of how gender and nationality diversity impact entrepreneurial outcomes and to develop effective strategies for fostering diversity in the startup landscape.

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