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Investigating the Effect of Diversity on Innovation Performance: An Empirical Research on the Relationship between Career, Education, and Age Diversity of Start-Up Founders and Business Growth

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Abstract

Diversity among members in innovation activities is widely recognized as an important initiative. However, previous studies on innovation and diversity present conflicting findings regarding the impact of diversity on innovation performance. To examine the effect of diversity on innovation performance, we focused on the diversity of start-up founders and innovation outcomes. A questionnaire survey was conducted with start-ups in Japan. Questionnaires were distributed to 483 start-ups in 2023, and 136 valid responses were obtained. The analysis was conducted using data from 126 firms, after excluding cases with missing values for relevant variables. This analysis yielded three key findings. First, a larger number of start-up founding members have a positive impact on business growth. The results indicate that start-ups with multiple founders tend to advance to higher funding rounds than those founded by a single individual. Second, higher education diversity among start-up founding members positively influences the progress of funding rounds. The central figure within the spectrum of diverse educational backgrounds is the holder of a master's degree and the presence of such individuals significantly alters the growth trajectory of start-ups. Third, higher job career diversity positively affects the progress of funding rounds. The professional background of the founders before starting the business greatly impacts the social capital brought into the start-up.

Keywords

Innovation Performance, Start-Up, Founder, Diversity

1. Introduction

The importance of diversity management in innovation activity has long been recognized. For example, collaboration among individuals with diverse knowledge, experiences, and values can serve as a catalyst for knowledge combination and new knowledge creation. Moreover, respecting different perspectives and opinions fosters psychological safety, which becomes a source of originality and creativity (Edmondson, 2012). In innovation settings where people with varying perspectives and attitudes collaborate, diversity management is important for overcoming the potential risks of friction and conflict. In this sense, diversity management in innovation activity carries strategic organizational implications that not only help diversify human resources, but also generate effective value creation in environments where diverse talents collaborate.

In academic research, studies on innovation and diversity have evolved in a closely interconnected way. Innovation research includes numerous empirical studies on the positive and negative mediating impacts of member diversity on individual creativity and innovation generation (e.g., Ardito et al., 2018; Smith et al., 1995; Chesbrough et al., 2006; Becker & Dietz, 2004). Conversely, in diversity research, individual creativity and idea generation have been positioned as the most crucial performance indicators that demonstrate the effects of diversity; further, these are deemed essential for organizational innovation and competitiveness (Shin et al., 2012; Wang et al., 2013; Williams & O'Reilly, 1998).

Despite the abundance of prior research, the effects of diversity on innovation performance present a complex picture. For instance, a large-scale meta-analysis by Van Dijk et al. (2012) that covered 146 previous studies revealed that the relationship between diversity and performance varied according to the measurement criteria. They found that among the subjective indicators, gender and age diversity showed negative correlations, while career and educational diversity demonstrated positive correlations. However, for the objective indicators, no significant correlations were found, regardless of the attribute type. Similar conclusions were drawn in a review by Joshi and Roh (2009), who found that more than half the empirical studies showed no significant correlation between diversity and team performance.

One reason for these inconclusive results is the complexity of innovation activity. Most prior research has focused on innovation activity within firms by tracking the relationship between member diversity and activity outcomes. The issue here is that the outcomes of these innovation activities are not solely determined by the performance of the members involved. They can be significantly influenced by other departments' activities, such as public relations, or the decisions made at the management level. Additionally, the constant flux of personnel makes it difficult to identify the core members of innovation activities. Unless these challenges are addressed, it is difficult to accurately understand the relationship between the diversity of members engaged in innovation activities and their performance.

Therefore, this study examines the relationship between diversity effects and

innovation performance by focusing on the diversity of start-up founders and their innovation outcomes. Using data on 126 domestic start-ups from our original survey, we investigate the relationship between age diversity among founding members and innovation performance. The survey captured information on the age, work history, and educational background of up to four founding members of each start-up.

2. Literature Review and Hypotheses Development

Innovation activities depend on individuals' abilities to exercise creativity and generate novel and useful ideas. However, novel ideas and creative actions are not necessarily the sole product of independent individual thought. Rather, valuable ideas that lead to actual innovations tend to be more practically reinforced through opportunities for contact with others' knowledge and experiences, and the clash of opinions (Ng & Feldman, 2012; Salthouse, 2012). In this sense, individual ideas and knowledge that serve as sources of innovation are highly dependent on the circulation and combination of diverse knowledge.

Consequently, in innovation research, the formation of collaborative groups or networks among a diverse set of members, is considered to have a positive effect on members' creativity. The fundamental argument is that the different knowledge and experiences possessed by each member complement and stimulate the knowledge and creativity of others, ultimately invigorating the innovation activity of the entire group or network (Van Knippenberg et al., 2013). Indeed, previous studies have reported numerous cases in which innovation emerges from collaboration, and the determinants of effective collaboration further lead to innovation, and performance outcomes (e.g., Ardito et al., 2018; Smith et al., 1995; Chesbrough et al., 2006; Becker & Dietz, 2004).

However, previous studies do not necessarily converge on a unified perspective on these positive effects (Lin, 2014; Sandberg et al., 2015). Rather, as suggested by the well-known phrase "the double-edged sword of diversity" (Milliken & Martins, 1996: p. 403), collaboration among diverse members can generate conflicts and alienation, potentially negatively impacting individual creativity and group collaboration (e.g., Ahuja, 2000; Dacin et al., 1997; Khedhaouria & Jamal, 2015). For instance, Khedhaouria and Jamal (2015) point out that when diversity within a team is excessively emphasized, leading to an extreme dispersion of member attributes, creative work can be hindered within the team. Specifically, differences in values arising from educational and professional backgrounds and the formation of subgroups due to generational communication gaps are highlighted as potential issues.

Two opposing viewpoints are present in the existing research on diversity in innovation activity. On the one hand, diversity is positively interpreted as facilitating knowledge complementation and stimulating creativity; on the other hand, it is negatively viewed as a source of friction and division. These conflicting arguments are yet to reach consensus (Lin, 2014; Sandberg et al., 2015).

One reason for these complex outcomes is the inherent complexity of innovation activity. Many previous studies have focused on the relationship between the diversity of the team members involved in corporate R&D activities or new business development and the resulting performance outcomes (Hoisl et al., 2017; Seong et al., 2015; Mohammed & Nadkarni, 2011; Faems & Subramanian, 2013). To achieve successful performance, these activities require not only the involvement of R&D and new product development teams, but also significant contributions from various other human resources. Furthermore, these efforts are often heavily influenced by the decisions and intentions of the top management. In large firms, for instance, new business development initiatives are frequently halted due to concerns about cannibalization. Additionally, in existing firms, tracking information becomes even more difficult when members hold concurrent roles in other departments or undergo role changes due to promotions. The relationship between member diversity and innovation performance cannot be fully understood without addressing these challenges.

In light of these concerns, this study generates the following hypotheses regarding the relationship between diversity and innovation performance. We examine these hypotheses by analyzing the relationship between the diversity of the founding members and innovation outcomes in start-ups.

- H1: A start-up with a larger number of founding members has a positive impact on business growth.
- H2: Age diversity among start-up founding members positively affects business growth.
- H3: Educational diversity among start-up founding members positively affects business growth.
- H4: Professional background diversity among start-up founding members positively affects business growth.

The advantages of focusing on start-ups are as follows. First, start-ups are among the most critical players driving innovation in today's economic and social landscape. Second, unlike the R&D or new business development efforts of existing firms, which have been the focus of much previous research, start-ups typically work toward a single mission. Owing to their small-scale, single-business nature, the growth process of a firm can be captured more directly, allowing for a clearer measurement of the relationship between member diversity and innovation outcomes. Third, in the case of start-ups, the members involved in innovation activities are usually founding members, enabling a more accurate assessment of their diversity.

3. Research Method

3.1. Data

A custom-designed survey was conducted with start-ups in Japan, and the obtained data were statistically analyzed. The survey was conducted in cooperation with the Innovation Division of the Japan External Trade Organization (JETRO).

The primary survey subjects were domestic start-ups that had participated in startup-related events organized by JETRO, or had received support for overseas expansion. The focus was mainly on firms with relatively large market capitalizations. The contact information collected from private databases was also used to include additional participants in the survey.

Questionnaires were distributed to 244 firms from January to March 2023 and an additional distribution targeting 239 firms was conducted in November to increase the number of responses. The Innovation Division of JETRO distributed electronic survey files to the target firms via email and also requested for responses through face-to-face contact and phone calls.

The survey request stated that the collected data would be anonymized and managed to ensure that individual or firm identities would not be disclosed. No incentives were provided for participation. Ultimately, 136 valid responses were obtained, yielding a response rate of 24.9%. Information for any clearly identifiable missing items was supplemented from the firms' websites and other sources. The analysis was conducted using data from 126 firms, after excluding cases with missing values for relevant variables.

The questionnaire was designed based on basic items concerning firm profiles, such as sales revenue, capital, and the supply forms of main products or services, following the Ministry of Economy, Trade and Industry's "University-Startup Venture Survey" (METI, 2024). For the founding members, information on age, sex, highest educational attainment, and previous job experience was requested for up to four individuals.

3.2. Dataset Description

The average firm age of the 126 firms in the dataset was 8.3 years, and the average number of current full-time employees was 98.4. Analysis of the primary product/service areas revealed that 31.7% of the firms focused on B2B (Business to Business) products, followed by information technology at 22.2%, and healthcare/medical services at 21.4%; with the top three sectors accounting for three-quarters of the total. B2C (Business to Consumer) products represented 7.9% of the total. The Japan Patent Office conducted a large-scale survey of domestic start-ups. According to this survey (as of January 2022), among the 7946 unlisted start-ups established between 2006 and 2020, information and communication was the largest sector, accounting for 43.4%, followed by business services at 19.0%, consumer services at 15.4%, and biotechnology/pharmaceuticals at 11.9%. In comparison, the dataset used in this study showed a lower proportion of information technology and B2C products and a higher proportion of B2B and healthcare/medical services.

In the dataset of 126 firms, the distribution of funding rounds was as follows: Series C and beyond (unpublished) accounted for 27.8%, Series A for 23.8%, and Series B for 21.4%. Seed rounds, including only equity and angel investments, constituted 13.5%, while Initial Public Offerings (IPOs) and Mergers and Acquisitions

(M&A s) accounted for 11.1% and 2.4%, respectively. Although the Japan Patent Office (JPO, 2022) reports on listed start-ups separately, seed rounds had the highest proportion at 45.8%, followed by Series A at 27.5%, Series B at 16.4%, and Series C at 7.3%, among the 3217 unlisted start-ups surveyed. The dataset used in this study tends to have a higher proportion of firms that progressed further in their funding rounds.

Additionally, many of the surveyed firms were already connected with JETRO's activities, suggesting that they may be more proactive or interested in international expansion. When interpreting these results, it is essential to carefully consider this characteristic of the dataset.

3.3. Variables

The dependent variable was "funding round," which served as a proxy for business growth. Specifically, the stages were categorized as ordered variables: "self-funded only," "angel (less than 10 million yen)," "seed (10 million to several tens of million yen)," "Series A (several tens of million to hundreds of million yen)," "Series B (approximately several billion yen)," "Series C and beyond (over several billion yen)," and "post-IPO or M&A".

The explanatory variables included "number of founders," "age diversity," "education diversity," and "job career diversity." Number of founders" was coded as follows: 1 = single founder; 2 = two founders; 3 = three founders; and 4 = four or more founders. "Age diversity" was measured by counting the number of age groups represented among the start-up founders, categorized as 20s, 30s, 40s, and 50s. Thus, the minimum value was one and the maximum value was four. "Educational diversity" was assessed by categorizing the educational backgrounds of the founders into "technical college," "bachelor's degree," "master's degree," and "doctoral degree." Since no start-up included all four educational categories, the maximum value was three. "Job career diversity" was measured by the number of different career backgrounds of the founders, focusing on "freelance," "existing firm," "start-up," and "academia." Owing to the inclusion of founders who were still in school or without any of the above backgrounds, the variables ranged from zero to four. However, none of the start-ups in the dataset had a value of four.

Additionally, a control variable "firm age" was included. Dummy variables were created for the main product/service areas, specifically a "health dummy" and "IT dummy." The reference category was fields other than "health dummy" and "IT dummy." Control variables were created in the form of primary product/service provision. The survey included four options: B2B (46.7%), B2C (21.4%), intermediate (11.9%), and service consultation (19.0%). A value of 1 was assigned to B2B, and 0 to the other options, generating the variable "B2B dummy."

These variables are summarized in **Table 1**, which displays the minimum, maximum, mean, and standard deviation values of each variable. Statistical analysis was performed using IBM SPSS version 23.

Table 1. Statistics.

	min	max	mean	S.D.
funding round	1	8	4.97	1.48
number of founders	1	4	2.16	1.01
age diversity	1	4	1.41	0.57
education diversity	1	3	1.49	0.60
job career diversity	0	3	1.63	0.74
firm age	0	28	8.65	5.10
heath D.	0	1	0.21	0.41
IT D.	0	1	0.21	0.41
B to B D.	0	1	0.48	0.50
20s D.	0	1	0.71	0.39
30s D.	0	1	0.54	0.50
40s D.	0	1	0.33	0.47
50s. D.	0	1	0.19	0.40
technical college D.	0	1	0.51	0.50
bachelor degree D.	0	1	0.40	0.42
master degree D.	0	1	0.45	0.50
doctor degree D.	0	1	0.44	0.50
freelance D.	0	1	0.38	0.51
existing firm D.	0	1	0.78	0.42
start-up D.	0	1	0.15	0.36
academia D.	0	1	0.29	0.46

4. Results

To test H1, a multiple regression analysis was applied. Equation (1) illustrates the estimation model for H1: "Funding" denotes funding round, "No. Founders" indicates the number of founders, X represents the control variables, and ε stands for the error term.

$$Funding_i = \alpha + \beta \times No.Founders_i + \sum_{k=1} \gamma_k X_i + \varepsilon_i \quad (1)$$

Table 2 presents the results of the verification of H1. A statistically significant relationship at a level of less than 0.1% was found between the "number of founders" and "funding round;" thus supporting H1, which posited that "the larger the number of start-up founding members, the more positive the effect on business growth." Among the control variables, "firm age" also showed statistical significance. As expected, older start-ups tended to make more progress in fundraising.

The same multiple regression analysis was applied for testing H2, H3, and H4. Like Equation (1), Equation (2) uses "Funding" to represent the funding round,

and "Diversity" to denote each of the three main explanatory variables representing diversity.

$$Funding_i = \alpha + \beta \times Diversity_i + \sum_{k=1} \gamma_k X_i + \varepsilon_i \quad (2)$$

Before proceeding with the verification of H2, H3, and H4, we examined the relationship between the dummy variables for each diversity component and the funding round (Table 3). For age, a dummy variable was created using members in their 20s as the reference group. The results indicate that having founding members who are in their 30s significantly affects the funding round variable. For education, a dummy variable was created using technical college as the reference group. The results show that start-ups that include members with master's or doctoral degrees exhibit significantly-positive business growth. Particularly, the presence of members with master's degrees led to notable changes. Regarding career background, the dummy variables reveal that having members who were employed either at an existing firm or another start-up before founding their own firm, positively affects business growth. Among these, members who previously worked at existing firms exhibited the most substantial influence, based on the coefficient values.

The results of the verification of H2, H3, and H4 are presented in Table 4. As shown in Models 6, 7, and 8, both "age diversity" and "education diversity" are significant at the 5% level, while "job career diversity" is significant at the 0.1% level, indicating statistically valid results. In Model 9, where all variables including "number of founders" are incorporated, the significance of "age diversity" becomes slightly weaker, while "education diversity" and "job career diversity" remain statistically significant.

In the final stage of the hypothesis-testing process, to examine the effects of diversity more accurately, the interaction term of the number of founders and diversity was created, followed by multiple regression analysis. Equation (3) presents the estimation model with the newly added interaction term representing the cross-effects between Diversity and No. Founders.

$$\begin{aligned} Fundrai\sin g_i = {} & \alpha + \beta_1 \times DiversityA_i + \beta_2 \times No.Founders_i \\ & + \beta_3 \times DiversityA_i \times No.Founders_i + \sum_{k=1} \gamma_k X_i + \varepsilon_i \end{aligned} \quad (3)$$

The results are shown in Table 5 and Table 6. In Table 5, "education diversity × No. Founders," and in Table 6, "job career diversity × No. Founders" show statistically significant relationships. However, no statistical significance was found for "age diversity × No. Founders." These findings indicate that as the number of start-up founders increases, greater diversity in educational and professional backgrounds positively influences business growth.

These results support H3 and H4 which state, "The educational diversity of start-up founding members has a positive effect on business growth," and "The job career diversity of start-up founding members has a positive effect on business growth," respectively. However, H2, "The age diversity of start-up founding members has a positive effect on business growth," was not fully supported.

Table 2. Relationship between number of founders and funding round.

	Model 1
number of founders	0.434***
firm age	0.146***
heath D.	0.365
IT D.	0.572
B to B D.	−0.028
R^2	0.233
adjusted R^2	0.189
sample	126

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

Table 3. Relationship between each diversity component and funding round.

	Model 2	Model 2	Model 4
30s D	0.424**		
40s D	0.228		
50s D	−0.158		
bachelor degree D.		0.232	
master degree D.		0.694***	
doctor degree D.		0.456*	
existing firm D.			0.557***
start-up D.			0.189*
academia D.			0.099
firm age	0.140***	0.142***	0.143***
heath D.	0.453***	0.447***	0.370***
IT D.	0.509	0.671	0.585
B to B D.	−0.183	−0.086	−0.035
R^2	0.236	0.233	0.244
adjusted R^2	0.202	0.209	0.211
sample		126	

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

Table 4. Relationship between each diversity aspect and funding round.

	Model 5	Model 6	Model 7	Model 8	Model 9
number of founders	0.434***				0.406**
age diversity		0.322*			−0.069
education diversity			0.399*		0.146*
job career diversity				0.462***	0.299**

Continued

firm age	0.146***	0.136***	0.139***	0.144***	0.146***
heath D.	0.365	0.382	0.436	0.318	0.354
IT D.	0.572*	0.546*	0.679*	0.614*	0.640*
B to B D.	−0.028	−0.077	−0.028	0.001	0.031
R^2	0.219	0.228	0.239	0.224	0.304
adjusted R^2	0.201	0.196	0.207	0.199	0.257
sample			126		

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

Table 5. Validation results including the interaction term of education diversity and number of founders.

	Model 10	Model 11	Model 12	Model 13
number of founders	0.434***			0.100*
education diversity		0.199*		−0.123
education diversity × No. founders			0.138**	0.227**
firm age	0.146***	0.139***	0.144***	0.142***
heath D.	0.365	0.436	0.423	0.396
IT D.	0.572	0.679*	0.705*	0.658*
B to B D.	−0.028	−0.028	0.001	0.016
R^2	0.239	0.239	0.231	0.278
adjusted R^2	0.208	0.207	0.208	0.242
sample		126		

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

Table 6. Validation results including the interaction term of job career diversity and number of founders.

	Model 14	Model 15	Model 16	Model 17
number of founders	0.434***			0.099*
job career diversity		0.462***		−0.034
career diversity × No. founders			0.125**	0.132**
firm age	0.146***	0.144***	0.146***	0.146***
heath D.	0.365	0.318	0.334	0.337
IT D.	0.572	0.614*	0.616*	0.614*
B to B D.	−0.028	0.001	0.013	0.012
R^2	0.226	0.222	0.221	0.282
adjusted R^2	0.204	0.200	0.200	0.247
sample		126		

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

5. Discussion

Table 5 and Table 6 show that higher levels of educational diversity and job career diversity among start-up founding members positively influence the progress of funding rounds after establishment. Furthermore, Table 3 indicates that those with master's degrees, and individuals from existing firms are central to driving educational and professional diversity.

Considering Japanese society, it is understandable that holders of master's degrees form the core of educational diversity. In Japan, universities with higher academic rankings are predominantly national universities, many of which have large engineering and life sciences departments. Generally, most students enrolled in these institutions proceed to master's programs before entering the workforce. Additionally, many social science graduates obtain an MBA as they advance in their careers. This has led to the significant presence of master's degree holders at the core of Japan's economy. Although the number of doctoral degree holders is gradually increasing, the Japanese government views this aspect as lagging behind other countries. This context likely explains the differences in the influence of master's and doctoral degree holders on the findings.

Existing firm members form the core of career diversity. Initially, we anticipated that start-up founders with prior experience in other start-ups would have higher success rates. There are numerous reports in the literature on serial entrepreneurs' successes (e.g., Dahl & Sorenson, 2012; Mack & Mayer, 2016; Auerswald & Dani, 2017; Mason & Harrison, 2006). However, the finding that the inclusion of members from existing firms in the founding team positively correlates with the progression of funding rounds likely reflects the current characteristics of the Japanese economy. While independent venture capital firms have been increasing, many venture capitalists in Japan still operate under the umbrella of financial institutions, such as securities and insurance firms. Having at least one member in the founding team who understands the operational principles of existing firms, rather than having members solely from universities or other start-ups, likely facilitates smoother communication with investors and instills confidence in their investment decisions. Whether a venture actually succeeds after securing funding is another matter, but domestic investors appear to value the presence of existing firm members on start-up teams.

Although the effect of age diversity is not statistically confirmed, Table 3 suggests that the presence of founders in their 30s has a significant impact on the progression of funding rounds. Conversely, although founders in their 50s do not show statistically significant results, a negative coefficient is observed. However, when the effect of age diversity was tested by focusing solely on start-ups with founders in their 30s, the dynamics altered slightly. Figure 1 illustrates how the inclusion of other age groups influenced the progression of funding rounds for start-ups with 30-year-old members. The results indicate that start-ups tend to score higher when members in their 40s or 50s are included, rather than solely relying on a team of 30-year-olds. This aligns with prior research highlighting the

importance of older members, often referred to as grey entrepreneurs (e.g., Singh & DeNoble, 2003; Weber & Schaper, 2004). This suggests that these individuals play a crucial role in start-up growth in Japan.

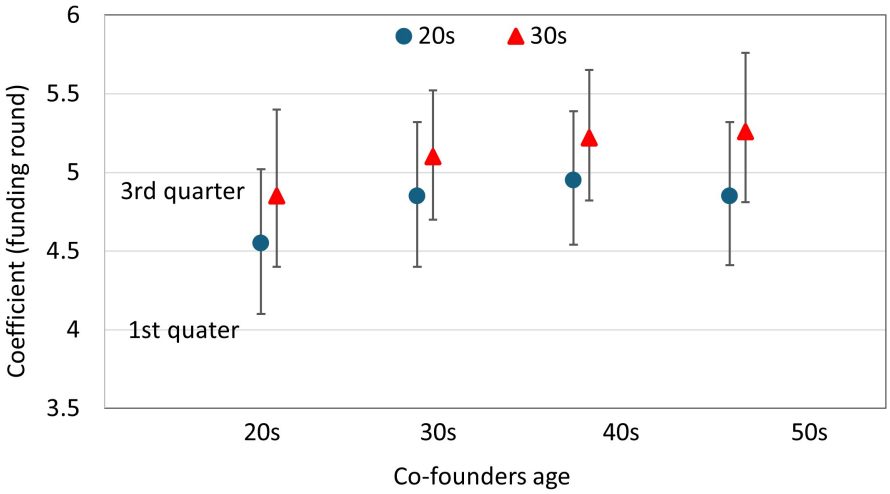

Figure 1. Funding round coefficient of start-ups including co-founders in their 20s and 30s.

6. Findings and limitations

Individual creativity and idea generation are considered critical parameters in organizational innovation activities, and ensuring diversity among members is widely recognized as an important initiative to enhance these parameters. However, empirical studies on innovation and diversity present conflicting findings regarding the impact of diversity on individual creativity and innovation performance among those engaged in innovation activities. Some studies have reported positive effects, whereas others have reported negative effects. Furthermore, in a large-scale meta-analysis, Van Dijk et al. (2012) examined 146 previous studies and revealed that when the relationship between diversity and performance was measured using objective indicators, such as financial success, no significant correlation was found, regardless of members' attributes.

One reason for these conflicting results may be the complexity of the innovation activities being studied. Many studies have focused on the relationship between diversity among members and the outcomes of innovation activity within firms. The issue here is that the success of such innovation activity is not solely determined by the performance of the members involved; it is also significantly influenced by the actions of other departments such as public relations, and management decision-making. To examine the relationship between diversity and innovation performance, we focused on the diversity of start-up founders and innovation outcomes. By narrowing the analysis to start-up founding members, we were able to capture the growth process of firms more directly, in contrast to most previous studies that examined R&D or new business development in established firms. This allowed a clearer measurement of the relationship between diversity

among members and the outcomes of innovation activity. Additionally, because the members engaged in innovation activities were themselves founding members, their diversity could be accurately assessed as open and accessible information.

This analysis yielded three key findings. First, a larger number of founding start-up members have a positive impact on business growth. In this context, business growth is represented by the progress of funding rounds as a proxy variable. The results indicate that start-ups with multiple founders tend to advance quickly to higher funding rounds than those founded by a single individual.

Second, higher education diversity among start-up founding members positively influences the progress of funding rounds as the number of founding members increases. The central figure within the spectrum of diverse educational backgrounds is the holder of a master's degree and the presence of such individuals significantly alters the growth trajectory of start-ups. In Japanese society, particularly in the natural sciences, obtaining a master's degree has become the dominant path for highly educated professionals, and this background appears to reflect in the results. The presence of master's degree holders complemented by those with bachelor's or doctoral degrees contributes to increasing the founding team's overall capabilities.

Third, it was found that higher job career diversity positively affects the progress of funding rounds after a start-up's founding. The professional background of the founders before starting the business greatly impacts the social capital brought into the start-up. The results of this study reaffirm the importance of diversity in social connections for start-up growth. However, it is noteworthy that the key component of job career diversity is founders' experience in existing firms. Previous studies have highlighted serial entrepreneurs' significant contributions to the formation and development of entrepreneurial ecosystems (e.g., Spigel, 2017; Spigel & Harrison, 2018; Stam, 2015; Stam & van de Ven, 2021). We initially hypothesized that members with prior start-up experience would contribute the most. However, the estimation results show that when members with backgrounds in existing firms are included in the founding team, the funding rounds progress further. This finding may reflect the current characteristics of the Japanese economy, where financial venture capitalists are predominant, and corporate venture capital from large firms is widely deployed. Compared with founding members with backgrounds solely in academia or other start-ups, those who understand the operational principles of existing firms may facilitate easier communication and provide a sense of security to investors, making it easier for them to commit to funding.

Finally, this study has some limitations. First, the data used in this research were collected in cooperation with the JETRO Innovation Division. Because many of the surveyed firms had ties to JETRO's activities, they were likely to be more proactive or highly interested in international expansion. Additionally, compared to larger surveys targeting domestic start-ups, the dataset used in this study included

fewer firms from the information technology and B2C sectors and a higher proportion of B2B and healthcare/medical firms. Furthermore, the dataset contained a relatively high percentage of firms that advanced through later funding rounds. Given the characteristics of the analyzed dataset, careful consideration is required when interpreting the results. It should be noted that in the Japanese market, many start-ups are still in the seed or early stages. Since the dataset in this study represents a "select few" successful firms, further verification is necessary to determine whether the findings can be generalized widely.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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