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INVESTMENT DECISION FACTORS OF BUSINESS ANGELS IN JAPANESE REGIONAL STARTUPS: THE INFLUENCE OF GROWTH STRATEGIES AND SOCIAL CAPITAL ON INVESTMENT BEHAVIOR

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Abstract

This study aims to address the funding disparities faced by regional startups in Japan by conducting a multifaceted analysis of business angel investment behavior. The focus is on examining how growth strategies and social capital influence BA investment decisions, while highlighting the differences in the fundraising environment between Tokyo and regional areas.
Initially, a topic model analysis was conducted on company data collected from press releases and startup databases, revealing distinct investment themes by region. In Tokyo, investments are predominantly directed towards AI and platform-based ventures, whereas regional areas demonstrate a strong focus on sectors like agriculture and healthcare. Furthermore, a sequential pattern analysis was employed to examine the impact of different investor combinations on fundraising outcomes, uncovering unique investment patterns in regional areas that support local growth. This research offers new insights into how region-specific investment behaviors and networks can contribute to bridging the equity gap. The findings provide practical implications for fostering regional economic revitalization by leveraging localized investment strategies and social capital.

Key words: Business Angels, Regional Startups, Growth Strategies, Social Capital, Regional Equity Gap

1. Introduction

Regional startups in Japan face significant disadvantages in securing funding compared to their urban counterparts. The British Macmillan Report of 1931 highlighted disparities in long-term financing based on company size, a phenomenon that came to be known as the "Macmillan Gap."

Building on this concept, Mason and Harrison (1994) identified a "regional equity gap," noting that venture capital (VC) investments are predominantly concentrated in urban areas, leaving regional small and medium-sized enterprises (SMEs) at a disadvantage in accessing funds. Similarly, Funaoka and Kutsuna (2006) reported that VC investments in Japan remain heavily concentrated in Tokyo, posing ongoing challenges for regional startups in obtaining financing. This lack of funding for regional enterprises restricts business expansion and technological innovation, ultimately contributing to the stagnation of regional economies.

Previous research has extensively discussed the challenges faced by regional startups in securing funding, yet studies specifically examining the investment practices of business angels (BAs) remain limited. As noted by Harrison *et al.* (2010) and Drover *et al.* (2017), our understanding of the geographical characteristics and decision-making processes of BAs is still underdeveloped. Unlike venture capitalists (VCs), BAs exhibit flexible and individualized investment behaviors, particularly when it comes to their motivations and decision criteria for investing in regional startups. However, empirical analyses exploring these aspects are lacking, especially regarding the impact of BA investments on regional economies. This study aims to fill these research gaps by comparing BA investments in Tokyo and regional areas to elucidate how regional characteristics influence BA investment behavior.

This study utilizes data obtained from press releases and startup databases, covering quarterly data from Q3 2023 to Q3 2024. The analysis employs a combination of quantitative techniques, specifically text mining and topic modeling, to explore differences in investment trends between Tokyo and regional areas. Additionally, an examination of fundraising amounts and investor combination patterns is conducted to highlight the distinctive features of BA investment behavior in each region. Data processing was performed using Python, with topic modeling based on Non-negative Matrix Factorization (NMF) to identify underlying themes and trends.

This study offers new insights into the role that BAs play in supporting regional startups. By examining the impact of growth strategies and social capital on BA investment decisions, it provides novel perspectives on the regional equity gap—an area that has remained largely unexplored in previous research. The findings from this study are expected to offer valuable implications for policymakers aiming to revitalize regional economies, as well as for regional firms developing effective fundraising strategies.

This paper is structured as follows: Chapter II reviews prior studies on BA investment behavior, organized by generational perspectives, to establish the theoretical background. Chapter III provides a detailed explanation of the datasets and analytical methods employed in this study. Chapter IV presents a quarterly comparison of investment trends targeting startups in Tokyo and regional areas, exploring the impact of regional characteristics on BA investment decisions through analyses of investor combination patterns and topic modeling. Finally, Chapter V concludes the study and discusses potential directions for future research.

2. Literature review
2.1. Extraction of previous research

The objective of this chapter is to elucidate how BAs can function within the framework of venture finance to address the regional equity gap. By categorizing previous research findings by generation and clarifying the approaches, research questions, and limitations of each, this chapter establishes the theoretical foundation for the present study.

This research employs a semi-systematic literature review approach, emphasizing the integration of diverse perspectives and new insights from related fields. This methodology not only deepens the accumulated knowledge within a specific research domain but also fosters new understandings from a cross-disciplinary perspective. To examine how each generation's research findings have influenced subsequent studies and what implications current knowledge holds for future research development, this study adopts the generational classification proposed by Harrison and Mason (1999). Literature is divided into three periods: the first generation (1970s

to early 1990s), the second generation (late 1990s to early 2000s), and the third generation (2010s to the present). This classification allows for an exploration of how research from each generation has shaped subsequent studies and provides insights for future research directions.

2.2. First generation research: 1970s to early 1990s

The first generation of research focused on the role of BAs in addressing the regional equity gap. During this period, studies identified information asymmetry and limited access to capital as significant barriers to fundraising for regional startups. Specifically, theoretical explorations were conducted on how BAs could overcome these obstacles and support the growth of regional startups. The importance of BAs investing in regional companies beyond geographical constraints was emphasized, with a focus on stimulating regional economic revitalization.

The importance of "weak ties" in facilitating information flow across different social groups, suggesting their potential in mitigating information asymmetry. Similarly, Myers and Majluf (1984) argued that when companies possess more information than investors, securing external funding becomes challenging, thereby hindering corporate growth and investment incentives. These studies collectively indicated that regional startups struggle with fundraising due to information asymmetry, which exacerbates the regional equity gap.

On the other hand, Mason and Harrison (1986) pointed out that Business Angel Networks (BANs) play a crucial role in supporting the fundraising efforts of regional startups. Specifically, BANs, especially those supported by the public sector, were found to contribute to regional economic revitalization through small-scale funding for local startups (Mason and Harrison, 1992). Furthermore, BAs could enhance the efficiency of funding regional startups through syndicated investments as a means of risk diversification. This approach allows for investment activities that transcend geographical limitations, promoting the flow of capital into regional startups.

Overall, first-generation research made a significant academic contribution by highlighting the role of BAs in mitigating information asymmetry and underscoring the importance of BANs. However, these studies largely remained theoretical, with a noted lack of empirical data (Mason and Harrison, 1997). In particular, concrete methods for how regional startups can overcome information asymmetry and successfully secure funding were not sufficiently addressed. Thus, future research requires a more empirical approach to clarify how BA support can help regional companies overcome fundraising barriers and achieve growth.

2.3. Second generation research: late 1990s to early 2000s

The second generation of research focused on revitalizing BA activities to improve the fundraising environment in regional areas. This period emphasized the importance of strengthening collaboration between BAs and VCs as a critical factor in fostering the growth of regional startups. Tashiro (1999) highlighted that Japanese BAs were not actively utilizing formal networks or online platforms, which contributed to the delayed development of BANs in Japan. Furthermore, comparative studies by Hindle and Lee (2002) revealed that Japanese BAs primarily rely on personal networks for information gathering, a situation that contrasts sharply with countries like Singapore and Australia. As a result, information asymmetry remains a significant challenge in Japan, limiting the scope of BA investment activities.

Regarding the relationship between BAs and VCs, Harrison and Mason (2000) pointed out that these two groups play complementary roles at various stages of investment. Specifically, BAs often support startup growth during the initial stages through follow-on investments, establishing a division of labor that enhances the startup ecosystem. As Osnabrugge (2000) indicated, such co-investment strategies also contribute to risk diversification. For regional startups, cooperation between BAs and VCs is expected to stabilize funding flows.

One of the key contributions of second-generation research was clarifying the role of BANs in supporting the growth of regional startups. However, it was also shown that the effectiveness of BANs varies depending on regional characteristics, indicating that merely

promoting BA and VC activities is insufficient (Mason and Harrison, 2002). Flexible policy frameworks tailored to the economic structure and maturity level of local firms are essential to create an environment conducive to the sustainable growth of regional startups. From this perspective, second-generation research emphasized the need for diversified investment strategies and region-specific policies to stimulate regional economic revitalization.

2.4. Third generation research: 2010s and beyond

Since the 2010s, third-generation research has increasingly emphasized the critical role that BAs play in supporting regional startups as part of efforts to bridge the regional equity gap. These studies particularly focus on how BAs leverage informal networks and syndications to actively invest in regional startups. It has been demonstrated that, by engaging in co-investments with other investors rather than operating independently, BAs can diversify risk while also considering the impact of geographical distance on their investment decisions.

Harrison *et al.* (2010) highlighted the role of BAs in utilizing informal networks to access information on investment opportunities, showing that suggestions from lead investors can enhance willingness to invest in distant regions. Furthermore, Wood *et al.* (2020) pointed out that BANs facilitate the discovery, evaluation, and strategic coordination of investment opportunities among their members, thereby promoting efficient investment activities and achieving economies of scale. Drover *et al.* (2015) emphasized that BANs enhance the effectiveness of investment activities by fostering cooperation and mutual support among BAs through the sharing of knowledge and capital.

In terms of BA investment behavior, research has increasingly focused on the decision-making processes and approaches involved (Drover *et al.*). BAs rely on a staged cognitive process in making investment decisions. In the initial stages, they use heuristic techniques to quickly narrow down a large pool of potential investments, followed by more detailed and systematic evaluations to finalize their selections. This staged approach enables BAs to make flexible and efficient investment decisions, particularly in the context of regional startups. Additionally, Martins *et al.* (2021) argued that entrepreneurs' social capital significantly increases their opportunities to connect with BAs, thereby influencing investment decisions. The utilization of social capital by entrepreneurs can attract BA investments, potentially accelerating the growth of regional startups.

While third-generation research has advanced our understanding of how collaboration among investors functions, many aspects of these mechanisms remain unclear (Drover *et al.*, 2017). Despite having an influence on par with, or even surpassing, that of VC or corporate venture capital (CVC), BA investments have been relatively underappreciated in academic research. There is a recognized need to systematically understand the diverse investment behaviors and processes of BAs to deepen the theoretical understanding within the venture finance field. In the context of regional startups, emphasis has been placed on how BAs efficiently diversify risk and gather information through informal networks. Future research should focus on elucidating how the diverse investment behaviors and decision-making processes of BAs contribute to regional economic revitalization, with the aim of translating these insights into concrete policy recommendations.

2.5. Summary of previous research and research question formulation

In this chapter, we reviewed the impact of BA investment behavior on regional startups by categorizing previous research findings by generation and clarifying the theoretical background. The first-generation studies identified information asymmetry as a major barrier to startup fundraising, highlighting the crucial role of BAs in alleviating this challenge. The subsequent second-generation research emphasized the importance of collaboration between BAs and VCs, as well as the effectiveness of BANs in revitalizing regional economies, suggesting the need for policy support.

Furthermore, third-generation studies from the 2010s onwards have demonstrated that BAs utilize informal networks and syndications to mitigate risks and bridge information gaps between regions. The use of a staged evaluation approach has been found to enable flexible and efficient investment decisions, thereby effectively supporting funding for regional startups. Additionally, these processes indicate that the social capital of entrepreneurs plays a significant role in influencing BA investment decisions.

Building on the findings from previous studies, this research formulates the following research questions. First, how are growth strategies evaluated in long-distance BA investments in regional startups? Second, how does social capital influence BA investment decisions? This study aims to empirically analyze these aspects to provide a deeper understanding of the factors driving BA investments in regional areas.

3. Research methodology
3.1. Databases and dataset

In this study, data was collected from two databases—press releases and a comprehensive startup database—to identify the characteristics of BA investments in Japanese startups across different regions. The choice of these databases was based on their reliability and comprehensiveness, as they are widely used in other academic research as effective data sources.

PR TIMES is a press release distribution service that extensively covers announcements from Japanese companies, with over 100,000 registered companies and more than 2 million cumulative press releases as of July 2024. This service allows for the timely acquisition of up-to-date information on startup fundraising and business developments. Press releases serve as a crucial source of information for external stakeholders seeking access to a company's internal activities. Startups, in particular, leverage press releases to strategically showcase their value and attract investor interest. In this study, 849 cases of BA investments from press releases published between 2005 and September 2024 were extracted to form the foundation of the analysis.

STARTUP DB is a comprehensive database covering Japanese startups, including detailed information such as funding dates, amounts raised, and investor profiles. STARTUP DB defines startups as companies that leverage innovative technologies and new business models to achieve rapid growth and aim for short-term exits through fundraising. This definition underscores that the core attributes of startups include new ventures and technological innovation, thus encompassing a sizable number of relatively young and small businesses. The database includes over 10,000 registered companies, including publicly listed firms, positioning it as a reliable resource for data on startups.

Furthermore, the information disclosed by companies through press releases and media channels plays a critical role in enabling external investors to evaluate a company's future prospects and make strategic decisions. This is particularly important as professional investors often face challenges in directly accessing internal information from startups, leading them to rely heavily on self-disclosed information.

Based on data gathered from PR TIMES and STARTUP DB, this study compares the characteristics of BA investments in Tokyo versus regional areas to uncover region-specific investment patterns. Specifically, the dataset includes 849 BA investment cases extracted from PR TIMES, supplemented by an additional 4,397 cases obtained from STARTUP DB, resulting in a total dataset of 5,246 cases. This dataset supports a detailed analysis of investor classifications and investment patterns, serving as a critical resource for understanding the funding challenges faced by regional startups.

3.2. Data preprocessing and filtering

To analyze the investment trends of BAs in Japanese startups using data collected from PR

TIMES and STARTUP DB, this study first conducted data preprocessing and filtering. This process aimed to enhance data accuracy and improve the reliability of the analysis results.

Initially, Japanese text data collected was subjected to morphological analysis and tokenization using the Janome library. This method decomposed the text into individual words and identified their parts of speech, allowing for the extraction of relevant information necessary for analysis. Specifically, by removing unnecessary phrases and less meaningful expressions, we effectively extracted useful keywords from each document, thereby improving the precision of the dataset.

Next, familiar words and proper nouns (e.g., company names and product names) were filtered out to eliminate noise. This filtering clarified the region-specific topics, enabling a better understanding of the factors that attract BAs to regional startups and the differing investment criteria for startups in Tokyo.

Additionally, the "funding amount" field in STARTUP DB, originally containing string data, was converted into numerical data, and date data was standardized into a unified format. This standardization enabled more precise quarterly time-series analysis, allowing for accurate comparisons of fundraising trends between Tokyo and regional areas.

Investor information was further categorized into six distinct groups: "VCs and institutional investors," "BAs," "financial institutions," "venture lenders (VL)," "crowdfunding (CF)," and "subsidies/grants." For cases involving multiple investor types, a new field labeled "investor combinations" was created to allow for a detailed analysis of investment patterns. This categorization laid the groundwork for analyzing how the involvement of different investor types and their combinations impact fundraising.

Through these preprocessing steps, a foundational dataset was established to more accurately analyze regional differences in BA investment tendencies and characteristics in startup funding. This, in turn, enables empirical analysis to uncover the focal points of BAs' interest in the growth strategies of regional startups, as well as the influence of social capital on investment decisions.

3.3. Analysis methods

This study aims to identify regional differences in investment trends among Japanese startups using a topic model approach. By employing text mining techniques, it seeks to highlight the reasons behind BAs' interest in regional startups and differences in their investment criteria.

Initially, a topic model was constructed using Non-negative Matrix Factorization (NMF) on the preprocessed text data. The text data was vectorized using TfidfVectorizer to quantify the importance of each term, enabling the extraction of region-specific topics. This approach clarified differences in the sectors and growth strategies that attract attention to startups in regional areas compared to Tokyo.

For the analysis of funding amounts, cases were categorized into six funding ranges: 0-10 million yen, 10-50 million yen, 50-100 million yen, 100-500 million yen, 500-1,000 million yen, and above 1,000 million yen. The distribution of investor types across these ranges was then analyzed, revealing differences in the levels of investor engagement and the regional investment structures.

Furthermore, the frequency of fundraising by each company was examined, with calculations of total, average, and median funding amounts to understand long-term funding trends. This analysis visualized the differences in fundraising continuity and growth potential between companies in Tokyo and those in regional areas, highlighting the challenges faced by regional firms.

A quarterly time-series analysis was conducted, tracking fundraising trends from Q3 2023 to Q3 2024. This revealed changes in fundraising activities following the stabilization of the Covid-19 pandemic, highlighting differences in regional growth and stability.

Lastly, an analysis of the combination patterns of various investor types was conducted to examine the impact of investor collaboration on fundraising outcomes. This analysis clarified how different combinations of investors influence funding amounts across regions, providing insights

that could contribute to the development of effective fundraising strategies for regional companies.

3.4. Topic reliability and evaluation

To assess the reliability of the topics extracted using NMF, coherence-based validation was conducted. Coherence is a measure that quantifies the consistency of frequently co-occurring words within each topic and is widely used to evaluate the interpretability and consistency of topics. Specifically, coherence scores were calculated using an evaluation metric based on the interrelations among the top word pairs within each topic, with higher coherence scores achieved when there is a strong association among words within a topic.

In this study, priority was given to interpreting topics with particularly high coherence, verifying that the topics extracted for regional areas and Tokyo reflect the unique characteristics of fundraising in each region. By focusing on topics with high coherence, it was possible to capture regional investment behavior trends and BA areas of interest in a reliable manner. For topics with lower coherence, additional preprocessing and adjustments to the topic model were made, and reevaluation was conducted to enhance consistency in the analysis results. Through this approach, a robust topic model was constructed that accurately reflects the characteristics of fundraising in regional areas and Tokyo, ensuring that data-driven interpretations are highly dependable.

Based on the research methodology outlined above, the dataset collected from PR TIMES and STARTUP DB established a foundation for clarifying how BA investment behavior differs between startups in regional areas and Tokyo, as well as how unique investment characteristics emerge across regions. The analysis of investor combination patterns and the topic model results conducted in this study play a crucial role as foundational material for the discussion elaborated in the next chapter.

4. Analysis results
4.1. Comparison of quarterly fundraising trends and background

This section analyzes quarterly fundraising trends in Tokyo and regional areas based on data from Q3 2023 to Q3 2024 and examines the underlying factors influencing these trends. The focus is on assessing the stability of fundraising activities and identifying factors that drive fluctuations. By highlighting the differences in fundraising environments faced by startups in Tokyo versus regional areas, this analysis aims to elucidate the unique characteristics and challenges of the investment landscape across different regions.

Table 1. Quarterly fundraising statistics in Tokyo and regional areas (Q3 2023 - Q3 2024)

Quarter	Region	Number of Cases	Total Amount Raised (million yen)	Average Amount Raised (million yen)	Standard Deviation (million yen)	Median (million yen)
2023Q3	Tokyo	135	47,539	352.1	120.4	50
2023Q3	Regional	45	3,473.80	77.2	88.5	35.7
2023Q4	Tokyo	120	28,069.80	233.9	110.9	76
2023Q4	Regional	30	5,224.00	174.1	92.3	41.5
2024Q1	Tokyo	97	36,737.40	378.7	115.6	49
2024Q1	Regional	19	1,994.80	105	73.4	30
2024Q2	Tokyo	109	49,086.00	450.3	128.7	53
2024Q2	Regional	25	3,015.00	120.6	78.1	22
2024Q3	Tokyo	69	40,431.00	586	135.8	70
2024Q3	Regional	16	4,050.00	253.1	95.4	15

Source: Compiled by the author

Table 1 presents the quarterly fundraising amounts and associated statistical indicators for Tokyo and regional areas. The data reveals that fundraising amounts in Tokyo remain relatively stable each quarter, with total funding exceeding 40,000 million yen in both Q2 and Q3 of 2024. In

contrast, regional areas exhibit significantly lower numbers of deals and amounts raised compared to Tokyo, with marked quarterly fluctuations. These disparities can be attributed to differences in the composition of investors and the availability of funding across regions.

In Tokyo, startups benefit from a stable fundraising environment, as evidenced by consistent average and median funding amounts. For instance, the average funding amount in Q2 2024 reached 450.3 million yen, indicating active investment in larger deals. This stability reflects Tokyo's status as the economic center of Japan, where a diverse range of investors are concentrated, enabling startups to access a wide pool of capital. As Florida and Kenny (1986) suggest, the involvement of VCs and financial institutions plays a significant role in ensuring the stability of funding activities in Tokyo.

Conversely, fundraising in regional areas remains unstable, with significant quarterly fluctuations. For example, while the total amount raised in Q4 2023 was 5,224 million yen, it declined to 1,994.8 million yen in Q1 2024. This instability highlights the challenges faced by regional startups in securing funding. These companies are often involved in smaller-scale projects, leading to lower median funding amounts and difficulty in securing large-scale growth capital. This can be attributed to a strong risk-aversion tendency among regional investors, particularly VCs and financial institutions, who adopt a more cautious approach. Additionally, as noted by Sudek (2006) and Martins *et al.* (2021), information asymmetry between investors and entrepreneurs in regional areas serves as a barrier to fundraising.

Examining the trend in average quarterly funding amounts, Tokyo demonstrates stable growth, whereas regional areas remain at relatively low levels. In particular, in Q3 2024, the average funding amount in Tokyo reached 586 million yen, while in regional areas, it remained at 253.1 million yen. This discrepancy underscores the role of Tokyo's abundant economic resources and dense networks in supporting startup growth. In contrast, the lack of diversification in funding sources and the limited expansion of the investor base in regional areas constrain the growth of startups there.

The analysis of Table 1 clearly indicates a significant disparity in the fundraising environments between startups in Tokyo and those in regional areas. Notably, the instability of funding in regional areas emerges as a critical issue, reflecting the need for strategies to enhance the accessibility and stability of capital for regional startups.

4.2. Investor combination patterns and their impact on fundraising

This section analyzes the impact of investor combination patterns on startup fundraising in Tokyo and regional areas, based on Table 2. The focus is on examining how the involvement of diverse types of investors and their combinations influences the amounts raised. By investigating these dynamics, this analysis aims to uncover region-specific investment behaviors and characteristics.

The data in Table 2 reveals that in Tokyo, a wide range of investors actively participate across various funding amounts. Notably, VCs and institutional investors play a leading role, particularly in large-scale deals (over 1,000 million yen), where there is frequent collaboration between VCs and other investors. In Tokyo, the number of deals involving VCs and institutional investors reaches 1,249, with an impressive average funding amount of 359.6 million yen. This diverse investor involvement is believed to contribute to both the stability and scale of fundraising for startups. Furthermore, in cases where VCs collaborate with BAs, the average funding amount reaches 215.9 million yen, particularly benefiting mid-sized deals (50-500 million yen).

Table 2. Investor combination patterns and fundraising amounts in Tokyo and regional areas

Region	Investor Combination Pattern	Number of Cases	Average Fundraising Amount (million yen)	Median (million yen)	Fundraising Range (million yen)
Tokyo	VC and Institutional Investors	1249	359.6	83.0	0-10,000
Tokyo	VC + BA	454	215.9	78.0	10-500
Tokyo	VC + Financial Institutions	19	1208.9	296.0	500-1,000
Tokyo	BA	265	24.2	0.0	0-10
Tokyo	Financial Institutions	102	1009.8	253.5	over1,000
Tokyo	Subsidies/Grants	22	36.4	0.0	0-500
Tokyo	VL	18	651.2	0.0	0-1,000
Tokyo	CF	44	20.8	19.4	0-100
Regional	VC and Institutional Investors	233	156.3	50.0	0-500
Regional	VC + BA	82	163.4	52.5	50-500
Regional	BA	52	33.1	9.0	0-50
Regional	Financial Institutions	23	260.3	70.0	100-500
Regional	Subsidies/Grants	14	36.4	0.0	0-500
Regional	VL	3	486.6	300.0	100-500
Regional	CF	16	20.8	19.4	0-100

Source: Compiled by the author

In contrast, in regional areas, the involvement of VCs and institutional investors is relatively limited. For smaller-scale deals (0-50 million yen), investments are predominantly led by BAs alone. According to Table 2, the number of BA-led deals in regional areas is 52, with an average funding amount of just 33.1 million yen. This indicates that regional startups largely rely on individual investors, making it challenging to secure substantial funding. While there are cases of collaboration between VCs and BAs in regional areas, the average funding amount remains lower at 163.4 million yen compared to Tokyo. This trend suggests a stronger risk-aversion tendency among regional investors, resulting in limited access to growth capital for startups.

Additionally, there are notable differences in the cases were banks function as sole investors. In Tokyo, the average funding amount for bank-led deals is significantly high at 1,009.8 million yen. In contrast, the involvement of banks in regional areas is limited, with a much lower average funding amount of 260.3 million yen. This reflects the cautious stance of regional banks, who are less inclined to participate in large-scale investments.

These differences in investor combination patterns have a substantial impact on both the scale and stability of fundraising. In Tokyo, VCs and institutional investors collaborate with other investors to diversify risks and provide funding for a wide range of projects, thereby supporting the growth of startups. In contrast, regional areas rely heavily on BA-led investments, which lack diversity in funding sources, leading to constraints on the growth of startups. As noted by Sudek (2006) and Martins *et al.* (2021), while BAs are actively involved in regional investments, challenges remain in terms of funding stability and scale.

Overall, for regional startups to secure stable funding for mid-sized to large-scale projects, it is crucial to strengthen the collaboration between VCs, banks, and BAs, and to establish networks that can overcome region-specific risks. Future investment strategies should focus on fostering cooperative engagement among investors in regional areas, thereby building a supportive ecosystem that ensures the sustainable growth of startups.

4.3. Topic model analysis and its impact on business angel investment behavior

This section examines how the results of the topic model analysis, as presented in Table 3,

influence the investment behavior of investors, including BAs, in both Tokyo and regional areas. Specifically, it explores how advancements in various industries and technologies shape the interests of investors and how these factors are reflected in the allocation of funding to startups across different regions.

Table 3. Topic model in Tokyo and regional areas

Region	Topic	Keywords	Coherence
Tokyo	0	Platform0.218 + Finance0.204 + Support0.200 + Logistics0.195 + Usage0.187 + Start0.184 + Operations0.183 + Product0.179 + DX0.176 + Management0.176	0.76
Tokyo	1	Loan1.049 + Housing0.969 + Real Estate0.262 + Finance0.185 + Interest Rate0.167 + Borrowing0.159 + Refinancing0.143 + Online0.101 + Comparison0.095 + Probability0.092	0.79
Tokyo	2	AI0.883 + Learning0.325 + Data0.245 + Research0.164 + English Conversation0.155 + Analysis0.150 + Processing0.145 + Intelligence0.128 + Machine0.127 + Robot0.122	0.81
Tokyo	3	Development0.545 + Exercise0.421 + Employment0.390 + Therapy0.311 + Children0.253 + Medical0.237 + Support0.219 + Association0.215 + Disability0.190 + Child0.189	0.73
Tokyo	4	Recruitment0.582 + Reference0.486 + Introduction0.486 + Hiring0.263 + Talent0.260 + Candidate0.245 + Job Change0.227 + Posting0.212 + Selection0.153 + Monthly0.130	0.77
Tokyo	5	Beauty0.391 + Video0.327 + Creator0.253 + Content0.247 + Voicy0.244 + Virtual0.229 + VR0.222 + Video Production0.181 + Media0.180 + Audio0.174	0.74
Regional	0	Loan0.319 + Support0.233 + Agriculture0.217 + Region0.195 + Data0.187 + Field0.180 + AI0.174 + Construction0.167 + Investment0.162 + Inspection0.160	0.74
Regional	1	Space0.913 + Satellite0.740 + Small0.247 + Rocket0.226 + Earth0.196 + Observation0.183 + Communication0.170 + Artificial0.159 + Launch0.126 + Orbit0.111	0.78
Regional	2	Medical0.732 + Hospital0.425 + Patient0.286 + Care0.275 + ICU0.274 + Pathology0.259 + Treatment0.235 + Facility0.231 + Doctor0.197 + Remote0.186	0.82
Regional	3	Therapist1.073 + Relaxation0.399 + Home0.135 + iOS0.119 + App0.116 + Therapy0.115 + 14678561610.113 + Cognition0.107 + Usage0.104 + Appeal0.102	0.71
Regional	4	Plant0.870 + Soybean0.688 + Meat0.394 + Food0.309 + Raw Material0.307 + HTML0.224 + Protein0.160 + Climate0.160 + Gas0.155 + Earth0.153	0.75
Regional	5	Semiconductor0.557 + Equipment0.364 + Inspection0.347 + Generation0.319 + Manufacturing0.299 + Cultivate0.242 + Product0.223 + Micro0.165 + Innovation0.139 + Industry0.125	0.77

Source: Compiled by the author

The analysis of Table 3 reveals that in Tokyo, key investment themes include sectors related to digital transformation (DX), such as finance, AI, platform businesses, and creative content. Notably, areas like AI-driven learning, data analytics, and the development of online platforms have emerged as significant elements in the growth strategies of startups. These technological advancements are underpinned by the diverse investor networks concentrated in Tokyo, which ensure stability in fundraising. Particularly, the active involvement of VCs and financial institutions

accelerates the rapid growth of startups in this region.

In contrast, the topic model analysis for regional areas highlights a focus on specific industries such as agriculture, healthcare, and the aerospace sector. For example, in agriculture, the integration of AI and IoT technologies is advancing smart agriculture, thereby enhancing local agricultural productivity. In the healthcare sector, the adoption of telemedicine technologies is improving access to medical services for regional populations. These sectors are linked to solving social issues, suggesting that for BAs, the motivation for investment extends beyond economic returns to include regional contributions (Martins *et al.* 2021).

Moreover, the investment behavior of BAs in regional areas is characterized not merely by the provision of capital but by an emphasis on building social capital. As highlighted by Shimizu (2024), when investing in regional startups, BAs demonstrate a commitment to leveraging their networks and expertise to contribute to local communities. In sectors like agriculture and healthcare, which address critical regional challenges, the innovative technologies possessed by startups are expected to deliver direct benefits to these communities. In this context, social capital serves as a foundation for establishing trust between investors and firms, thereby promoting long-term investments.

The differences in topics between Tokyo and regional areas indicate that investor interests vary significantly by region. In Tokyo, digital technologies and platform businesses drive startup growth, while in regional areas, investments are more focused on sectors directly tied to resolving local challenges. Consequently, BA investment behavior must adopt a strategic approach tailored to the unique characteristics of each region.

Overall, the investment strategies in Tokyo are centered on growth driven by technological innovation, whereas in regional areas, there is a stronger emphasis on investments aimed at revitalizing local communities. These differences in investment behavior across regions offer insights into how regional startups can achieve further growth. Specifically, BA activities in regional areas play a crucial role in supporting sustainable regional development. Moving forward, it will be essential to develop investment strategies that align with the unique characteristics of each region. Strengthening investor networks and building social capital in regional areas will be vital for closing the equity gap, thereby stimulating regional economies, and providing a solid foundation for the growth of startups.

5. Conclusion

This study aimed to clarify how growth strategies and social capital influence investment decisions by BAs in regional startups in Japan. The findings suggest that BA investments in regional startups rely not only on profitability but also heavily on "social capital," which is based on social trust and networks.

In terms of growth strategies, BAs tend to invest in specific industries and technological areas within regional startups. BAs show particular interest in technological innovation in region-specific sectors such as agriculture, healthcare, and aerospace, where strategies with growth potential are highly valued as investment targets. Growth strategies in regional industries are appreciated not only as sources of future returns but also from the perspective of contributing to local communities and supporting sustainable development. Shimizu (2024) demonstrated that BAs making long-distance investments place importance on social contributions, human connections, and shared values. This alignment of growth strategies in regional areas with investor values contributes to investment motivation.

Clear insights were also obtained regarding the impact of social capital on BA investment decisions. As highlighted by Martins *et al.* (2021), social capital—defined by trust, the formation of social networks, and civic engagement—plays a crucial role in promoting investments in regional areas. Japanese BAs, in particular, are often motivated not by financial returns as a primary objective but by non-monetary rewards and regional support (Tashiro 1999; Hindle and Lee 2002). Shimizu (2024) further demonstrated that Japanese BAs primarily build networks through personal and informal means, reinforcing the influence of empathy with local communities

and other investors. Thus, BAs are likely to emphasize capital provision aimed at supporting the economic and social development of local communities in cooperation with other stakeholders. In environments with widespread technological advancement, as seen in Tokyo, BAs find it easier to evaluate growth potential and actively leverage information sharing through networks with other investors. Conversely, in regional areas, the emphasis is on aligning with local industry growth strategies and community partnerships, with social capital contributing to investment stability. Therefore, BA investment behavior differs between Tokyo and regional areas, reflecting region-specific characteristics.

This study provides new perspectives on how growth strategies and social capital in regional startups influence BA investments, shedding light on the role of BAs in regional economic development. However, due to limitations in data collection and sample size, caution is needed in generalizing these findings. The insights from this study serve as foundational data for enhancing the investment environment and promoting regional economic development, with further in-depth analysis expected to contribute to the revitalization of Japan's startup ecosystem.

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