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First Research Agenda on BAs and CIs

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1. Introduction

Business Angels (BAs) and Crowd investors (CIs) are mostly known due to their role in filling the equity gap in the very early stage of firm's life cycle (Bonini Capizzi and Zocchi, 2019b). While research on these actors has been developing considerably, there is still a call for more empirical evidence on BAs and CIs contribution to new enterprises. In particular, it is widely recognized that a significant gap exists with respect to the connection between investors' human capital (HC) and the growth and performance of startups. Within entrepreneurial finance literature, Human Capital studies have predominantly considered the importance of entrepreneur's HC in attracting early-stage financing and fostering startup survival and success. The less explored perspective considers investors' human capital and aims to investigate whether and how human capital features can impact ventures.

As part of Work Package 1, this report is intended to summarize the key aspects of the literature review process, to map the major contributions on BAs and CIs with a focus on investor HC, and to identify the gaps and research challenges.

The report is structured as follows, section 2 explains the methodology adopted to perform the literature review, section 3 presents a bibliometric overview on selected studies, section 4 presents the main contents of extant publications. Finally, section 5 points out the scope for future research.

2. Literature review methodology

The structuring of the literature review on BAs and CIs support to entrepreneurship has been performed with a focus on Human Capital traits and their contribution to the growth and performance of entrepreneurial firms. We therefore considered academic research that has developed within BAs and CIs literature streams as a starting point, and, subsequently, deepened the narrower stream of Human Capital. We carried on the collection of relevant sources from databases Scopus and Web of Science. We selected inherent contributions that are written in English and published as articles in peer-reviewed Journals, books, book chapters, reports and conference proceedings. A coding process of sources has been carried on using an inductive approach to identify thematic areas based on abstracts, research questions and hypotheses. Human Capital variables and methodological approaches are also collected. Relevant publications on the current state of art have been organized in a table format, which also constitute the starting point for critical analysis.

Overall, we found 62 sources that investigate human capital traits within BAs and CIs literature. More in detail, 35 sources refer to the Business Angels literature, and 27 to Crowd-investors literature.
Starting from the BAs relevant literature, all selected sources had been published between 2002 and 2025, with 77% of sources pertaining to the last decade (2015-2025). The majority of sources are peer-reviewed articles, with two exceptions of a book chapter and a EIF report.

On Crowd-investor literature, publication date ranges from 2015 to 2025, with 70% of contributions being published after 2020. With respect to the nature of sources, just two of them are book chapters, the remaining studies are peer-reviewed papers.

3. Bibliometric analysis

Bibliometrics is the field that quantitatively studies bibliographic material providing a general overview of a research field (Broadus, 1987). In the current study, we conduct a bibliometric analysis of the selected publications to identify the structure and relationships of the scientific literature on Business Angels' and Crowd investors' human capital. To do so, we retrieve bibliographic data from Scopus Database and utilize the Bibliometrix software (Aria and Cuccurullo, 2017). Bibliometrix is an R-tool designed to perform science mapping analysis, it can provide visual representation of the literature through using a variety of bibliometric techniques, such as citation, collaboration, and co-word analysis.

3.1 BAs

The selected contributions pertaining to BA literature have been represented in Figure 1, which highlights the annual number of publications and reveals a growing trend over time.

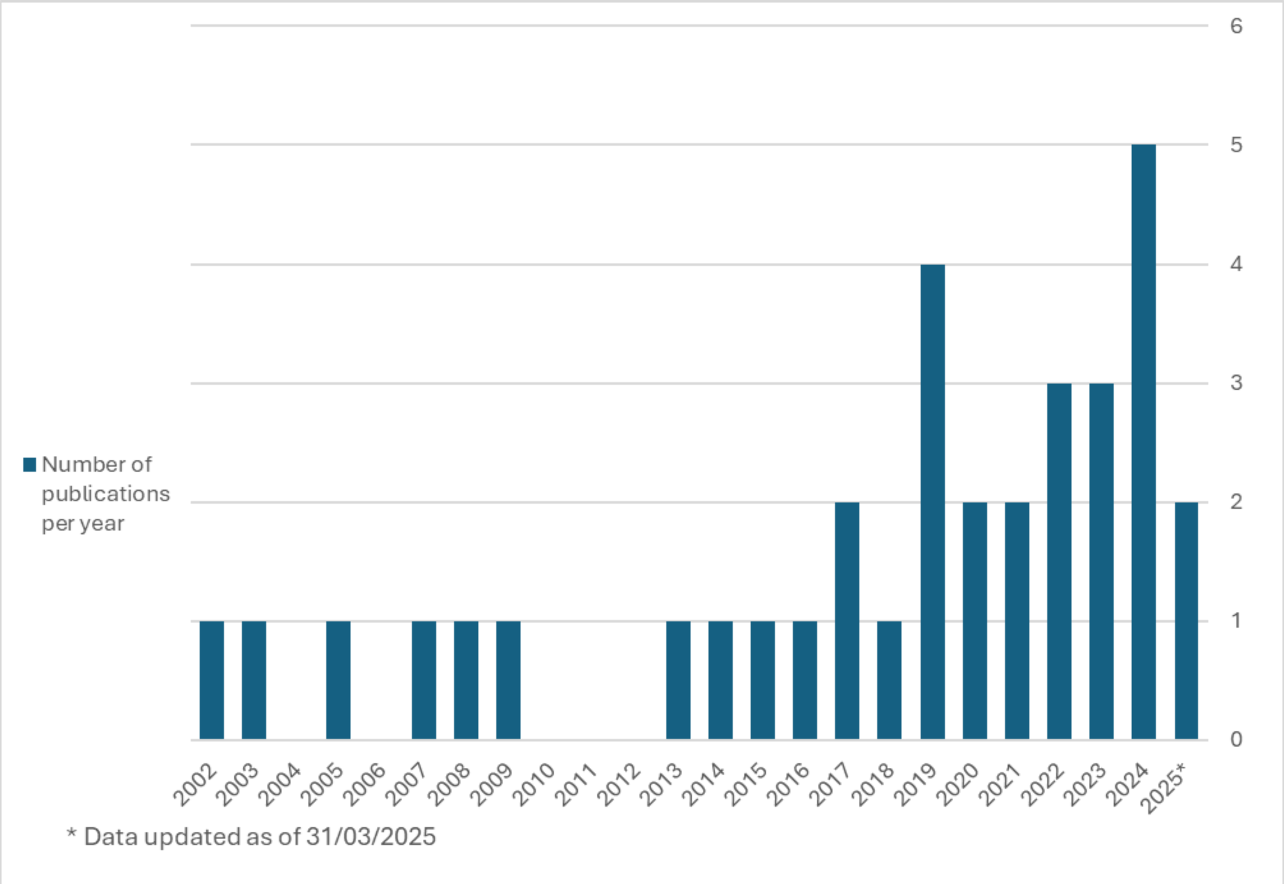

Fig. 1: Number of publications per year

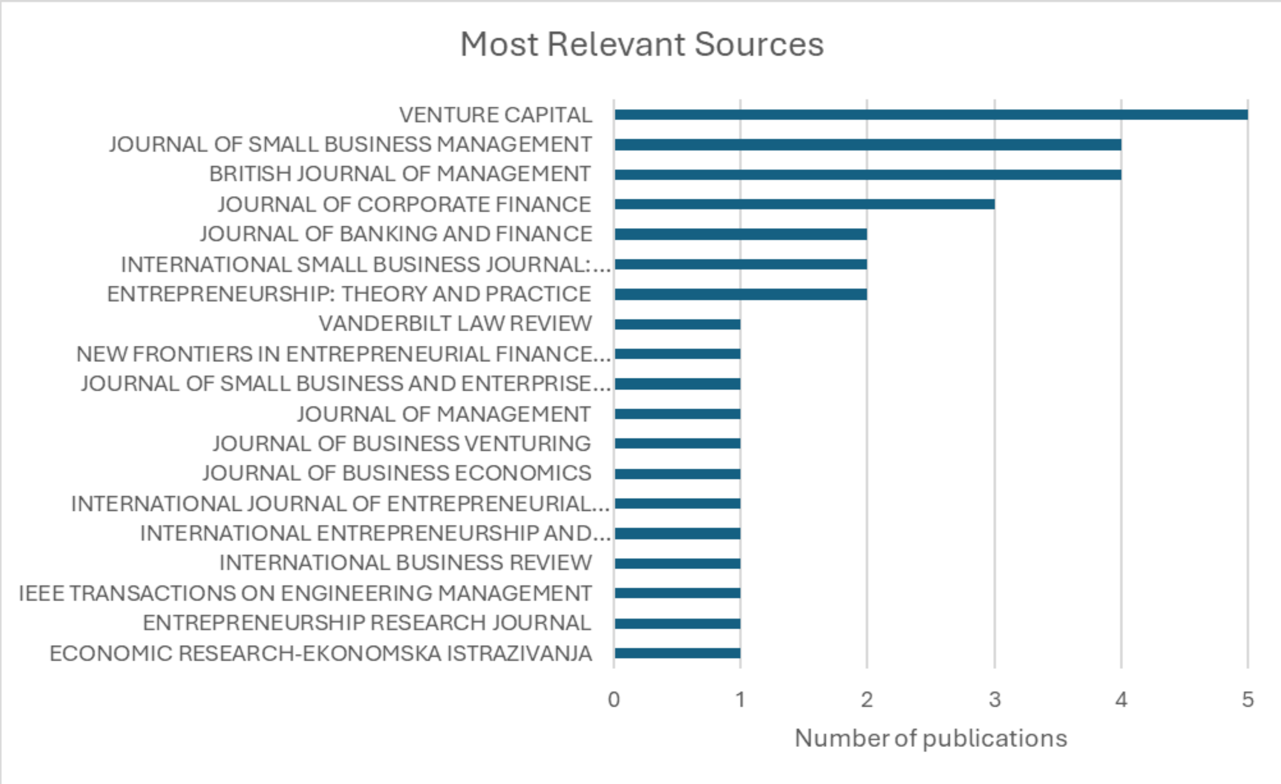

Fig. 2: Journal ranking according to total number of publications

While spanning across 19 journals, BAs' human capital has been mostly covered in the Venture Capital, British Journal of Management, Journal of Small Business Management and Journal of Corporate Finance (Fig.2).

Figure 3 represents the most influential authors within this batch of contributions and their production overtime. This graph denotes a period of more intense publishing activity between 2017 and 2023.

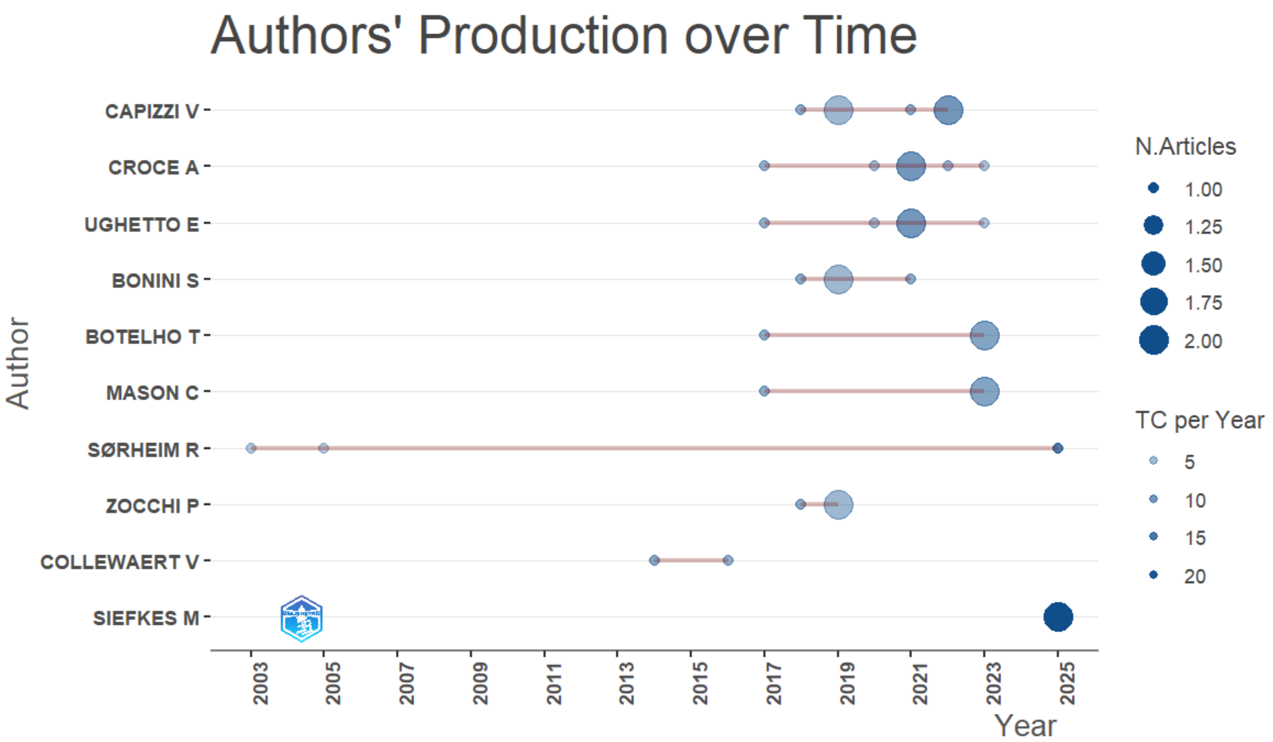

Fig. 3: Authors' production over time

Beyond descriptive analysis, co-citation analysis allows us to visualize the structure of the research field with linkages between nodes. In Figure 4, is it possible to appreciate the Journal Co-citation network, which identifies the most influential journals based on how frequently they are cited together in the reference lists of other publications. Co-citations are represented by the link between nodes. In this case, two journal clusters are frequently co-cited.

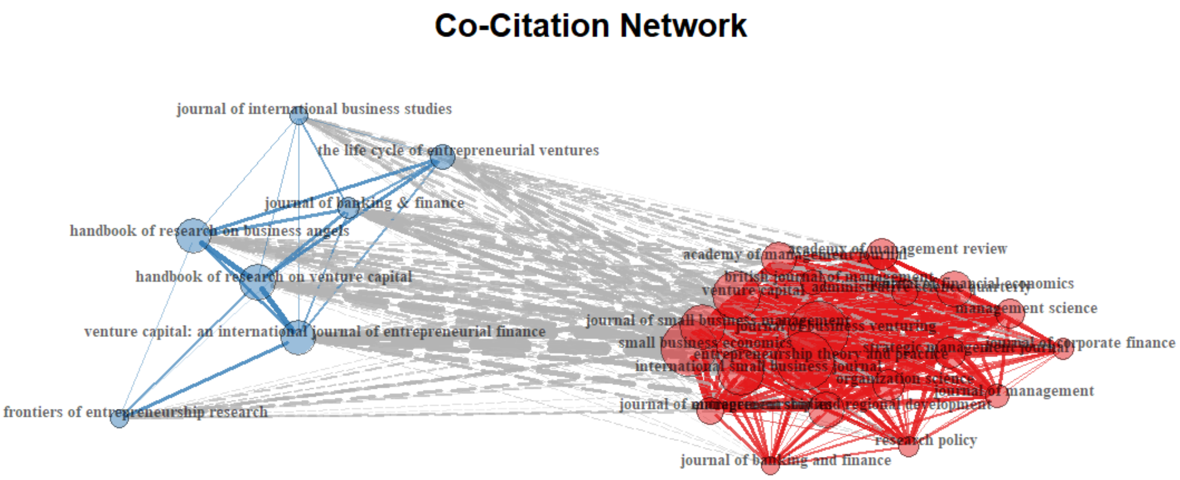

Fig. 4: Co-Citation network (Sources)

In the Conceptual Structure Map showcased in Fig. 5, words that are used together in research articles are grouped. Within this research domain, four thematic clusters of words are useful to gauge themes in current studies on human capital within BAs literature. A major group includes "knowledge", "performance", "role", "impact", "reasons"," relationship", "risk" and "women". The second one highlights, "experience" and “interviews”. The third group proposes the concepts of “green”, “sustainability” and “activities”. An isolated node cites “learning.

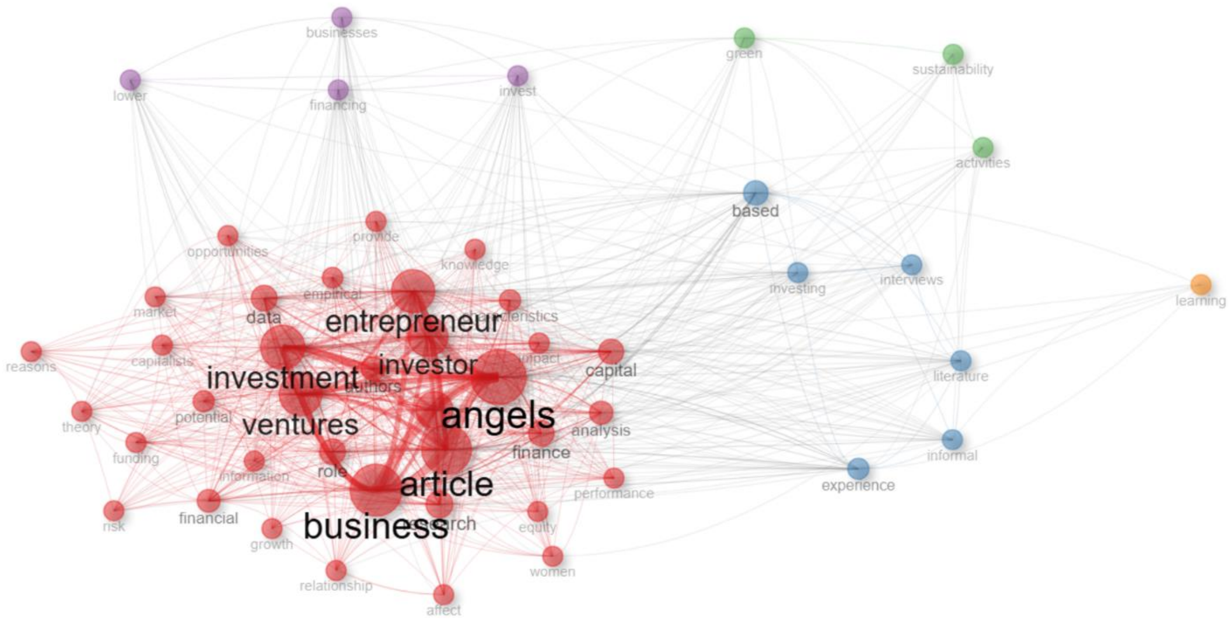

Fig. 5: Co-word analysis: Conceptual Structure Map (MCA)

Considering the Factorial map of the most cited documents (Fig. 6), the groups suggest scholars have addressed some main research strands. Studies have covered the influence of personal characteristics (including gender) on the investment activity, and whether differences in characteristics lead to differences in investments (cluster 1), how BAs experience influences the evaluation of investment opportunities and decision making (cluster 2), lastly, the role of investors on startup performance (cluster 3).

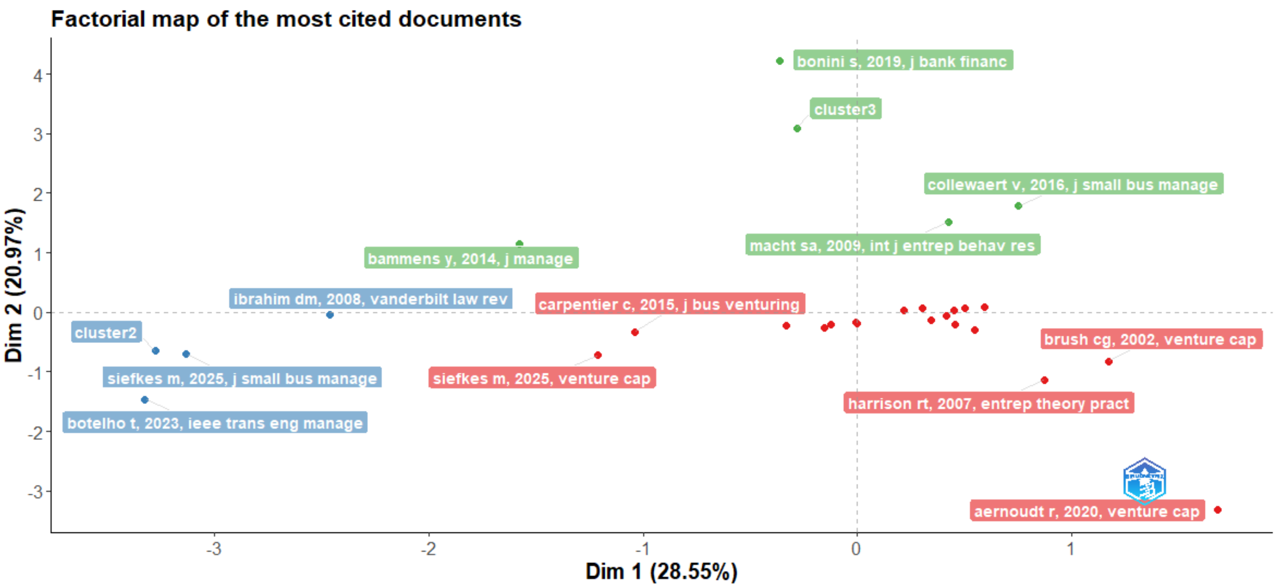

Fig. 6: Factorial Map of the most cited documents (Method: CA)

As regards Social Structure analysis, collaboration networks reveal that research on BAs' HC has been carried on by several collaborative and established teams of researchers (Fig. 7) and with main international collaborations among Italy, U.S.A. United Kingdom, France, Spain, Poland, Netherlands, Belgium and Germany (Fig. 8).

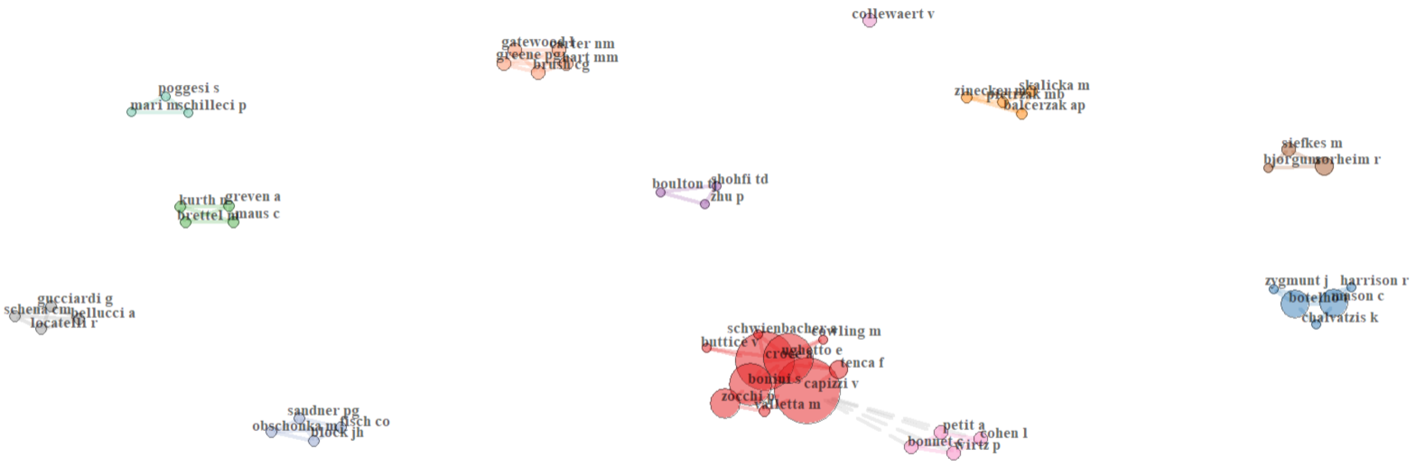

Fig. 7: Author's collaboration network

Fig. 8: Country collaboration network

3.2 CIs

Literature on CIs' human capital has seen a more recent development in light of the newness of the crowdfunding alternative. In fact, the first publications in our selected sample date to 2015, however the number of studies in the last five years showcases increasingly growing scholarly attention (Fig. 9).

Although the literature on CIs' human capital extends across 20 sources, the majority of contributions are concentrated in Small Business Economics, Entrepreneurship: Theory and Practice, Finance Research Letters and Journal of Cleaner Production (Fig. 10). Figure 11 illustrates the most prominent authors, highlighting their scholarly output. In this case, the graph marks the period of greater publication activity between 2023 and 2024.

The Journal Co-citation network, showcased in Fig. 12, reveals the presence of three distinct groups of journals that are more frequently co-cited, reflecting thematic or disciplinary affinities.

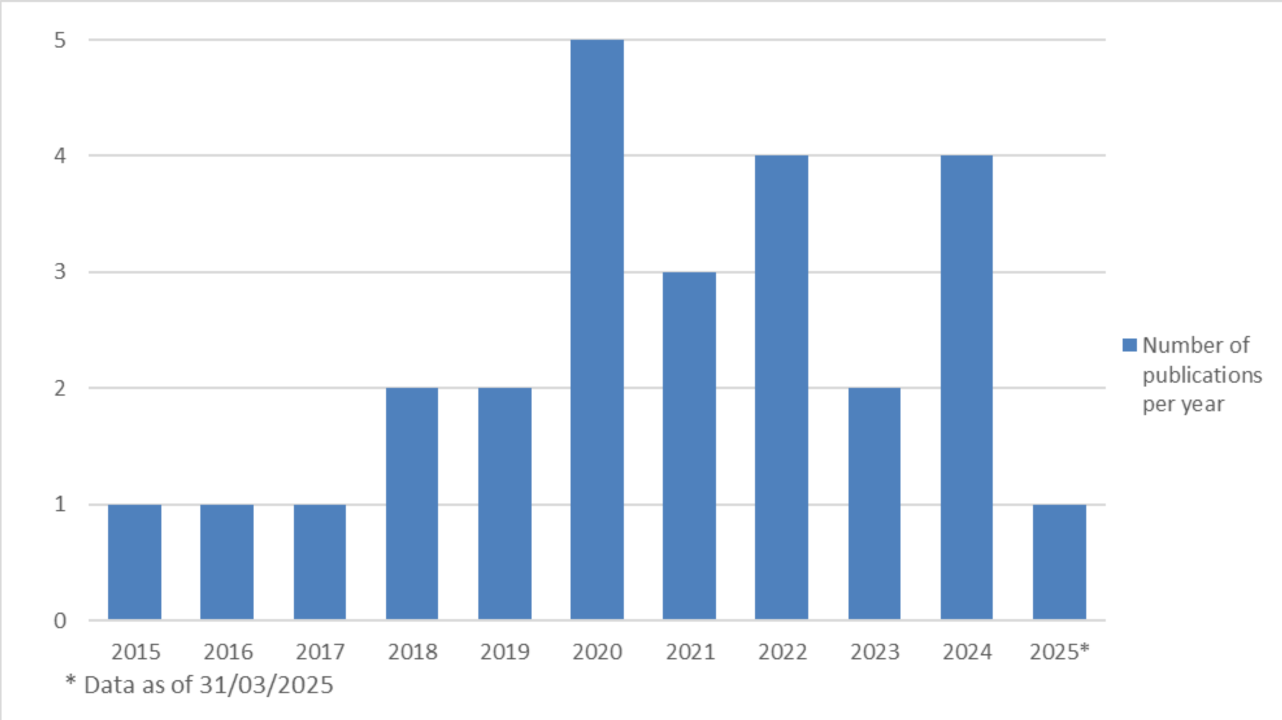

Fig. 9: Number of publications per year

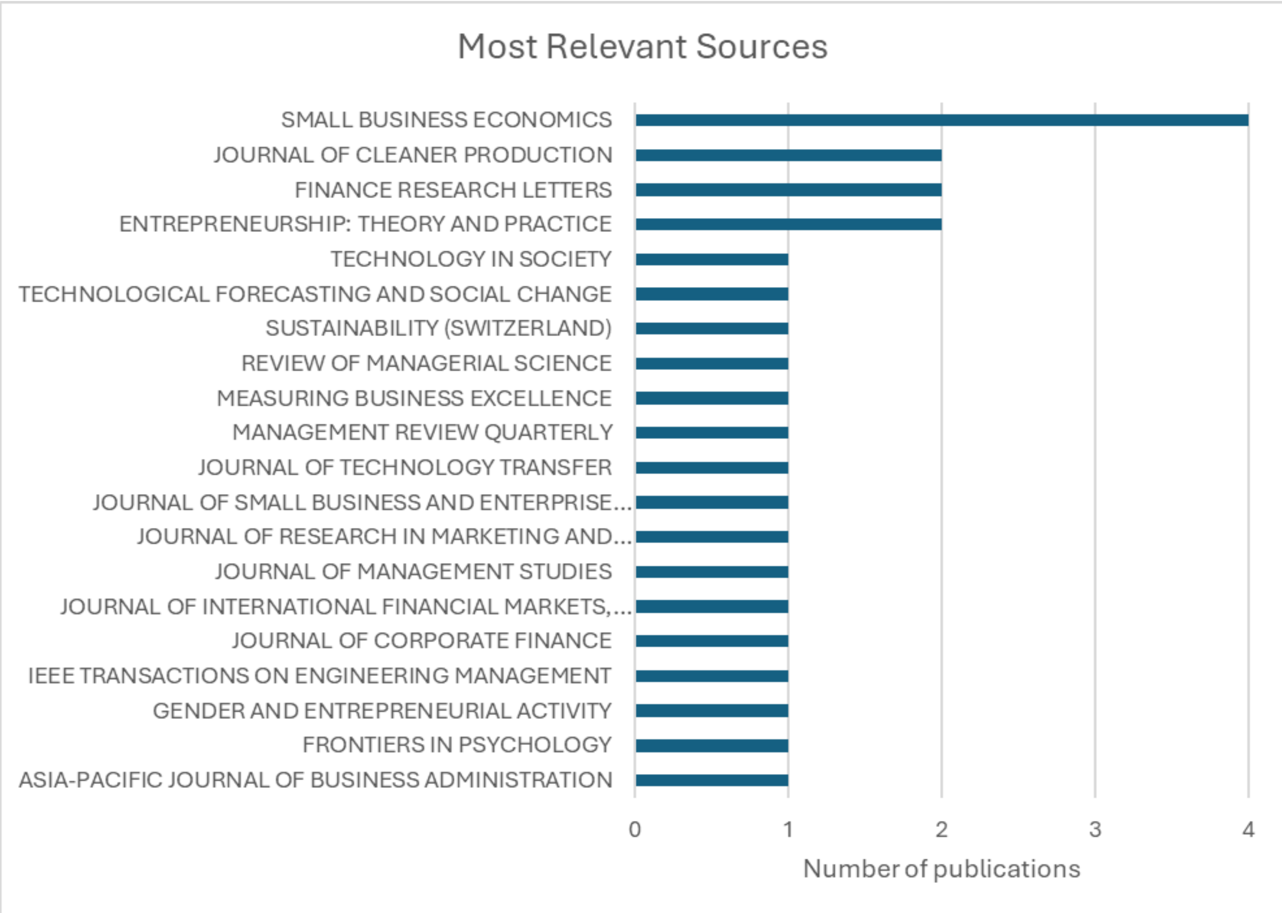

Fig. 10: Journal ranking according to total number of publications

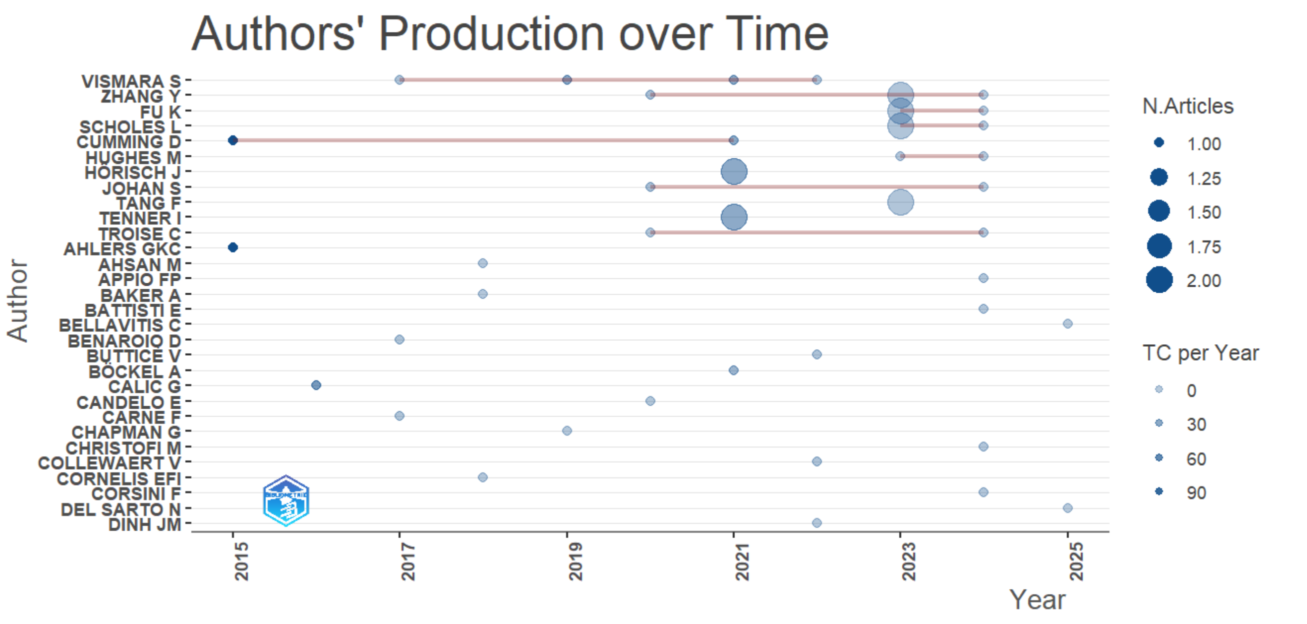

Fig.11: Authors' production overtime

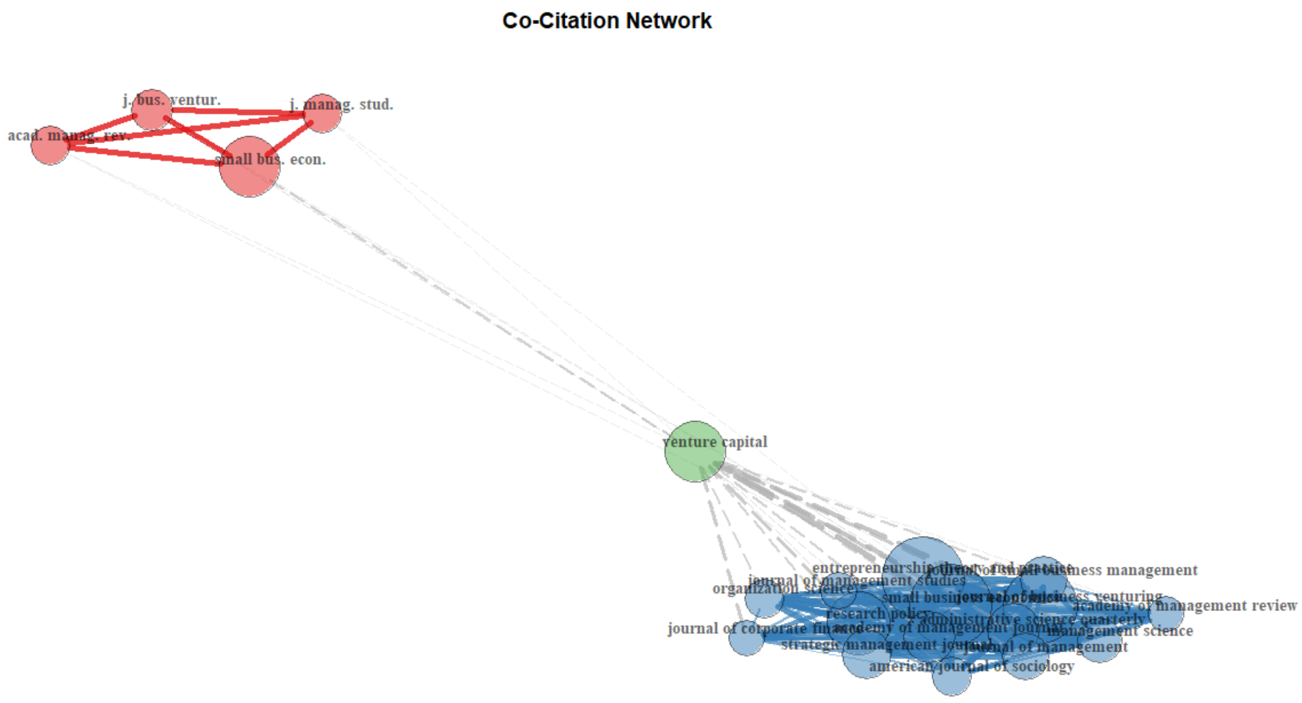

Fig. 12: Co-Citation network (Sources)

In the Conceptual Structure Map in Fig. 13, it is possible to visualize the terms that frequently appear together forming three main clusters. The first group encompasses the concepts of "campaign", "sustainability", "behavior", "backers". The second one, proposes the concepts of "values", "signals", "impact", "quality". The third group highlights the words "role", "lead", "female" and "decisions".

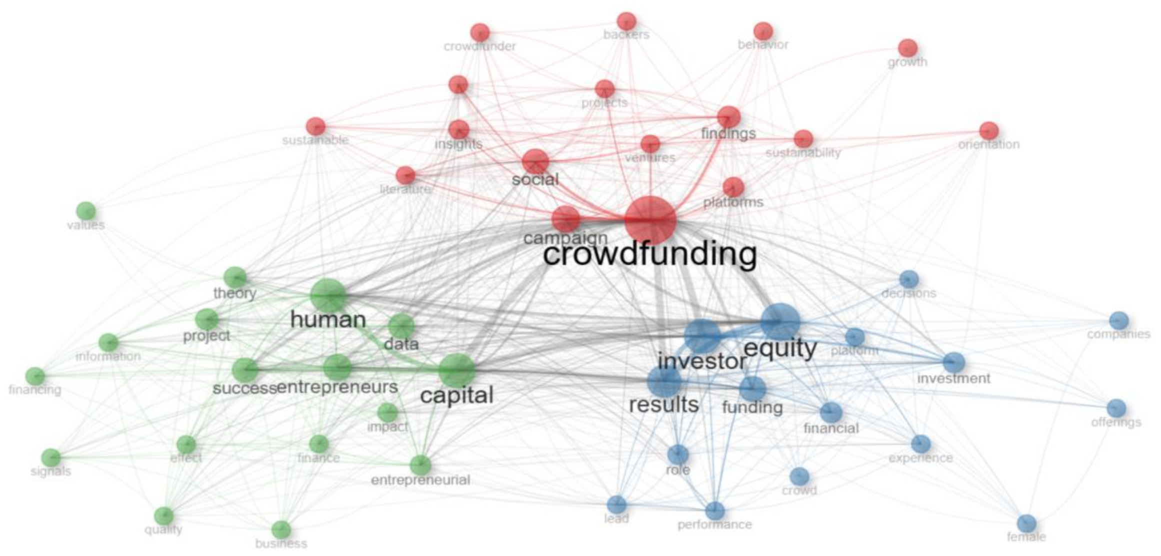

Fig. 13: Co-word analysis: Conceptual Structure Map (MCA)

Additionally, the Factorial map of the most cited documents (Fig. 14) delineates three evident subgroups. The latter subgroups suggest that, within CIs literature, the human capital has been studied considering also the various elements of investors human capital (cluster 1), campaign success factors (cluster 2) and sustainability (cluster 3).

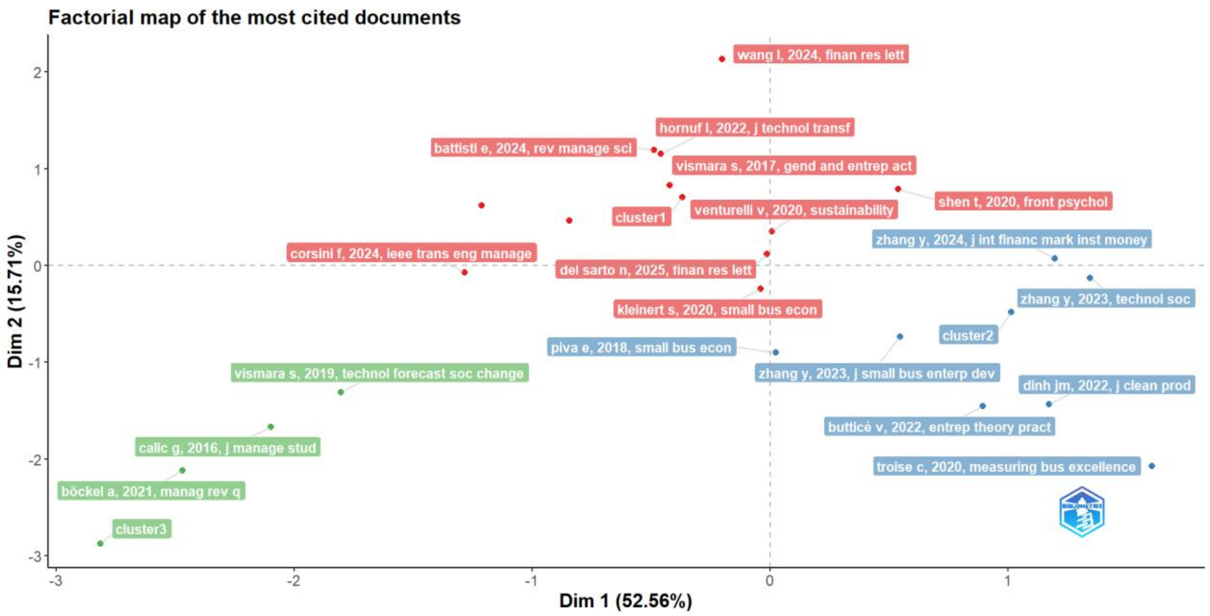

Fig. 12: Factorial Map of the most cited documents (Method: CA)

With respect to the Social Structure analysis, Figure 13 visualizes the collaboration among authors. Furthermore, the analysis highlights significant international collaborations, particularly among organizations based in Italy, the United Kingdom, the United States, Germany, China, Belgium, the Netherlands and Canada (Fig. 14).

Fig. 13: Author's collaboration network

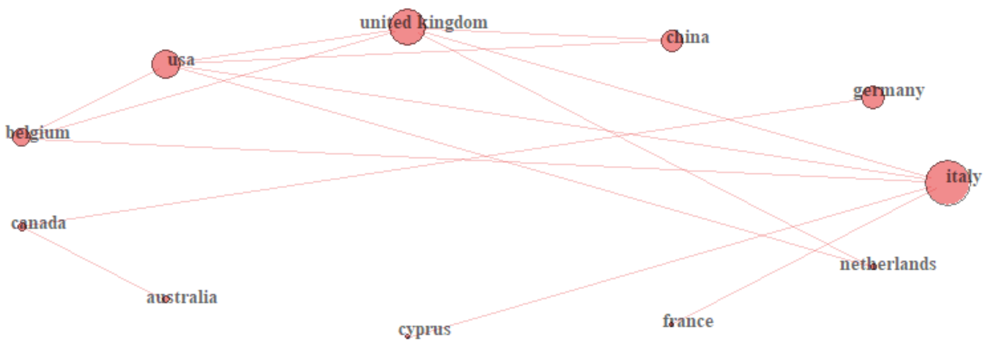

Fig. 14: Country collaboration network

4. Thematic areas

4.1 BAs

We identified five main thematic areas: Investment behaviour, Value adding contribution, BA networks and groups, Gender dynamics and Green Investing.

Investment behaviour

Business angels' investment behaviour is at the heart of literature on BA contribution to entrepreneurial businesses. Across extant contributions, we found investors' human capital features have been investigated mostly within two grounds of BA literature. The first ground concerns the investment decision-making process, as HC components appear among the drivers of the selection criteria according to which investors formulate investment decisions, select successful startups and evaluate projects. Some research questions that have been addressed by literature on this line are: What are the motivations behind BAs investment decisions? (Mason et al. 2017) What is the role of past experience on investment motivation and selection? (Croce et al. 2020; Botelho et al. 2023a; Croce et al. 2023) What drives BAs' rejection? (Croce et al. 2017) What are BAs motivations behind green and clean tech investing? (Botelho et al. 2023a) How do BAs personal characteristics influence their investment success? (Altmeier and Fisch 2023)

Value adding contribution

The other stream of literature that is worth mentioning revolves around the investigation of value-adding contributions provided by this particular type of investors. Since business angels' contribution extends beyond fund provision, involving a hands-on approach, HC characteristics have been studied in relation to the growth and performance of portfolio companies. Some exemplificative research questions are: do business angels benefit their investee companies? (Macht and Robinson 2009); do business angels act as facilitators for further finance? (Sørheim 2005; Capizzi et al. 2022) How do BAs' individual characteristics impact venture performance? (Croce, Ughetto, Bonini and Capizzi 2021; Blaseg and Hornuf 2023) What are the post-investment survival and growth prospects for BA backed firms? (Bonini, Capizzi and Zocchi 2019a).

Furthermore, scholars have deepened the relationship between angel investor characteristics and the valuations of their investments, hypothesizing that angel investors' experience, education level, and education type affect investment expected outcome (Collewaert and Manigart 2016). Additionally, another perspective has emphasized the role of relational trust between angel investors and entrepreneurs in shaping how investors assess the performance of their portfolio ventures (Bammens and Collewaert 2014).

BA networks and groups

Notably, both research streams also consider angels' frequent practice of participating in BA groups and affiliating to a BA network. The extant contributions investigate how groups assess investment opportunities with respect to individual angels (Carpentier and Suret 2015), how the personality of BAs impacts the decision to syndicate investments (Block et al. 2018), but also whether individual angel positioning influences BA group investment (Butticè, Croce and Ughetto 2021) and how HC affects the activities performed by individual BAs within the group (Bonnet et al. 2022).

Green investing

Research has to a small extent examined green investments by BAs. On one hand, attention is given to the motivations that drive business angels (BAs) to engage in green investments (Botelho, Mason and Chalvatzis 2023). On the other hand, attention is directed towards the unique value BAs may provide to these projects in light of their familiarity and experience with sustainability themes (Siefkes, Bjørgum and Sørheim 2025), and also towards sustainability-related skills needed and developed by BAs (Siefkes 2025).

Gender

Research on gender in equity finance is considered to be still limited. Studies have explored women's roles in both the demand and supply of equity capital, unveiling the underrepresentation of women as equity providers and seekers (e.g. Brush et al. 2002). In addition, another line of inquiry has investigated whether there are significant differences between male and female business angels in terms of potential variations in investment behaviors, motivations, and the types of ventures they choose to support (e.g. Harrison and Mason 2007). Inquiry concerning both investor's and entrepreneur's gender, confirms women entrepreneurs receive less equity financing than men, with a lower probability of securing larger investments from men BAs (e.g Bellucci et al. 2024).

4.2 CIs

Human capital has been found to play a relevant role in equity crowdfunding campaigns (Ahlers et al. 2015). With reference to crowd-investors (i.e. backers), it is worth noticing that equity crowdfunding campaigns attract both professional and non-professional investors (i.e. amateurs) (Battisti et al. 2024), and still little knowledge is available about such supporters and their contributions. We identified five main thematic areas:

Crowdinvestors' investment behavior

Human capital has been considered among the pivotal elements that drive backers to invest in crowdfunding projects. As delineated in a conceptual framework, backers' experience, expertise, and personal values affect their motivations, thus their decision-making behavior, and guide them toward ventures aligned with their own human capital (Ahsan, Cornelis and Baker 2018; Wang, Feng and Zang 2024). These human capital attributes also shape how investors interpret available information provided to them. Specifically, HC affects signals amount and type, with diverse investors placing different emphasis on them (Butticè et al. 2022). Importantly, research has also acknowledged that human capital functions as a multidirectional signal within the investment environment. The literature on equity crowdfunding has studied the signals sent by entrepreneurs through their own human capital characteristics and their information disclosing style, concluding that such signals serve as proxies for venture quality and can affect the outcome of fundraising campaigns (Piva and Rossi-Lamastra 2017; Johan and Zhang 2020). However, recent studies show that the human capital of lead investors is equally influential. Experienced lead investors enhance campaign legitimacy and attract other backers by signaling credibility and trustworthiness (Kleinert, Volkmann, and Grünhagen 2020; Shen et al. 2020; Zhang et al. 2023a). However, the effectiveness of these signals is contingent on their specificity: while entrepreneurial and investment experience increase campaign success, general human capital shows no significant impact, and factors such as ambition and reputation may moderate these effects (Zhang et al. 2024). Collectively, these findings highlight the implicit scope of human capital shaping investment behaviour and influencing collective participation.

Value adding contribution beyond investment

Besides the potential effect on the success of fundraising, the impact of investors' human capital extends beyond the campaign itself. Considering a wider perspective, crowdfunding is a way to build non-financial capital in light of backer's apport to create new human, social and psychological capital in the venture (Macht and Chapman 2019). Additionally, the beneficial effect of investors' intellectual capital in the post-campaign life of ventures has been confirmed looking at performance measurements like sales and employment growth (Troise et al. 2020).

Sustainability orientation

Within the crowdfunding literature, this recent and rapidly expanding stream addresses the theme of sustainable projects as well as the types of supporters who invest in sustainability-oriented crowdfunding projects. Peer reviewed contributions explore the traits of sustainability projects backers, their behaviour (Tenner and Horisch, 2021; Hornuf, Stenzhorn and Vintis 2022) and the role of human values in explaining crowdlending decisions for sustainable ventures (Dihn and Wehner 2022).

Alongside profiling the backers, other works investigate the attractiveness of sustainability-oriented ventures in equity crowdfunding (Vismara, 2019) and the impact of venture's sustainability orientation on successful fundraising through equity crowdfunding (Calic and Mosakowski, 2016). More recently, the literature has explored whether funders' attention to environmental sustainability, evident in their design and implementation choices, may contribute to the campaign's success (Corsini, Appio and Frey, 2024). Additional contribution examines the influence of lead investors on campaign success and post-campaign performance comparing sustainable oriented ventures and non-sustainable oriented ones (Del Sarto and Bellavitis, 2025).

Gender

Among other entrepreneurial finance mechanisms, crowdfunding is acknowledged as the one having the higher gender diversity metric (Vismara, Benaroio and Carne 2017), representing a potential tool of democratization of financial markets. To date, literature has investigated gender dynamics on both demand and supply of crowdfunding phenomenon. The question that appears to open up the theme addresses the role of gender on investors' and entrepreneurs' decision-making, and, consequently, on the crowdfunding outcome. Other studies have investigated the presence of gender gap in equity-based crowdfunding, suggesting that the gender of venture directors has an impact on crowdfunding success (Prokop and Wang 2022). On the fund seekers side, gender impact is also analyzed in relation to the launch of equity crowdfunding offerings (Cumming, Meoli and Vismara 2021). Another perspective has examined which aspects drive female investments (Venturelli, Pedrazzoli and Gualandri 2019). Empirical analyses also point out similarity patterns and reveal that the ethnic and gender similarity between investors and entrepreneurs influences the amount invested in a campaign (Venturelli, Pedrazzoli and Gallo 2020). Moreover, the number of female investors in campaigns by female-led businesses is greater than that in male-led businesses (Vismara, Benaroio and Carne 2017). Recently Bonvino et al. (2025) identified some determinants that favor women's participation in equity crowdfunding campaigns. In particular, they found female investors are more likely to finance projects proposed by female entrepreneurs, few women contribute to finance the project when the minimum investment chip is larger, and they are relatively less represented in follow-on campaigns.

5. Future research directions

From a methodological standpoint, the literature on human capital within BAs and CIs research has predominantly relied on qualitative approaches, with semi-structured interviews and subsequent text analysis being a widely adopted strategy. These approaches are particularly suited for exploring the personal and often subjective dimensions of human capital, such as values, beliefs, and motivations. However, they also present challenges related to sample size, replicability, and generalizability. On the quantitative side, cross-sectional regression analyses are frequently used, often based on case studies from a single platform or country. The measurement of detailed human capital remains quite complicated, as many of its components are intangible and not consistently disclosed. To address these limitations, scholars increasingly call for the development of better data collection practices and the use of larger, more diverse samples. There is growing recognition that future research would benefit from the integration of qualitative insights and quantitative data, for example integrating survey responses with platform-level data.

5.1 BAs

Investment behaviour

Although BA investment behaviour has been an established area of research, it still offers opportunities for further research. To date, literature has pointed out rejected investments are mostly dependent upon venture characteristics rather than investors' ones. Previous studies have focused on BAs' conventional characteristics such as demographics, education, entrepreneurial and investment experience in opportunity evaluation and rejection criteria. Recent findings point to the growing relevance of less tangible factors, including psychological traits, social identity, and cognitive biases. Future research could investigate how these different dimensions influence BAs motivations and decisions to invest. Additionally, research indicates that shared HC characteristics between investors and entrepreneurs can increase the likelihood of investment amounts and influence valuations. Consequently, there is scope for deeper investigation on homophily and complementarity in angels' selection behaviour.

Value adding contribution

BAs' contribution to startup development considers the role performed by angels and the impact of their investment, presence, activities and characteristics. Current studies highlight that BAs fill knowledge gaps through provision of their own human capital and facilitate access to contacts. Overall, they use their expertise and networks to support ventures financially and strategically. Interestingly, BA's personal fame, implicit recognition as "lead investors" and previous track record strongly affect whether and how they facilitate access to follow-on capital (e.g. Venture Capital financing). Moreover, the type of professional experience is found to impact sales of funded ventures with diverse growth patterns. There is the scope for deeper empirical investigations into these mechanisms. The effects of reputation and professional fame, while generally positive, also call for examination of potential downsides such as misfit or overinvolvement. Moreover, the impact of HC fit on post-investment practices and venture performance, whether through similarity or complementarity with entrepreneurs' one, remains an important open question. Finally, greater attention is needed to understand different forms of post-investment involvement.

BA networks and groups

Business angels' groups and networks have been investigated by academic literature in light of the growing pull of such affiliations. Existing studies highlight differences between independent BAs and angel group members in terms of risk assessment and investment preferences. Moreover, it has been remarked that when angels join their forces, they achieve different contributions with respect to individual investment. In line with this evidence, there is a call to deepen the extent to which investor characteristics influence preferences made by groups. Moreover, future research has scope to explore how these group dynamics evolve through ongoing interactions, and whether less experienced angels effectively enhance their human capital by engaging with more seasoned peers. It would be interesting to adopt longitudinal approaches to better capture the nature of group investment processes, particularly focusing on how specific behaviors, roles and internal dynamics lead to better venture performance. Moreover, examining the interplay between personality, motivations, and active involvement in group governance could illuminate the viability and strategic direction of BA groups. Finally, it would be interesting to explore whether and how different association rules, membership and network management practices can affect the survival and performance of new ventures.

Green Investing

Future research on the intersection of human capital and green investments offers several underexplored avenues. Scholars could further investigate how business angels conceptualize and prioritize sustainability impact when screening green and clean tech ventures, including the extent to which they demand evidence of environmental outcomes (e.g. CO_2 emission reduction) to entrepreneurs, and how they evaluate and rank various types of impact. The individual characteristics and experiences that predispose angels toward impact-oriented investments also deserve greater attention. An additional line of inquiry concerns the role of business angel networks and reciprocal BA collaboration in facilitating or constraining green angels' activities. Longitudinal studies are particularly needed to capture how conventional angels evolve into green angels over time and how they acquire sustainability competences. Moreover, the ethical dimension involved in this transition (e.g., sense of responsibility, aligning investments with personal values) thus represents a relevant topic for future analysis. Furthermore, future research could explore the potential for structured educational opportunities (e.g. seminars), to help BAs build sustainability-specific knowledge and skills.

Gender dynamics

There is growing interest in gender dynamics within the business angel landscape, as several important gaps remain concerning this dimension of human capital shape investment behaviors and outcomes. While evidence suggests that women business angels are more inclined to invest in women-led ventures, this trend appears to stem more from personal networks or common entrepreneurial experiences than from pure gender preferences. However, given that female angels still represent a small and relatively recent share of the investor population, there is still scope for further research on the barriers limiting this participation. Future studies could explore the role of demographic and socio-economic factors (e.g. ethnicity, education, occupational history, and geographic location) in shaping both access to angel capital and investment decision-making processes. Additionally, the possibility that women entrepreneurs may adjust their funding requests based on the gender of the investor remains unexplored and deserves empirical attention. Investigating the extent to which male and female angels differ in the non-financial value they add to ventures also offers a promising line of inquiry.

5.2 CIs

Crowdinvestors' Investment behavior

As in the BAs Literature, even research in equity crowdfunding has increasingly recognized the role of investor human capital in shaping investment behavior. Existing studies emphasize the importance of lead investors' characteristics (like experience, ambition and reputation) in signaling venture quality and influencing campaign outcomes. However, the current use of binary indicators to capture investor experience limits deeper insight into the nuances of signaling. Future research could therefore adopt scaled or continuous measures to assess the quality rather than the mere presence of experience. Additionally, while affiliations with prior qualified investors are linked to campaign success, it remains unclear whether this is driven by a signaling effect or by other benefits related to qualified investors. Moreover, investor-side signals deserve greater attention: while we know that investors with more general or specific human capital process information differently, little is known about how they interpret complex signal sets or how signal formation links to investment outcomes. Methods such as eye-tracking and longitudinal designs could provide richer insight into these mechanisms and their impact over time. Finally, there is a need for finer-grained analysis of the influence of investor's trust, integrity and benevolence.

Value adding contribution

More recent analyses suggest that the contribution of crowd investors extends well beyond capital provision, emphasizing their potential to create value through the application and transfer of their human capital. For instance, backers' prior industry experience has been positively associated with key performance indicators such as sales growth (Troise et al. 2020). Additionally, participative behaviors during campaigns, such as providing feedback and posing questions, enable backers to share their expertise, which entrepreneurs can leverage to improve their strategies (Macht and Chapman 2019). These exchanges can also serve as opportunities for founders to develop their own human, social, and psychological capital. Consistently, there remains ample scope for further investigation into the broader impact of crowd investors on venture development, particularly regarding their contribution to post-campaign performance beyond equity financing. Future research might investigate backers' motivations to provide unsolicited comments, the utility of such input from the founders' perspective, and the role of different communication formats in facilitating human capital flows. Moreover, a closer look at how relational dynamics shape mutual learning between backers and entrepreneurs could enhance the understanding of the collaborative potential embedded in crowdfunding ecosystems.

Sustainability orientation

Recent evidence on sustainability themes in equity crowdfunding presents an evolving and sometimes contradictory picture. While some studies demonstrate that ventures' sustainability orientation can enhance funding outcomes, others find that it holds limited appeal for certain investor groups. These mixed results suggest that the human capital dimension requires deeper exploration, both in terms of how entrepreneurs communicate sustainability and how investors evaluate it and contribute. A promising avenue involves distinguishing how professional and non-professional investors interpret environmental and social value propositions embedded in entrepreneurial projects and how demographic traits, financial experience, or personal values influence their responsiveness to sustainability-oriented ventures. This approach, in turn, could allow further classification between the types of investors. There is also potential to examine how founders' human capital contributes to signaling the credibility and legitimacy of sustainability-oriented ventures. Furthermore, attention can be directed to the post-funding stage, particularly regarding the broader social and environmental performance of sustainable ventures. In order to advance beyond conventional financial metrics, it would be useful to incorporate impact-oriented measures. In addition to classic HC variables, future research could also take into account funders engagement metrics, such as social media interaction and online feedback through the platform.

Gender dynamics

Gender dynamics have been initially addressed within the equity crowdfunding literature, particularly in relation to how human capital interacts with gender to shape investor behavior and participation. While evidence shows that gender similarity between entrepreneurs and investors can foster engagement among female backers in women-led ventures, findings on campaign success remain mixed. Additionally, gender disparities appear more pronounced in seasoned offerings, suggesting the need for longitudinal analyses to unpack when and how these patterns emerge. Furthermore, while factors such as lower investment thresholds and mission alignment seem to attract women investors, constraints seem to limit their broader participation. Additional studies should investigate how gender intersects with other forms of human capital, such as education, experience, and risk preference, and explore whether these interactions vary across crowdfunding models. There is also scope to examine broader similarity patterns beyond gender and ethnicity, for instance on age, values, and psychological attributes, as well as their role in influencing matching dynamics, investment amounts, and post-campaign performance.

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