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Female access to finance: A survey of literature

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EIF Research and Market Analysis

Working Paper 2023/87

Female access to finance: a survey of literature

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Abstract [1]

This paper examines the current academic literature on access to finance for female entrepreneurs and female-led enterprises. It looks at studies covering two main financing markets: credit and venture capital (VC). The paper finds wide consensus about the existence of a *credit* gender gap in Europe, however, there is no general agreement on its exact root causes. Among the hypotheses put forward are female aversion to credit, gender discrimination as well as structural differences between male- and female-led firms, rendering the latter less likely to apply for and be granted credit. The current literature also overwhelmingly agrees about the presence of gender disparity in the European VC ecosystem. What is more, some studies argue that such disparity might be due to market frictions, e.g., due to VC investors being (un)intentionally biased against female entrepreneurs. While there might be multiple reasons leading to such gender imbalance, the consequence that some high-quality female-led projects fail or are never undertaken due to limited access to finance brings about large negative externalities for the European economy. Such type of market failures, both in the credit and VC markets, should motivate policymakers' intervention to improve access to finance for female-led enterprises.

This paper aims to provide a policy-oriented and introductory framework to the topic of female access to finance. It is neither a comprehensive, nor an exhaustive survey of this increasingly researched subject. Instead, it presents several leading hypotheses from the academic literature about the credit and VC gender gaps. It also collects some of the most prominent empirical findings about the gender imbalance in the European credit and VC markets over the last decade.

[1] This paper benefited from comments and inputs of many EIF colleagues, for which we are very grateful: Silvia Manca, Simone Signore, Antonia Botsari and Frank Lang.

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1 | Female access to credit

In this chapter, we discuss the theoretical framework on female access to credit, based on the current academic literature. We summarise the hypotheses put forward with respect to both the demand and supply side of credit as well as those relating to the structural differences between male- and female-led enterprises. These theoretical rationales find support in the empirical evidence presented in the second part of the chapter. Concluding remarks on female access to *credit* together with female access to *venture capital* are discussed in chapter 3 |.

1.1 | Theoretical framework

It is universally acknowledged that the availability of and access to finance plays a fundamental role in the establishment, development and survival of businesses. For small and medium-sized enterprises (SMEs), access to credit can play a key role, particularly in the early stages of growth. Therefore, failures in credit markets could prove detrimental to the development of young companies individually, however they could also lead to systemic issues in the overall economy. A potential deficiency in credit markets is females' unequal access to bank finance, especially given the significant proportion of female entrepreneurs (Elam et al., 2019). If women-led enterprises face greater challenges in accessing credit than men-led ones, this is an area of public policy concern and, hence, justification for its intervention.

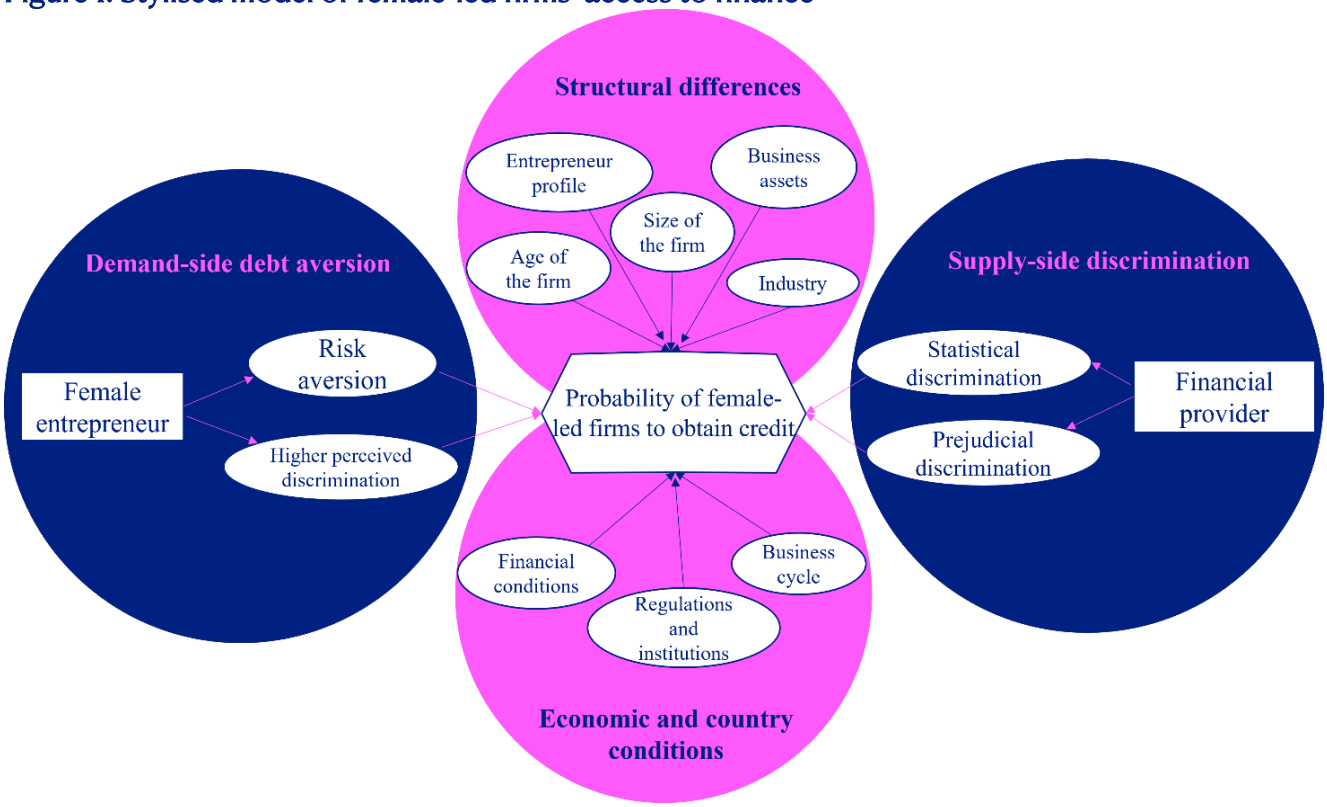
The goal of this literature review is to provide a summary of the current academic insights into female access to credit. Therefore, it is important to look at research using recent data and applying robust econometric techniques. In order to inform European public policy as well as provide up-to-date information regarding the recent developments in credit markets, the empirical evidence reviewed in section 1.2 focuses exclusively on European studies produced in and around the last decade. There is a rich and still growing body of literature discussing the credit gender gap, which, generally, revolves around three main pillars: (1) demand-side debt aversion, (2) supply-side discrimination and (3) structural differences between male- and female-led enterprises (or some combination of the three). In addition, economic and financial conditions also play a role in the probability of obtaining credit for females. Let us look at each rationale individually before presenting the supporting empirical evidence.

One of the main reasons behind demand-side debt aversion put forward in the literature is risk aversion (see Figure 1). Often, women are believed to be more risk averse and hence, show lower appetite for credit financing (Croson and Gneezy, 2009; Carter et al., 2015). Female entrepreneurs prefer to self-finance their business rather than rely on the banking channel (EIB, 2020). Another reason often circulating in academic research is that women perceive themselves (perhaps wrongly) as facing greater challenges and worse contractual terms in comparison to men (Cavalluzzo et al., 2002). As a result, women might self-select out of the credit market.

Supply-side discrimination can be further broken down into two types: prejudicial and statistical (Moro et al., 2017). Prejudicial type of discrimination is taste-based and can be defined as lack of adherence to objective criteria in formulating judgments on individuals (Becker, 1971). On the other hand, statistical discrimination arises in the presence of imperfect information, where data on important indicators, such as creditworthiness, are difficult and costly to obtain directly. In this case, any evaluation will be dependent on the prejudices of the loan officer (however, they may not necessarily be motivated by antagonism towards the female gender). While statistical discrimination could be the consequence of profit-maximisation (Muravyev et al., 2009), prejudicial discrimination could even result in forgoing potentially profitable market transactions (Becker, 1971).

Finally, the difference in the bank financing rates between male and female-led businesses could be explained by their structural differences, thus unrelated to instances of discrimination and/or aversion. For instance, different firm characteristics, such as size and industry of activity; entrepreneurial profile characteristics, such as education, business management experience or assets, such as collateral and personal guarantees could affect the demand for and granting of credit (Presbitero et al., 2014). Figure 1 below presents a stylised framework of the various factors, which play a role in the probability for female entrepreneurs to obtain credit.

Figure 1: Stylised model of female-led firms' access to finance



Source: Authors (based on literature discussed herein)

1.2 | Empirical evidence

Due to data confidentiality and related limitations, the available empirical evidence on the credit gender gap predominantly relies on survey-based data. In turn, this bears the potential downside of results being driven by the self-perception bias, as hypothesised in Cavalluzzo et al. (2002). However, the relatively fewer studies employing transactional data provide overwhelming support for the conclusions drawn by survey-based research.

1.2.1 | Evidence from survey data

A number of publications on the topic of gender access to credit exploit ECB's SAFE[2] data on euro area countries (Stefani and Vacca, 2013; Moro et al., 2017; Galli et al, 2020). In conjunction with de Andrés et al.'s (2021) results, this stream of research confirms the presence of a credit gender gap. In contrast to de Andrés et al. (2021), however, the studies do not find the cause of the gap to be gender discrimination, but rather female debt aversion or structural differences between male- and female-led firms. For instance, Stefani and Vacca (2013), find that female-led firms face difficulties accessing credit both on the demand side since the anticipation of a rejection makes them apply for bank loans less frequently as well as on the supply side as they do indeed experience a higher rejection rate. However, the authors note that these different patterns are largely explained by the firm characteristics making female-led firms structurally different from those led by men. Significant differences in the loan application rates of female-led firms as opposed to male-led counterparts after controlling for firm features are also found by Moro et al. (2017) and Galli et al. (2020). Both studies suggest that women are more likely to self-restrain from applying for bank loans because of fear of rejection.

Another strand of literature employs the survey-based BEEPS[3] data, which provide information on 34 countries, including post-socialist economies of Eastern Europe (Muravyev et al, 2009; Drakos and Giannakopoulos, 2011; Aristei and Gallo, 2016; Ongena and Popov, 2016). The results are rather consistent and all provide evidence of female credit rationing. In addition to a mild credit gender gap, Muravyev et al. (2009) also note that, in the years 2004 and 2005, female entrepreneurs were charged about 0.45 percentage points higher interest rates when loan applications were approved.[4] The authors find that the likelihood of female entrepreneurs receiving a bank loan was higher and the size of required collateral was lower in more financially developed countries. As such, their analysis backs Becker's theory: higher financial development, by intensifying competition among financial providers, reduces taste-based discrimination.

Aristei and Gallo (2016) explain the credit gender gap with both female debt aversion and supply-side discrimination. Female-led firms are discovered to have lower credit demand while still being more likely to be financially constrained than their male counterparts. Furthermore,

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[2] Survey on the access to finance of enterprises, conducted by the ECB.

[3] Business Environment and Enterprise Performance Survey, conducted by the EBRD in partnership with the World Bank.

[4] Note that over the 18 years since the findings in Muravyev et al. (2009), market conditions might have significantly shifted.

women-led firms are found to have a significantly higher probability of credit rejection, unexplained by differences in the observed characteristics. However, the authors concede that banks may have more information justifying the gender differentials in credit granting rates. Drakos and Giannakopoulos (2011) also find weakly significant evidence that female owners have close to three percentage points higher probability of being credit rationed. The authors, however, cannot pinpoint whether the reason behind the rationing is demand- or supply-driven.

Ongena and Popov (2016) combine the BEEPS data with an exogenous measure of gender bias. The authors find that in high-gender-bias countries,[5] female entrepreneurs are more likely to opt out of the loan application process and to resort to informal finance. Interestingly, however, and contrary to Aristei and Gallo (2016), there is no evidence that banks actively discriminate against them. The authors also find no differences in the terms of granted loans, such as interest rates, collateral requirements, and the negotiation time involved.

Using the UK Household Survey of Entrepreneurship, Sena et al. (2012) confirm that females are discouraged to seek external finance for business start-ups since they perceive stronger financial barriers to starting a business than males. The authors find no evidence, however, that once women do seek finance they are any less likely to obtain it than men. Using different survey data, but reaching similar conclusions, Kwong et al. (2012) find that women in the UK are around 10% more likely than men to perceive finance to be the only barrier to entrepreneurship. The study suggests that such perceptual problems can negatively affect business aspiration as well as actual participation. A more recent study using World Bank survey data concludes that female entrepreneurs are more discouraged than their male peers, however, this discouragement can be avoided if legislation incorporates an anti-discrimination clause regarding access to credit (Bertrand and Perrin, 2022). Yet, in the context of Sweden, Isaksson and Quoreshi (2015) find, on the contrary, that female entrepreneurs are more likely to use external financing when starting their own business.

Interestingly, the financial and economic circumstances seem to be able to reverse the sign of the results. Some recent evidence from Cowling et al. (2020) shows that female credit applications in the UK were more likely to be successful than male ones in the aftermath of the global financial crisis. This result is explained by feminised risk aversion, which might inform more conservative applications during a period of financial uncertainty. However, the authors still uncover some *"subtle evidence that a pound of collateral offered by a female loan applicant is treated less favourably than a pound of collateral offered by a male applicant"*.[6] Therefore, in the context of high uncertainty, femininity may be advantageous as financial institutions seek to hedge their risk by favouring more conservative borrowers. This finding has also been validated during the COVID-19 crisis across a number of different countries (Wellalage et al., 2021). The authors provide evidence that creditors favoured female entrepreneurs when dealing with cash flow problems during the pandemic.

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[5] High-gender-bias countries are classified as the top 50% based on survey responses about "the proper place of women in society": Bosnia, Croatia, Hungary, Macedonia, Montenegro, Poland, Romania, Serbia, Slovenia and Spain.

[6] Specifically, the authors find a significantly negative interaction between women and security provision on approval rates. By contrast, female-led businesses with higher cash balance were more likely to be approved. The authors conclude that lenders tend to assign different values to alternative forms of collateral provided by women, and potentially because of gender discrimination.

1.2.2 | Evidence from transactional data

One of the most recent works in this field examines the Spanish credit market and finds that females are between 10 and 25% less likely to apply for a loan and have a 10% lower probability of obtaining credit in the founding year than their male peers in the same industry (de Andrés et al., 2021). However, the authors note that the credit access gap disappears from the second year onwards, which rules out the above mentioned Beckerian taste-based discrimination. What is more, the results show that women-led companies who experienced tougher credit access in the founding year were, in fact, less likely to go into default, which excludes statistical discrimination as well. Instead, the authors suggest the possibility of a non-rational double standards bias, which might be a consequence of implicit (unconscious) discrimination.

Using a unique Italian data set on overdraft contracts between banks and microenterprises and self-employed individuals, Alesina et al. (2013) present robust evidence that women in Italy, even though not identified as riskier borrowers, pay more for overdraft facilities than men after controlling for a large number of characteristics relating to the type of business and owner.

Bellucci et al. (2010) also look at the Italian market and show that female entrepreneurs face tighter access to credit since the probability that they need to pledge collateral is six percent higher than the one of male business owners, even though the interest rates paid do not differ by gender. This finding is consistent with the taste-based discrimination theory since the discrimination effect is independent of the information available about the borrower. Interestingly, the authors also find that female officers are more risk-averse or less self-confident than male officers as they tend to restrict credit availability to new, unestablished borrowers more than their male counterparts.

Another examination of loan officers' gender using unique Albanian data by Beck et al. (2018) documents that first-time borrowers assigned to officers of the opposite sex are less likely to return for a second loan, especially when officers have little prior exposure to borrowers of the other gender and when they have more discretion to act on their gender beliefs. Furthermore, first-time borrowers matched with opposite-sex loan officers are found to pay higher interest rates and receive smaller and shorter-maturity loans, but do not experience higher arrears.

2 | Female access to venture capital

In this chapter, we discuss the theoretical framework and empirical evidence regarding female access to venture capital (VC) based on the current academic literature. Among the factors related to prejudice against female entrepreneurs, we find homophily and the gender-role congruity theory. The presented theoretical rationales are also supported by empirical examples presented in the second part of the chapter. Concluding remarks on female access to *VC* together with female access to *credit* are discussed in chapter 3 |.

2.1 | Theoretical framework

Entrepreneurship is among the most crucial features of a thriving economy and one of the largest contributors to economic success. Especially young and innovative companies play a central role in employment creation, innovation advancement and productivity growth. From a policy perspective, it is important to study the entrepreneurial process and its various aspects to ensure it can operate optimally. One of the most important stages in entrepreneurship concerns obtaining initial capital to launch a business idea off the ground. Against this backdrop, VC is a crucial financing source for new ideas and technologies (Kaplan and Lerner, 2010).

One concern that has been well documented and acknowledged is the gender disparity in the access to external equity financing (Gompers and Wang, 2017). Even though the VC industry has experienced record growth in 2020 (Crisanti et. al, 2021), female entrepreneurs seem to have been left out of this process. Companies founded solely by women garnered just 2.4% of total VC invested in European start-ups (Pitchbook, 2021), although women make up close to 40%[7] of all European entrepreneurs (EIB, 2020). Policymakers should, therefore, address this disparity and increase female representation in the VC industry to help boosting the number of commercialised female ideas. This chapter looks at the theoretical rationales behind the VC gender gap, studies the current empirical research and in conclusion provides some policy recommendations.

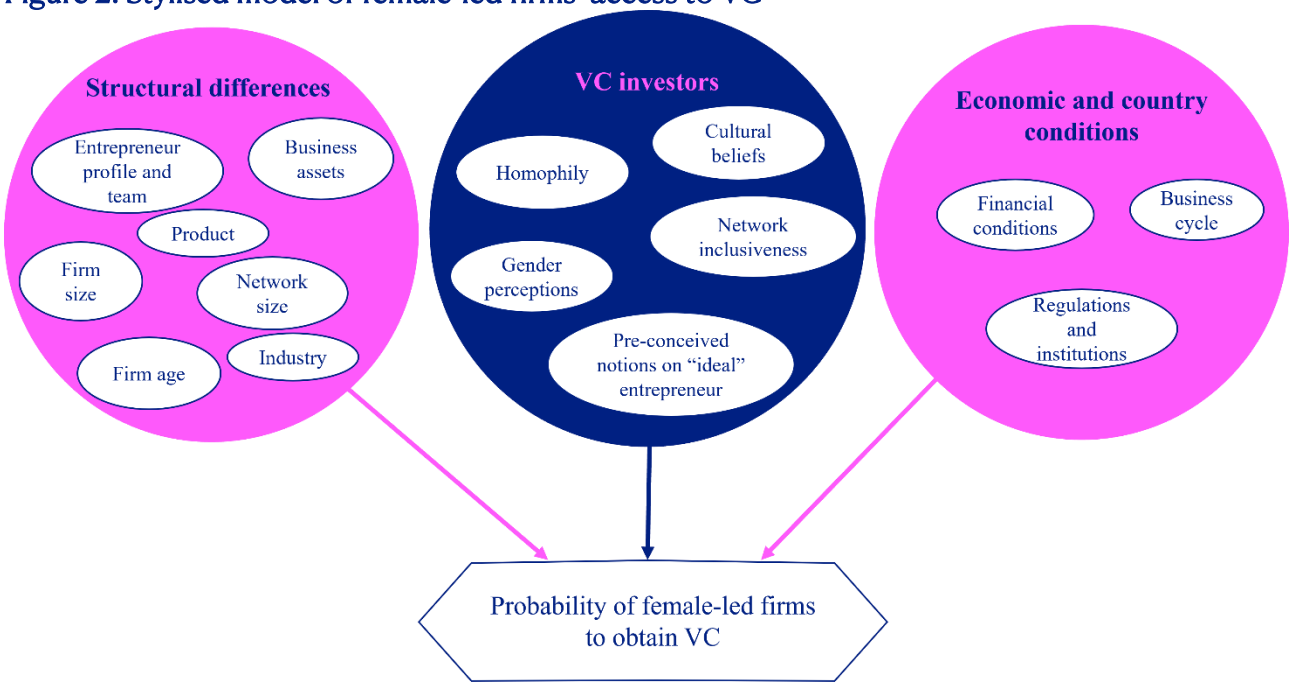
Past academic efforts offer a collection of intertwining theories aimed at explaining the VC funding gender gap. In addition to general economic and country conditions, gender related

[7] We should note that not all start-ups are suited for VC financing, which is typically only relevant for enterprises with a high-growth potential. Therefore, this statistic should be considered an upper bound of the total share of female-led companies, which might seek VC. To our knowledge, gender statistics on high-growth enterprises are not currently available for Europe.

structural differences and perceptions also play a role in the probability of obtaining equity for females. Figure 2 attempts to summarise these in a stylised framework.

Among the most often cited reasons why VC investors might be biased against women is homophily – the tendency of individuals to associate with others based on shared characteristics (McPherson et al. 2001). Gender can act as a common driver for homophily. As such, female entrepreneurs may face a twofold challenge to obtain funding for their ventures: on the one hand, they tend to be underrepresented in traditional funding networks. On the other, male investors will tend to associate themselves more with male entrepreneurs (Greenberg and Mollick, 2017).

Figure 2: Stylised model of female-led firms' access to VC



Source: Authors (based on the literature discussed herein)

Since entrepreneurial networks are also characterised by a high degree of homophily (McPherson et al. 2001), they can influence the various stages of the entrepreneurship process and affect the transfer of knowledge (Neumeyer et al., 2019). Heavy reliance on trusted referrals may privilege those who are more connected to investors (Cohen et al., 2008). Since over 90% of VC investors are men (Gompers and Wang, 2017), homophily in networking could disproportionately impact women if entrepreneurs do not get a chance to interact as much with VC investors of their own gender. Howell and Nanda (2019) suggest that networking frictions are an important reason why men benefit more than women from exposure to VC. Females may be experiencing social network barriers in which they simply lie outside of the VC industry's network (Brush et al., 2009).

Another important perspective relates to the gender-role congruity theory. In a nutshell, the theory suggests that the perceived incongruity between the traditional female gender role and an occupational role that is traditionally and "ideally" masculine, e.g., manager or leader, leads to less favourable views of women in such roles (Eagly and Karau, 2002). Entrepreneurship is often

perceived as a male-typed activity (Cavalluzzo et al., 2002) and cultural beliefs about masculine characteristics can be especially strong for high growth ventures (Thébaud, 2015). Due to their "atypicality" in the entrepreneurship setting, therefore, women tend to be perceived as less competent or less "natural" entrepreneurs (Kacperczyk and Younkin, 2019). This theory is very much related to Brush et al.'s (2004) findings that investors perceive female entrepreneurs (perhaps unconsciously) as lacking important entrepreneurial attributes such as leadership, risk-taking propensity, experience, endurance, financial savvy, and the ability to change.

Malmström et al. (2020) argue that the perceived congruity of "male", "masculine" and "entrepreneur" implies a natural "fit" that gives men a significant advantage over women when they are evaluated as entrepreneurs. This suggests that resource holders will discount female entrepreneurs and the investment-worthiness of their enterprises. Since the role of entrepreneur has been associated with masculinity, there may be a roadblock for women to be considered as successful entrepreneurs, often even by women entrepreneurs themselves (Gupta et al., 2009). However, interestingly, Balachandra et al. (2020) notes that VCs do not seem biased against women based exclusively on their gender when pitching, rather they are found to be biased against displays of femininity, which may be more typical for women to demonstrate.

Lastly, the VC gender gap may also be (partly) explained by structural differences between male- and female-founded start-ups. The entrepreneurship literature confirms that ventures that focus on the needs/markets that are traditionally associated with men are more likely to be started by men, and vice versa – women are more likely to start ventures focused on the needs/markets that are traditionally associated with women (Ardichvili et al., 2003). In addition, the research hints at the existence of a "self-stereotyping" process (Ashforth and Mael, 1989), in which entrepreneurs tend to self-select into industries that are consistent with the stereotypical perceptions of their gender group. If women gravitate toward "feminine" industries (retail, fashion, cosmetics) and men toward "masculine" industries (high-tech, manufacturing, construction), this could explain why women receive less funding on average – they target comparatively less "lucrative" sectors and have lower funding needs (Thébaud, 2015).

If (male) VC investors are not interested in and/or less familiar with female-oriented markets, they may associate ventures in this domain with lower growth potential and performance expectations (Tyebjee and Bruno, 1984). In other words, (male) investors' perceptions about the qualities that make a market attractive may themselves be gendered. Furthermore, the invitation to pitch is often based purely on the company's market and industry. Therefore, many female entrepreneurs in certain sectors may face upfront exclusion from the opportunity to pitch for VC funding and, as a result, fail to obtain the necessary capital to develop and scale their ventures (Alsos et al., 2006).

2.2 | Empirical evidence

While the topic of gender differences in VC has been getting a lot of academic attention recently, a large share of it has focused on the US market (Guzman and Kazperczyk, 2019; Neumeyer et al., 2019; Howell and Nanda, 2019; Kwapisz and Hechavarría, 2018; Brush et al.,

2018; Lin, 2016; Gornall and Strebulaev, 2020). Nevertheless, there is also a significant number of scholarly contributions looking at European data. Since the cultural and institutional contexts are highly important (Brown et al., 2011; Moro et al, 2017), in order to inform European public policy, we will only review recent and robust research results applicable to Europe's VC ecosystem.

One practical matter related to the definitions of (fe)male-led and mixed-gender teams is worth discussing upfront. Human capital data about entrepreneurs are typically limited and difficult to obtain, therefore studies often use different definitions. Most often, researchers look at the founders to ascertain the team's gender diversity and at the CEO to determine if the team is (fe)male-led. The definition for founder, however, can still differ – some analyses are quite unambiguous, such as Hellmann et. al (2019)[8] while others do not clarify what they mean by "founders", e.g., Cassion et al. (2021) and Raina (2019).

2.2.1 | Venture capital investments

Two current and comprehensive pieces of research look at VC-backed start-ups based across Europe and the US (Cassion et al., 2021; Schillo and Ebrahimi, 2021). Cassion et al. (2021) find that companies with a male CEO have much better funding outcomes than those with a female CEO. By constructing several machine-learning models to predict fundraising success, the authors find that, surprisingly, the CEO's gender emerges as the most important founder characteristic, surpassing crucial features such as top university attendance as well as the number of prior exits. Interestingly, however, mixed-gender male-led start-ups achieve the best funding results, leading the authors to conclude that VC investors embrace gender diversity, but not female CEOs. Schillo and Ebrahimi (2021) also find that women's participation remains low and continues to have a negative relationship with VC funding. The authors express their concern that despite the recent digitalisation of economic activities and the expectations that this has led to greater opportunities for women, their findings show otherwise.

Kanze et al. (2018) and Viashima and Samila (2020) exploit data from "TechCrunch Disrupt", a prominent international start-up competition.[9] Kanze et al. (2018) find that male entrepreneurs are asked mainly promotion questions, i.e., focusing on hopes, accomplishments and advancement needs, whereas female entrepreneurs are asked more prevention questions, i.e., focusing on safety, responsibility and security needs. These acute differences in investor questions and subsequent entrepreneur responses result in divergent funding outcomes, whereby entrepreneurs asked promotion-focused questions raise significantly higher amounts of funding.

Viashima and Samila (2020) study the way investors approach male versus female entrepreneurs. However, variation is detected only in the behaviour of female financiers. Female VC investors are found to be significantly more interested in entrepreneur and team criteria when evaluating

[8] Holders of management roles and an equity stake that exceeds 5% while non-executive directors, entrepreneurs with advisory roles, and entrepreneurs with a small equity stake are not counted.

[9] TechCrunch Disrupt is among "the most prestigious settings in which high-tech start-ups can launch" – Kanze et al. (2018).

female-led ventures compared to male-led ones. Furthermore, female investors are found to appear more focused on the upsides of both product and entrepreneur / team dimensions when screening female entrepreneurs, suggesting a more favourable view for the latter. Interestingly, the authors find no significant variation in the screening criteria of male investors vis-à-vis gender.

A prominent strand of literature explores Swedish governmental VC investors (see Box 1 for additional details). This series of studies exposes gender biases in governmental VC financing even though the political agenda specifically supports female entrepreneurs' access to finance. This work further warns that such biases may be costly and restrict effective and rational decision-making in the distribution of VC funding. For instance, Malmström et al. (2018) show that stereotypical gender notions, e.g., that women are more risk-averse or that they lead underperforming enterprises, have no substance based on actual data on venturing performance.

By contrast, using global data sourced from Crunchbase, Raina (2021) estimates that male-led start-ups outperform female-led ones. However, the 24% performance gap fully disappears when female general partners (GPs) are present in the financing syndicate of start-ups. Therefore, the differing abilities of VCs to evaluate female-led companies are found to significantly drive the performance gap.

In addition to Raina's (2021) finding that the gender performance gap disappears when start-ups are financed by syndicates led by VC funds with female GPs, other research also shows that the gender gap could be moderated by certain characteristics. For instance, in a thorough investigation combining survey data of French entrepreneurs and corporate tax filings, Herbert (2018) finds that female-founded start-ups are 18% less likely to raise external equity, including venture capital. However, the gender funding gap *reverses* in female-dominated sectors.

Box 1: Additional regional evidence from the Nordic VC ecosystem

A thorough framework of stereotyping by Malmström et al. (2017) shows that when assessing the entrepreneurial potential, the entrepreneurs' attributes that are evaluated vary based on gender stereotypes, with women's potential undermined, but men's potential underpinned. The results support the view that investors employ different evaluation criteria for female and male applicants, to women's disadvantage. Combining qualitative and empirical work, Malmström et al. (2018) find that these biases are not empirically justified.

Most recently, Malmström et al. (2020) discover that women who signal an entrepreneurial attitude are more likely to elicit prevention considerations from venture capitalists, much in agreement to Kanze et al. (2018). At the same time, the authors find that men who signal such an attitude are more likely to elicit promotion considerations, which increase the amount of financing (whereas prevention considerations have the opposite effect).

Box 1 continued:

Alsos and Ljunggren (2017) apply signalling theory on investment decisions made by a small Norwegian investment fund. The authors identify three ways in which signals between entrepreneurs and investors are gender-embedded. The first two relate to different signalling due to inherent differences in financial, human and social capital between genders as well as the different types of industries men and women choose to enter. The last one, however, is related to how the stereotypical ascriptions of women and men influence interpretations of signals. The authors point out that entrepreneurship remains a masculine domain and thus women must communicate their legitimacy more strongly to overcome the inherent gender bias in the interpretation of signals.

When it comes to venture performance, Herbert (2018) also finds that female-led start-ups in male-dominated sectors hire more employees, sell more abroad and are more likely to exit by IPO than both male-led start-ups in male-dominated sectors and female-led start-ups in female-dominated sectors. The same holds true for male entrepreneurs in female-dominated sectors. The author suggests that the better performance of the minority group in gender-incongruent sectors implies higher requirements for funding of entrepreneurs who are minority (hence, a selection bias). Herbert (2018) warns that these data patterns are consistent with investors who have stereotypes.

Another VC gender gap modifier is detected by Lins and Lutz (2016) who study the VC market in Germany. Perhaps counterintuitively, the gender gap is found to be particularly large in the case of entrepreneurs with university degrees and entrepreneurial projects with high R&D activity. The authors theorise that, on the one hand, male entrepreneurs might be better able to use their time of study to build skills and networks that subsequently help them in their entrepreneurial projects. On the other hand, they also suggest that venture capitalists might subconsciously discriminate against women by valuing their university degree less than those of men.

The current economic and financial conditions might also play a role in investors' funding decisions. Concerns have been raised that the recent COVID-19 crisis has disproportionately affected women versus men in multiple economic contexts, such as unemployment and poverty risk (e.g., Profeta et al., 2021; Zarra and Ceron, 2021). Interestingly, the academic evidence on access to finance does not uncover such a trend. As mentioned in the previous chapter, Wellalage et al. (2021) have detected a slight gender bias *favouring* females in credit financing during the COVID-19 crisis but no evidence of gender bias in equity financing.

2.2.2 | Investments through crowdfunding platforms

One alternative to the VC funding channel are crowdfunding platforms. Although crowdfunding sites are believed to be a sub-par setting for understanding gender bias among investors (Ewens and Townsend, 2020), it is interesting to see whether the gender differences persist in this context as well. A study based on one of the leading international crowdfunding markets, Kickstarter, by Gafni et al. (2020) documents that the share of female entrepreneurs in the platform was 34.7%, which is quite close to the overall share of European female entrepreneurs. However, women were still found to be concentrated in stereotyped sectors, both as entrepreneurs and as backers. The overall results of this research are quite positive - women do

not set lower funding goals than men and enjoy higher rates of success. Nevertheless, both male and female backers showed a tendency to fund entrepreneurs of their own gender.

Hellman et al. (2019) study a British crowdfunding platform and, contrary to Gafni et al.'s (2020) results, find that the share of females in the team is associated with lower fundraising goals and lower valuations. Even though gender is not found to have a significant effect on the campaign success, the amount of money raised is significantly lower for female teams. Even after accounting for their lower investment goals and lower valuations, all-female and mixed-gender teams still raise less money. A meta-analysis by Geiger (2020) focusing on gender differences also finds that female entrepreneurs need less funding, however the author notes that this is fully explained by the business size and industry and ultimately results in greater funding success.

Further recent evidence from UK crowdfunding platforms is offered by Kleinert and Mochkabadi (2021) who show that investors respond differently to signals from male and female entrepreneurs. Their results show that female entrepreneurs are less likely to be positively evaluated if they send signals incongruent with their stereotypical gender role, for example management experience. On the other hand, the authors find that the signal of media coverage (an indication of trustworthiness) is more beneficial for female than for male entrepreneurs.

Finally, using data from a Swedish equity crowdfunding platform, Mohammadi and Shafi (2017) find that female investors are less likely to invest in the equity of firms that are younger, high tech and have a higher percentage of equity offerings. This pattern seems consistent with a greater risk aversion in female versus male investors. Furthermore, interestingly, female investors are found more likely to invest in projects with a higher proportion of male investors.

2.2.3 | Supply-side gender imbalance

Generally, the research vein exploring gender differences and biases in the context of VC investors – as opposed to entrepreneurs – is rather limited. To our knowledge, the only European evidence is descriptive – e.g., Kraemer-Eis et al. (2022) find that the average female representation in the investment team of the surveyed VC firms is just 15%. There is, however, some inferential work pertaining to the US market. For instance, in addition to both Blum (2015) and Calder-Wang et al. (2021) documenting gender disparity within VC firms, Calder-Wang and Gompers (2021) show that investments by female VC investors have significantly lower success rates. However, this is shown to have nothing to do with female investors' skills but is attributable to the lower amount of advice and input they receive from their colleagues as opposed to the support received by male investors. Finally, Gompers et al. (2021) show that improved gender diversity improves deal and fund performances.

A common path for successful female entrepreneurs is to become angel or VC investors themselves, thereby promoting the launch, development, and growth of additional women-owned firms (Coleman and Robb, 2020). Growth-oriented entrepreneurs need the example, encouragement, and support of other similar growth-oriented entrepreneurs in order to succeed. The creation of such virtuous cycle where established female start-uppers advance nascent female entrepreneurs will multiply both the number of female VC investors and female business owners (Coleman and Robb, 2020).

3 | Conclusions and recommendations

The current literature suggests that female entrepreneurs may face larger difficulties accessing finance in comparison to their male peers. Our review finds wide consensus in the academic field about the existence of both a *credit* and *venture capital* gender gap. However, the reasons behind these gaps can vary based on the financial instrument as well as multiple other factors.

It should come as no surprise that past academic work has provided mixed results on the sources of credit constraints for female entrepreneurs. Whether females face those constraints when attempting to finance their entrepreneurial endeavours clearly depends on a number of factors and conditions (Li et al., 2023). For one, the country-, institution- and regulatory-specific contexts play an important role (Brown et al., 2011; Moro et al., 2017). In addition, the dynamic financial and economic climate conditions matter significantly as shown in Cowling et al. (2019) and Wellalage et al. (2021). Finally, a critical consideration relates to the wide range of indicators used in empirical analyses to define the firm's gender structure (Presbitero et al., 2014). Differences in measures and data quality provide yet another explanation for the observed variation in results, making it difficult to compare findings and draw definitive conclusions.

Irrespective of its exact roots, the problem of female access to credit has been well defined in the literature. Although academic research is diverse as regards the specific causes of the credit gender gap, there is wide consensus about its existence. The gender differences in obtaining bank finance constitute a rather strong form of market weakness. Therefore, the issue of female access to credit requires public action and should be given the necessary attention by policymakers. To address the issue from the demand side, a combination of measures is required in order to dissipate women's perception of stronger financial barriers and expectations of unjust rejection. Females may benefit from programmes that encourage them to apply for bank finance, bring more clarity about credit eligibility and conditions, targeted campaigns or stimulated through specifically designed female credit programs. From the supply side, specifically targeted to women programs could also provide a solution since loan officers will not have the opportunity to gender discriminate in the presence of bank loan rationing. Anti-discriminatory policies might also prove useful. Finally, fostering competition in the banking sector can contribute to the reduction of inefficient discrimination against entrepreneurs based on gender.

The academic evidence is also in agreement regarding the gender disparity in the European VC ecosystem. What is more, a large body of research argues that venture capitalists show prejudice against female entrepreneurs (Li et al., 2023). Despite the potential inherent differences in entrepreneurial approaches, sectors of operation or human capital between men and women, the prevalence of negative stereotypes and gendered expectations held by investors seems to additionally widen gender disparities, putting women at a further disadvantage (Guzman and Kazperczyk, 2019). Irrespective of the gender gap's specific cause(s), these findings should prompt a serious public policy debate.

3.1 | Beyond gaps: the negative externalities of rationing by gender

Often, entrepreneurial access to external equity funding will be the determining factor between success and failure since VC investors, on top of funding, also provide start-uppers with valuable advice and other intangible benefits (e.g., Pavlova and Signore, 2021; Puri and Zarutskie, 2012). Therefore, female entrepreneurs' limited access to VC financing implies that some high-quality female-led projects fail or are never undertaken, leading to large negative externalities. On the one hand, this gender disparity means that some VCs are foregoing potentially better performance and, in turn, employing sub-optimally the resources invested by their limited partners (Gompers and Lerner, 1998). On the other hand, failing to fund female-led start-ups may result in missed job creation and growth in the economy (Haltiwanger et al., 2013).

The VC gender gap has, therefore, important implications for both the VC industry and the economy as a whole and should motivate policymakers' intervention. The latter, together with VC firms and companies, need to be proactive in designing inclusive strategies to capture the benefits from a gender-diverse workforce, all the while targeting the underlying gender gap causes. Firstly, the long-standing bias against female business leaders could be addressed by the formation of venture capital firms and fund-of-funds with the objective to invest more in gender-diverse companies (Cassion et al., 2021) or indirectly, by supporting gender diverse VC investors. Such type of affirmative action activities could also address the second source of gender disparity: the belief that certain female industries have a lower growth potential. These assumptions should dissipate with the emergence of successful start-ups in female-oriented markets.

Moreover, the more women gravitate towards high-tech (or manufacturing and construction) industries, the more the stereotypical perception of "masculine" industries would be challenged. According to a recent McKinsey report, women participation in tech can be increased by supporting girls in STEM classes earlier in their educational process and later by hiring and reskilling women into tech roles and improving their retention rates. This might not only address the gender gap in tech but would also address the overall tech talent gap in Europe (Blumberg et al., 2023). In addition to attracting more young women to STEM classes, policies to incentivise women's entrepreneurial appetite should be introduced (KfW, 2022).

Thirdly, homophily and gender networking frictions could be tackled by facilitating the access of women-led start-ups to the right coaching and investment networks. Public policy has a role in improving networking opportunities to encourage the financing of the best ideas overall – rather than just the better networked ones (Kraemer-Eis et al., 2021; Howell and Nanda, 2019). Tinkler et al. (2015) confirm that venture capitalists are less likely to discount female founders when uncertainty decreases due to endorsements provided by entrepreneurs' network ties.

Finally, if gender disparities arise at different stages of the entrepreneurial process and accumulate over time, policies should involve numerous interventions targeting the market failures when they occur (Guzman and Kazperczyk, 2019). Since investors' beliefs affect the development of young firms, besides promoting female entrepreneurship, a complementary

strategy to increase female participation as VC partners is also necessary. Given that female investors' evaluation of female entrepreneurs' projects tends to be better informed than that of their male colleagues, such a strategy may improve not only women's participation in entrepreneurship, but also their success (Raina, 2021). Viashima and Samila (2020) confirm that increasing the representation of women in venture capital investing would have positive effects on funding outcomes for female entrepreneurs. A higher number of females involved in the VC decision-making process would help address simultaneously all factors contributing to the gender disparity in the industry: homophily considerations and networking limits, the fact that entrepreneurship is considered a "masculine" occupation and, finally, notions that female-oriented products and ideas do not constitute "lucrative" VC investments.

Supporting female entrepreneurs both via equity and debt instruments also means indirectly supporting social and environmental projects. Women entrepreneurs proved to have the potential to make significant contributions to addressing social problems and creating positive social change. According to GEM (2022), women entrepreneurs represent some of most innovative, high-growth entrepreneurs and women-led start-ups tend to be socially oriented and focused on social value creation. Women-owned businesses are also more likely to engage in environmentally friendly practices, such as energy efficiency and recycling, and to support activities in education and health care. For example, Braun (2010), utilising a survey on environmental attitudes, finds that women had stronger commitment to the green entrepreneurship programs than males.

While addressing the gender credit gap might boost production of social goods, addressing the gender equity gap can boost climate, environmental and social innovations, as more gender diverse companies tend to incorporate sustainability into their innovation efforts. BloombergNEF (2020) finds that the presence of a critical mass of women on the board is correlated with climate and innovation performance.

3.2 | Overview of the EIF's initiatives in support of inclusive entrepreneurship

Historically, EIF's mandate portfolio did not include ad-hoc programmes focusing exclusively on gender. However, under the Social Impact Programmes, there are a number of examples of fostering *inclusive entrepreneurship* where the EIF tried to push forward industry frontiers.

For instance, under the European Commission's Programme for Employment and Social Innovation (EaSI) Guarantee, the objective was to increase access and availability of finance for micro-entrepreneurs, including entrepreneurs coming from vulnerable background or are at the risk of social exclusion and foster social entrepreneurship. In this respect women have been supported as micro and/or social entrepreneurs as well they may represent the target of a

specific business intervention enterprises put forward[10]. Similarly, this approach was pursued under other guarantee schemes, under the previous EU Multiannual Financial Framework (2014-2020). Such effort continues under the InvestEU Fund, for which EIF and EIB are the main implementing partners of the European Commission[11].

In its equity business, EIF – through all its InvestEU equity products – fosters a better gender diversification in the composition of investment fund management teams (including VC funds), with a focus on leadership positions, helping indirectly female entrepreneurship as female inclusion propagates downstream. More specifically, thanks to InvestEU, EIF aims to support women-led teams and/or gender diverse teams that are serving any of the InvestEU policy thematics and are at the same time complying with EIF's gender smart criteria (see more in Box 2). InvestEU will also benefit from a set of complementary advisory and capacity building activities.

Box 2: EIF's *gender smart strategy*

As part of its efforts to pave the way to a comprehensive EIF gender smart strategy, the EIF launched in December 2022 "Empowering Equity", a multi-dimensional event targeted towards diverse and women-led funds. The initiative was aimed at (i) detailing EIF's processes when assessing a fund proposal, (ii) fostering networking amongst first time team and more experienced and mature teams, (iii) creating a free and vibrant platform for exchanges of ideas and promotion of role models. Beyond InvestEU, the EIF is adopting a holistic approach towards the topic, focussing on the following dimensions:

- Reinforcing of ESG assessment of the financial intermediaries, with questions related to existence and applicability of diversity and inclusion policies;
- Assessment of component related to the diversity and gender-related topic when applying EIF's Public Policy Goal (PPG) model to mandates;
- Stronger partnership with key European and National Stakeholders, e.g. National Promotional Institutions (NPI);
- Focused research and communication activities on the topic, to improve quality and availability of data and promote awareness.

In conclusion, supporting female entrepreneurship can have positive impact on social and environmental issues, and investing in female entrepreneurs can be a valuable way to promote positive change. Given that the issues and causes in female access to finance are diverse – as outlined in detail above – there is also no "one fits all" solution. Only a variety of policy measures, both long term and short term, may prove effective at tackling the gender financing gap.

[10] For instance, encouraging employment, addressing social care issues typically related to women (childcare, etc.).

[11] InvestEU is the European Union's new programme to support sustainable investment, innovation and job creation in Europe. It aims to trigger more than EUR372bn in additional investment between 2021 and 2027.

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