

Gender Stereotypes and Entrepreneur Financing

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March 2023

Abstract

This paper examines gender differences at different stages of the entrepreneurship process using French administrative data. At the creation stage, women are less likely than men to start new firms and tend to sort into startups associated with lower growth potential. At the funding stage, female-founded startups are less likely to use VC financing relative to their male peers. Differences in startup characteristics, founders' preferences, and entrepreneurial abilities explain about one third of the gender gap. Two thirds remain unexplained. Furthermore, I show that female-founded startups outperform their male peers when they are provided with VC. The analysis is consistent with models of stereotypical beliefs, where VCs exaggerate representative features of entrepreneurs by gender group and overlook high-growth oriented female entrepreneurs.

Keywords: Gender gap, venture capital, startups, growth preferences, biases, stereotypes

JEL Codes: G24, G41, J16

*University of Toronto. email: camille.hebert@rotman.utoronto.ca. Previous versions of this paper have been circulated under the title "Mind the Gap". I would like to thank Pat Akey, Paul Beaumont, Sylvain Catherine, Claire Célérier, Zoe Cullen, Mike Ewens, Edith Ginglinger, Paul Goldsmith-Pinkham, Mariassunta Giannetti, Denis Gromb, Johan Hombert, Sabrina Howell, Nicolas Inostroza, Jessica Jeffers, Adrien Matray, Debarshi Nandy, Cameron Peng, Thomas Philippon, Manju Puri, Luc Renneboog, David Robinson, Oliver Spalt, Geoffrey Tate, Rick Townsend, and Tracy Wang for helpful comments and feedback. I am also grateful to seminar participants at BI Oslo, Università Bocconi, University of Colorado Boulder, Dartmouth College, HEC Paris, IFN, Indiana University, INSEAD, University of Maryland, University of New South Wales, NHH, University of North Carolina, Northwestern University, Ohio State University, Université Paris-Dauphine, University of Rochester, University of Southern California, Stockholm School of Economics, Tilburg University, University of Toronto, Vanderbilt University, University of Washington, and conference participants at the FIRS 2018 PhD session, Amsterdam Behavioral Finance Conference, 4th HEC PhD workshop, NFA 2018, Stockholm Gender Conference 2018, Paris December Conference, Colorado Finance Summit, WFA 2019, EFA 2019, the Miami Behavioral Finance Conference 2019 (Best Paper Award), NBER SI Entrepreneurship 2020, the AFA 2021 and the AEA 2022. I thank Marie Ekeland for sharing her views about the VC industry. This work is supported by a public grant overseen by the French National Research Agency as part of the "Investissements d'avenir" program (reference: ANR-10-EQPX-17 – CASD). I am responsible for all remaining errors.

1. Introduction

Is it worth being different? The large literature on discrimination against gender and racial minorities suggests it is not. For example, within symphony orchestras, female musicians are less likely to be hired (Goldin and Rouse, 2000). In the US, “Lakisha” and “Jamal” are less likely to be invited for an interview than “Emily” and “Greg” (Bertrand and Mullainathan, 2004). At S&P 500 firms, women make up 19% of board members and merely 5% of CEOs (Adams and Ferreira, 2009). Within academic fields, such as economics and finance, 33% of new PhDs are female, and 14% hold a full professorship (CSWEP, 2018; Barber et al., 2021; Sherman and Tookes, 2022; Adams and Lowry, 2022). In high-growth entrepreneurship, while female entrepreneurs represent approximately 30% of the population of start-up founders across time and countries, 10–15% of receive private equity (PE) and venture capital (VC) funding (Ewens and Townsend, 2020; Calder-Wang and Gompers, 2021).

In this paper, I explore the leaky pipeline of female entrepreneurship and ask whether female entrepreneurs are at a disadvantage in raising capital from external investors. Entrepreneurship involves multiple stages, such that the gender gap in VC financing could be the result of choices made prior the creation of the new venture or during the creation, the result of the decision to seek external financing sources, or due to investors’ beliefs when they source new deals (Ewens, 2022). Traditional explanations of the gender gap include gender differences in human capital accumulation, risk attitudes and preferences (e.g., Niederle and Vesterlund, 2007; Sapienza, Zingales and Maestripietri, 2009; Cook et al., 2021). As a result, women would not choose to start a new venture, or if so, with different motivations, in a different sector or a different type of firm. Another strand of the literature suggests that the gender funding gap in VC may be due to a lower propensity for investors to fund female entrepreneurs seeking capital. This view stems from the fact that over 90% of venture capitalists (VCs) are men (Gompers et al., 2022; Howell and Nanda, 2022). Anecdotal evidence also point out to the fact that some investors may be biased against women.¹ Therefore, understanding whether women face greater disadvantage at creation or whether such disparities tend to widen at the funding stage remain open questions. From a policy perspective, such understanding is critical for addressing gender inequality in

¹In the summer of 2017, several cases of discrimination against women in technology companies (e.g., Uber, Google) and VC firms (e.g., Kleiner Perkins Caufield & Byers, 500 Startups) highlighted the treatment of women in Silicon Valley. Other anecdotal evidence includes, for instance, the investor John Doerr who summed up his philosophy as follows: “Invest in white male nerds who’ve dropped out of Harvard or Stanford”, or the Witchsy cofounders who created a fake male co founder named “Keith Mann” to reach VCs via email and received an unprecedented number of replies (source: <https://goo.gl/VmLJNq>).

entrepreneurship and increasing female representation among high-growth entrepreneurs.

Exploring gender differences at each stage of the entrepreneurship process is challenging for at least two reasons. First, traditional datasets only capture information about firms that have successfully raised capital, which does not allow to assess the relative importance of each stage in generating less-favorable outcomes for female entrepreneurs. Therefore, it is unclear whether start-ups that did not raise capital were rejected due to objectively lower quality projects, because they did not seek VC financing or because of investors' biases. The profile of firms that could use VC but do not could provide a useful counterfactual to understand what makes a good candidate from an investor's point of view (Guzman and Kacperczyk, 2019; Ewens and Townsend, 2020). Second, sourcing deals in VC mostly lies on referrals and professional networks (Gompers et al., 2020; Howell and Nanda, 2022), such that data on who is considered is not recorded or centralized across VC firms, making demand and supply hard to disentangle in this context. Surveys attempting to recover entrepreneurs' intentions to grow could help to identify entrepreneurs who seek external financing. However, such information is often collected for small and selected samples.

In this paper, I use a unique combination of French administrative data with a large scale survey of entrepreneurs that is representative of the population of new firms founded between 2010 to 2018.² The advantage of using this data is that it is not subject to any sample selection biases, and I can compare the proportion of successfully funded entrepreneurs to the rest of the population. For each firm every year, the dataset contains the firm's corporate tax files (balance sheets and income statements) merged with detailed project characteristics, including incorporation status, starting capital, information on the business model, financing and income sources, as well as extended founders' biographical information. The first wave of the survey is sent at the end of the first year of operation and elicits founders' ex-ante growth and innovation preferences.³ In addition, the corporate tax files allow me to track entrepreneurs over time and regardless of their funding status, enabling me to characterize differences in the growth and performance of firms by founders' gender and funding status from the very early part of their life cycle.

²I also use earlier cohorts (2002 and 2006) to replicate my analysis. However, the survey sent to these cohorts did not allow distinguishing VC from other sources of external equity, which presumably mix up VC with angel investment, seed capital, and corporate venture capital. Using Crunchbase France, I replicate my main results by categories of external equity and find that the results are driven by disparities in VC investment.

³The survey is run every four years on a new cohort of randomly selected entrepreneurs that represents approximately 25% of the population of new firms founded in the first semester that year (see Landier and Thesmar, 2008; Hombert et al., 2020; Hebert, 2022, for other use of the data).

My analysis reveals that the gender gap widens along the entrepreneurship pipeline. At the creation stage, women are not only less likely than men to start new firms, they are also more inclined to sort into startups associated with lower growth potential. Female-founded start-ups account for 29% of new firms and represent 24% of all incorporated startups. Female entrepreneurs are also less likely to report preferences for growth and indicate that their primary motivation is to create their own job, as opposed to develop the startup. At the funding stage, female founders represent 28% of new firms that use bank debt, and only 14% of all VC-backed startups.

I show that the gender gap in VC financing is only partly explained by differences in startups' characteristics, founders' preferences and entrepreneurial abilities. Net of these gender differences, Female-founded startups are 45% less likely to raise and use VC financing relative to similar male-founded startups started the same year in the exact same activity.⁴ In contrast, I do not find any similar residual gender gaps in the use of bank debt or other loans and cash grants.⁵ The unique features of VC financing, such as their selection and monitoring effects, can explain why equity investors tend to focus on entrepreneurs' profiles more than other fund providers, and why the gender gap in VC may persist. First, soft information related to the entrepreneurs' profile may be the only information available to investors when they decide to back startups. This is because the evaluation of startups in VC is characterized by a high degree of information asymmetry with very little historical data and direct comparables (Brooks et al., 2014; Huang and Pearce, 2015; Bernstein, Korteweg and Laws, 2017; Gompers et al., 2020; Ma and Hu, 2022).⁶ In contrast, credit allocation in small business lending is mainly based on hard information (Petersen and Rajan, 1994).⁷ Second, banks tend to have more diversified portfolios and monitor to avoid default through the quality of collateral, whereas VCs monitor

⁴In the baseline specification, I control for founder's education, past industry and entrepreneurial experience, the team, the startups incorporation status and the founder's growth and innovation orientation. The regression model also include county and cohort times SIC-5 sectors fixed effects. France is split between 96 counties (departements), and the level 5 of the French SIC classification includes 496 sectors, which allows to distinguish between "Manufacture of electronic components" (26.11Z) from "Manufacture of computers and peripheral equipment" (26.12Z), for example.

⁵This result on the use of bank loans is in line with the existing literature on the gender gap in small business lending (Bellucci, Borisov and Zazzaro, 2010; Alesina, Lotti and Mistrulli, 2013) that finds that male and female entrepreneurs are equally likely to use bank loans for their business but women pay more for credit (a higher interest rate).

⁶In a survey of 885 investors and in a field experiment, Gompers et al. (2020) and Bernstein, Korteweg and Laws (2017), respectively, show that VCs rank the entrepreneurial team as the most important characteristic for evaluating investment opportunities. Using video pitches, Brooks et al. (2014), Huang and Pearce (2015) and Ma and Hu (2022) show that investors respond to intangible characteristics, such as positivity, and ask different questions depending on gender in the team.

⁷In line with this idea, I find that the ratio "Tangible assets/ total assets" is positively associated with the use of bank debt, but is not related to the use of VC.

more intensively through equity positions and extensive control rights (Kaplan and Stromberg, 2001; Hellmann and Puri, 2002). Finally, VCs impose liquidity restrictions on their limited partners, who demand higher returns from their investment, whereas banks are not interested in the business’s financial success beyond the repayment of the principal and interests (Winton and Yerramilli, 2008). In the rest of the paper, I focus on understanding the gender gap in VC financing.

My results show the gender gap in VC financing is more significant for highly skilled and ambitious female entrepreneurs, whereas the gender gaps in the first stages of the entrepreneurship pipeline close for these profiles of women. Serial female entrepreneurs, who graduated from elite schools, who have co-founders, who have preferences for growth and reported difficulties getting funding incorporate at the same rate than their male peers.⁸ However, at the funding stage, female entrepreneurs with prior entrepreneurial experience, who co-founded and incorporated the new firm, and who have preferences for growth and innovation are significantly less likely to use VC financing relative to their male peers. The evidence shows that characteristics positively associated with the use of VC for male entrepreneurs have no effect on female entrepreneurs’ use of VC. At the creation stage, if highly skilled and ambitious female entrepreneurs had different preferences, were behaving according to social predictions (Akerlof and Kranton, 2000), or if they were discouraged by barriers associated with starting in a male-typed occupation (Hsieh et al., 2019; Mertz, Ronchi and Salvestrini, 2022), they would sort into a different type of business (Levine and Rubinstein, 2017). However, the evidence shows that when the outcome depends only on their actions or preferences, i.e., incorporation status or choice of the sector, as opposed to funding decision, female-founded startups who meet the requirements for VC funding do not make necessarily different decisions than their male peers (Kumar, 2010; Adams and Funk, 2012; Adams and Ragnathan, 2017).⁹

The gender gap in VC financing does not seem to be simply explained by the omission of controls. The concern is that gender may correlate with unobserved entrepreneurs’ abilities or

⁸These female entrepreneurs are also more likely to opt for a male-dominated sector relative to female entrepreneurs who do not share these characteristics. Male- and female-dominated sectors are classified according to the gender distribution of entrepreneurs by sector. The baseline measure defines a sector as female-dominated if more than 50% of its population of start-ups is female-led. These sectors represent 11% of the sectors at the 4-digit French SIC. I provide alternative measures of gender-dominated sectors based on the populations of CEOs, business owners and business owners at new firms.

⁹Kumar (2010) finds that female financial analysts perform better than their male counterparts, suggesting that women who sort into male-typed occupations are not representative of the population. Adams and Funk (2012) and Adams and Ragnathan (2017) argue that women who sit on boards and reach top corporate positions are not necessarily different from men in those positions.

preferences (e.g., worse quality project or preference for non-VC funding), such that gender may simply be picking up omitted quality variables or unobservable preferences. I test the robustness of my empirical model following Oster (2019) and Ma and Hu (2022).¹⁰ I find that the estimated gender gap in the use of VC financing remains stable in economic magnitude and statistical significance. The statistical tests show that the effect of the gender gap in VC financing is robust to a wide set of variables regarding omitted start-up quality and founders' preferences, under the assumptions that potential omitted variables account for the same explanatory power than the observed control variables (Oster, 2019), and that the selected control variables are the most obvious and intuitive controls (Angrist and Pischke, 2010).

Moreover, I run four additional robustness tests to mitigate concerns relative to gender differences in the demand of external financing and the preference for alternative funding sources. Hence, female entrepreneurs with equally good projects and with the same founding preferences may seek VC financing at a different rate of than their male peers. First, I check that female entrepreneurs are still less likely to use VC even when controlling for the size of the project to finance, the invested startup capital, the family situation, other sources of income including other employment income and spouse income, and reported difficulties during the creation. Second, I restrict the control group to entrepreneurs who do not use VC, but who reported the ambition to grow the startup, whose new venture is incorporated, who reported difficulties in getting funding, who are serial entrepreneurs, and who do not have children. I do not find that the effect of gender is significantly different from those in the baseline sample, although one could have expected the potential downward bias to be reduced in these conditioned samples. Third, I verify that female entrepreneurs who use other financing sources are not less likely to use VC financing. I do not find any correlations between the use of bank financing and VC financing, neither for male-founded nor female-founded startups (Landier, 2003; Winton and Yerramilli, 2008).¹¹ Fourth, I do not find that the share of bank debt for VC-backed female-founded startups is greater than that of VC-backed male-founded startups, also suggesting no

¹⁰In all specifications, I include the extensive set of controls used in the literature, such as founders' education, past industry and entrepreneurial experience and team composition (e.g., Bernstein, Korteweg and Laws, 2017; Ewens and Townsend, 2020). In augmented specifications, I add entrepreneurs and startups' characteristics only available in the survey and the tax files, and usually unavailable in large-scale datasets (Guzman and Kacperczyk, 2019; Ewens, 2022). These unique variables include the incorporation status, ex-ante motivations, preferences for growth and innovation, family situation, start-up capital, other sources of financing and income, and detailed information about the business plan.

¹¹Instead, I find a positive correlation between the use of VC financing and the use of public grants, other loans and the use of other external equity financing sources, which suggests the existence of complementarity between these financing sources (Hellmann, Lindsey and Puri, 2007). According to the description of public grants take the form of cash transfer from a governmental agencies to the startups.

substitution effects between bank debt and VC financing. Furthermore, the share of inside equity is significantly reduced for VC-backed firms. Regarding the share of other funding sources, including VC, it represents 32% of VC backed male-founded startups, whereas this share is only 8% of VC-backed female-founded firm’s capital structure, suggesting that female founders who use VC use it relatively less than their male peers.¹²

My results show that significant residual disparities persist even net of differences in startup characteristics, growth preferences, and entrepreneurial abilities. An Oaxaca-Blinder decomposition reveals that about one third of the gender gap in VC financing can be explained by observed differences in founder’s education, prior experience, team composition, incorporation status and preferences for and growth and innovation (i.e., the explained composition effect, Blinder (1973); Oaxaca (1973)). However, about two thirds of the gender gap in VC financing remain unexplained (i.e., the unexplained effect). Specifically, differences in returns to preferences for growth and innovation drive most of the unexplained effect. Female entrepreneurs’ use or non-use of VC financing remains mostly unexplained by a model focusing on entrepreneurs’ abilities, preferences and choices made in earlier stages. My results show that founders’ preferences for growth help to explain male entrepreneurs’ use of VC financing, but not that of female entrepreneurs’. Instead, the evidence suggests that motivations and preferences that are positively perceived for male entrepreneurs, have a negative effect on the assessment of female entrepreneurs.

I design an “outcome test” to test whether differences in performance arise after providing male and female-founded startups with VC. If at the selection stage, requirements for funding are set at the correct level, we would not observe any systematic differences in performance between the two groups (statistical discrimination, Phelps et al., 1972; Arrow, 1973). In contrast, if one group has been held at a higher bar by investors, this group should outperform relative to the other group (taste-based discrimination Becker, 1957, 1993).¹³ I find that although the average new female-founded business tends to underperform, female-founded startups backed with VC outperform their male peers. VC-backed female-founded startups have a higher probability of survival after three years and significantly higher sales growth. The evidence suggests that

¹²These tests control for the start-up’ size of the balance sheet and assets tangibility.

¹³This intuition is also present in Shaffer (1996) for the lending market: It is possible for a profit-maximizing (and therefore economically nondiscriminatory) lending policy to generate lower average default rates among minority borrowers than among majority borrowers. These results demonstrate that policymakers and regulatory agencies must consider recovery rates in order to understand whether a particular pattern of default rates may imply discriminatory lending behavior.

female entrepreneurs who are VC-backed are held at higher standards.

Consistent with the Oaxaca-Blinder decomposition, the outcome test suggests that VC investors evaluate male and female entrepreneurs using different criteria. Consistent with the existence of gender stereotypes in the VC industry, VCs seem to exaggerate some representative features of success in their selection of entrepreneurs (Tversky and Kahneman, 1983; Bordalo et al., 2016). Since women are less likely to be entrepreneurs in the first place, and since the average female founded startup tend to sort in startup with lower growth potential, highly skilled female entrepreneurs with high growth preferences may be stereotypically perceived as less competent entrepreneurs, such that convincing investors that they are willing to pursue a high-growth oriented venture is more difficult. In addition, I implement a more direct test of the existence of stereotypes. I use the rich cross-section of sectors to test for the fit between gender and gender congruity of the sector (Coffman, 2014; Bordalo et al., 2019). I find that investors are not systematically biased against women (as implied by Becker, 1957, and taste-based discrimination). Female entrepreneurs in female-dominated sectors (gender-congruent sectors) are equally likely to use and raise VC relative to their male counterparts in these sectors and are significantly more likely to raise capital relative to female-founded start-ups in male-dominated sectors (gender-incongruent sectors). Even though several sources of discrimination may coexist, the pattern I find in the data is consistent with investors who have gender stereotypes (Coffman, 2014; Bordalo et al., 2016, 2019; Bohren, Imas and Rosenberg, 2019; Bohren et al., 2020).¹⁴

Taken together, my findings suggest that highly skilled and ambitious female entrepreneurs do not have different preferences and abilities than their male peers. Instead, investors seem to miss valuable investment opportunities by exaggerating some features of the average female entrepreneur. The evidence has important implications from the perspective of entrepreneurs, the VC industry, and the economy in general. First, entrepreneur's access to VC financing can make the difference between success and failure, given the advantage of these equity investors in advising start-ups and creating value (e.g., Kaplan and Strömberg, 2003; Puri and Zarutskie, 2012). Second, not financing the potential success of high-growth oriented entrepreneurs means that some VCs are deteriorating potentially better performance and are wasting the resources invested by their limited partners (e.g., Kaplan and Schoar, 2005). Third, failing to finance

¹⁴One limitation of this exercise is that even highly skilled and ambitious female entrepreneurs who incorporate new ventures and start in VC-intensive sectors may still hold back and not seek VC because they anticipate discrimination. However, to believe that anticipated discrimination explains these results, one needs to believe that a form of discrimination exists (Coffman, 2014).

female-founded start-ups may ultimately result in missed growth in the economy (Hsieh et al., 2019; Mertz, Ronchi and Salvestrini, 2022).

My paper contributes to the growing literature on gender and entrepreneurship. Prior literature established the fact that female entrepreneurs are less likely to use VC financing and focused on entrepreneur-investor homophily effects and connections (Brush, 1992; Becker-Blease and Sohl, 2007; Raina, 2019; Ewens and Townsend, 2020; Calder-Wang and Gompers, 2021; Gompers, Huang and Wang, 2021; Gornall and Strebulaev, 2022; Howell and Nanda, 2022).¹⁵ In particular, Ewens and Townsend (2020) and Raina (2019) find that female entrepreneurs seeking capital are less likely to be targeted by equity investors and perform worse conditional upon being VC-backed, respectively, but the effects disappear when female-led startups are targeted and advised by female investors.¹⁶ I find that female entrepreneurs are less likely to use VC funding relative to their male counterparts, the effect being even more significant for highly skilled and ambitious female entrepreneurs, who do not make choices different from their male peers at the creation stage, i.e., choice of sector and decision to incorporate. My results imply that women who meet the requirements of VC funding, do not have different growth and funding preferences, despite different VC funding outcomes.

This paper is also related to the literature on VCs' decision making

More broadly, this paper is related to the economic literature that investigates the origins of the gender gap and a more recent stream of literature in finance that focuses on labor market outcomes of executives and other high-skill workers (Barber and Odean, 2001; Bertrand and Hallock, 2001; Adams and Ferreira, 2009; Bertrand, Goldin and Katz, 2010; Matsa and Miller, 2011; Niessen-Ruenzi and Ruenzi, 2018; Huang and Kisgen, 2013; Fang and Huang, 2017; Azmat and Ferrer, 2017; Adams and Funk, 2012; Adams and Ragunathan, 2017; Duchin, Simutin and Sosyura, 2021; Egan, Matvos and Seru, 2022; Bennedsen et al., 2022; Davies, Van Wesep and Waters, 2023). My paper focuses on entrepreneurs and show that women who fit the profile of successful entrepreneurs who use VC financing, do not have different growth and funding preferences, pointing to the existence of gender stereotypes as a potential cause of the gender gap in VC financing and high-growth entrepreneurship.

¹⁵Another strand of the literature focuses on the creation of female-founded firms (Gottlieb, Townsend and Xu, 2022; Naaraayanan, 2021; Zandberg, 2021; Core, 2022).

¹⁶In an audit study, Gornall and Strebulaev (2022) show that VCs are more likely to reply to "cold" pitch emails sent by female founders than to those by male founders. This finding can be rationalized by networking frictions highlighted by Howell and Nanda (2022).

2. Data and Empirical Strategy

2.1. Data sources

My dataset consists of the merging of the SINE survey with corporate tax files available from the French Bureau of Statistics (Insee).

Survey of entrepreneurs. The *Système d'Information des Nouvelles Entreprises* (SINE) survey is a large-scale survey of entrepreneurs conducted by the French Bureau of Statistics every four years. Questionnaires are sent to approximately 25% of entrepreneurs who started or took over a business in France in the first semester of 2002, 2006, 2010, 2014 and 2018 (cohorts). The surveyed firms are randomly selected from firm registries. The response rate to the SINE survey is high (approximately 90%) because the tax authorities supervise the sending of questionnaires. The business owner is responsible for completing the documents.¹⁷

To study real start-ups, new entrepreneurs who inherited or took over an existing business are excluded from the sample. In the baseline sample, I consider only the 2010, 2014 and 2018 cohorts as VC financing was not an independent category and was blended with other forms of external equity financing in the earlier waves of the survey. Hence, the data set consists of a repeated cross-section of about 30,000 firms per cohort, that are then matched to the corporate tax files.¹⁸

Entrepreneurs report during their first year of operation the financing sources they rely upon.¹⁹ The answers are non-mutually exclusive: An entrepreneur can rely on external financing sources in addition to personal resources invested in creation. External financing sources are divided into debt and equity. Debt comprises *Personal loan*, *Bank Loans* and *Non-bank loans*. *External equity* encompasses *VC* and business equity.²⁰ *Public* is a very heterogeneous class

¹⁷More information about these data sources: www.insee.fr/sine and www.cnis.fr/sine. See also Landier and Thesmar (2008); Hombert et al. (2020) for other use of the data.

¹⁸I replicated my main results on the full sample 2002- 2018 (full cohort), using external equity financing as the main dependent variable instead of VC, and find similar results. Similarly, in the 2014 wave of the survey, crowdfunding introduced was introduced as a separate category. Note that the size of the 2018 cohort is half of the usual cohort's, as a new separate survey was introduced in 2018 to survey auto-entrepreneurs, a new regime of self-employment.

¹⁹For external equity financing, I compare self-reported access to external equity investors in the SINE survey to equity deals (Seed, VC, Growth equity, PE, and angel investors) reported in Crunchbase France and Pitchbook France. I observe a high correspondence between the matched firms in the two datasets, for early stage deals only.

²⁰VC and business equity provisions are pooled because they both involve a high degree of target selection and shareholder activism. In addition, a distinction between these two types of external equity is only possible in the 2002 cohort and from the 2010 cohort onward. The new item corresponding to venture capital - distinct

that includes equity stipends from various public programs.

Gender, age, and citizenship dummy variables are collected from the SINE survey. Education information is recoded such that cohorts can be compared over time. Education dummy variables include *No degree*, *High school*, *Undergraduate*, *Graduate degree*, and *Elite engineering school*. Additionally, entrepreneurs are asked about the number of years they have worked in the industry where they start the new venture, and the number of start-ups they have founded previously. I code a dummy *Expert* if the entrepreneur reports at least three years of industry experience. The dummy variable *Serial* indicates whether the entrepreneur had founded a start-up before the one targeted by the questionnaire. Entrepreneurs are also asked about their family situation. I encode the variable *Married* if the entrepreneur reports to be married or living in common-law, and the variable *Children* if she reports to have any children at the time she starts.²¹

In the survey, entrepreneurs are asked about their motivations for founding a start-up and their desire to grow the founded start-up. I identify an entrepreneur as *High-growth oriented* if he aims “to develop the company” as opposed “to create his own job”. In a separate question, entrepreneurs report up to three of their main motivations for founding a start-up among the following propositions: *Add earnings* to the household; desire for *Independence*; address unemployment; follow a *Taste* for entrepreneurship and new challenges; take on an *Opportunity*; and explore a *New idea* for a product, service, or market. Entrepreneurs also report their detailed incorporation status which I classify between *Incorporated* and *Self-employed*.²² The incorporation status accounts for the fact that entrepreneurship aggregates different types of activities and individuals, making little distinction between high-growth oriented entrepreneurs and survival entrepreneurs (Schoar, 2010; Levine and Rubinstein, 2017).

Tax files. *Bénéfices Industriels et Commerciaux* and *Bénéfices Non-commerciaux* augmented by employer payrolls (*Déclarations Annuelles des Données Sociales*) provide detailed yearly accounting (balance sheet and income statements) and employment information at the firm level between 2002 and 2017. The tax files cover all firms subject to either the regular corporate tax

from external equity provisions - as a financing source was introduced in the 2002 cohort questionnaire. It was then removed in the 2006 cohort’s questionnaire and finally reintroduced in the 2010 cohort.

²¹Note that the survey does not ask this question again in the follow-up questionnaires. The question about children is asked only to the 2006, 2014 and 2018 cohorts.

²²In France the distinction is between a *personne morale* versus a *personne physique* status. The *Personne morale* status includes societe anonyme (SA), SARL, SAS, SNC and other status. The *Personne physique* status artisans-commerçant, profession liberale, Exploitant agricole and other status that are less commonly used.

regime or the simplified corporate tax regime.²³ From the tax files, I retrieve sales, employment size, total assets, earnings before interest and tax (EBIT) and net income. Incorporation status, location (county level) and industrial activity (5-digit SIC level) are also collected from the tax files.²⁴

2.2. Empirical Strategy

The aim of the empirical analysis is to quantify the gender funding gap and to identify the different factors that explain it.

Gender gap in VC financing. I start by comparing male- and female-founded start-ups' VC financing outcomes within sector. The empirical specification is given by the following equation:

$$VC_i = \lambda_z + \lambda_{kt} + \delta Female_i + \beta' X_i + \varepsilon_i \quad (1)$$

where VC_i is a dummy variable that takes the value one if the start-up i operating in sector k and county z and belonging to cohort-year t uses VC for her start-up at the end of the first year of operation, zero otherwise; λ_z and λ_{kt} correspond to zip code and sector \times cohort-year fixed effects, respectively; and X_i represents a vector of additional entrepreneur and start-up characteristics. X_i comprises the start-up's incorporation status, preferences for growth and innovation, and the biographical characteristics of the entrepreneur, such as age, French citizenship, undergraduate and graduate education and industry and entrepreneurial experience dummy variables.

In other specifications, I also consider the use of alternative financing sources, such as any *External financing* sources, *External equity* financing including VC, *Banks loans*, *Personal debt*, *Microcredit*, *Other loans*, and *Public grants*. All variables are defined in table 1.

The main independent variable in all my specifications is the dummy *Female*, which cap-

²³Note that for firms in the 2018 cohort I do not have access to their tax files to date. Small firms with annual sales below €32,600 (€81,500 in retail and wholesale trade) can opt out and choose a special micro-business tax regime (called *micro-entreprise*). Income falling into this category is taxed at the personal level. These firms do not, therefore, appear in the corporate tax files.

²⁴France is divided into 101 counties (*départements*). The French SIC is the *Nomenclature des Activités Françaises* (NAF) and consists of 640 sectors at the 6-digit level. A major change in the French SIC occurred in 2008 (NAF rev.2) and necessitates the following adjustments to preserve the industry panel structure of the data. In the tax files, the SIC codes before 2008 are given in the old classification. I retrieve the SIC codes of firms before 2008 from the retroplated firm registries and use the most likely correspondence between the two classifications if not available in the firm registries.

tures the founder’s gender. This models control for fixed characteristics across sectors and locations. In particular, they account not only for the fact that entrepreneurs with specific abilities may cluster in certain sectors and geographies but also for the fact that VCs specialize in specific sectors and choose to establish their businesses in certain local areas. A $\delta < 0$ implies the existence of a gender funding gap. However, comparing male and female entrepreneurs within a sector and a geography does not allow me to disentangle between demand and supply-side factors that explain a potential gender gap in financing.

The ideal empirical specification would be to introduce entrepreneur fixed effects to capture unobservable entrepreneur’s ability and startup’s quality. Such a specification would require several observations of the same entrepreneur’s financing outcomes, i.e., serial entrepreneurs or successive applications, as well as variations in the founder’s gender within startups over time. Nevertheless, the data does not allow to link companies founded by the same serial entrepreneur, and in the case of early stage company, the founders’ gender does not usually vary within firm in the first years after creation. As a result, the empirical analysis needs to build on assumptions regarding the sources of variation in entrepreneurs’ abilities.

Omitted variables. Equation 1 assumes that conditioning on the controls X_i perfectly accounts for gender differences in abilities and preferences. To some extent they do. However, it is possible that omitted variables drive the results. My answer to this argument is threefold.

First, I control for a large range of individual characteristics (X_i) arguably correlated with entrepreneurial abilities and preferences. In the baseline models, I control for education, industry expertise, entrepreneurial experience, team composition, incorporation status, and preferences for growth and innovation. Thanks to the uniqueness of the SINE survey, I can control for individual characteristics not commonly available in large datasets (Guzman and Kacperczyk, 2019; Ewens, 2022). Specifically, entrepreneurs are asked about their family situation and their ex-ante motivation for creating a start-up (desire for independence, extra earnings, opportunity, taste, new ideas, successful model). Entrepreneurs are also asked at the time of founding about their business model, startup capital, their sources of income, their sources of financing, which are factors that may influence the need for external financing and the preference for using VC as opposed to other financing sources. Moreover, I follow Oster (2019) and Ma and Hu (2022) to test the robustness of the model to omitted variables (see section 4.5 for more details).

Second, differences in demand for VC financing may ultimately explain differences in financing outcomes overall. However, in the context of VC, the demand and applications for this type of financing is not observable Gompers et al. (2020). However, the survey and decisions made at creation allow to infer profiles of entrepreneurs that are likely to seek VC funding for their startups. Entrepreneurs who incorporate startups as opposed to remain self-employed (Levine and Rubinstein, 2017), who report the ambition to grow as opposed to create their own job (Schoar, 2010), or who choose to start in a VC-intensive sectors are more likely to use external financing for their startup. However, female entrepreneurs may prefer using alternative financing sources such as bank debt instead of VC to finance their startups. I test whether a correlation exists between the use of VC and the use of the alternative financing sources available to entrepreneurs. A negative correlative would indicate that entrepreneurs substitute VC by another source of financing. Moreover, I use the answer to a question that ask entrepreneurs about their main difficulties at creation. An entrepreneur who says that “getting funding” was her main difficulty is financially constraint and would arguably use VC financing if available.

Third, another concern is that entrepreneurs may hold back, may not peruse high growth entrepreneurial strategies, and would not seek external equity financing, because they anticipate discrimination. Studying the self-selection of entrepreneurs in high growth entrepreneurial strategies and identifying where the entrepreneurial pipeline leaks would be helpful to address this concern. If that is the case, we would observe that even serial female entrepreneurs, female entrepreneurs who hold degrees from Elite school or start in team with preferences for growth or innovation would choose not to start in male-dominated sectors or to incorporate the new venture. In additional tests, I endogeneize the choice between a female- versus a male-dominated sector, as well as the choice to incorporate the startups. I regress this choice on the individual characteristics interacted with gender. This test captures observable differences in entrepreneurs’ ability and preferences by entrepreneurial strategy.

Fourth, in the spirit of Becker (1993), I design an “outcome test”. The idea is to test whether founders by gender group perform differently depending on whether they use VC. If at the selection stage, the bar was set at the correct level, i.e., true average abilities of their gender group (statistical discrimination), we would not observe any systematic differences in performance between the two gender groups. In contrast, if one group has been discriminated against, this group should outperform relative to the other group, under the assumption that

entrepreneurs' abilities are constant over time.

Empirically, I interact gender with the VC financing status on measures of start-ups' future performance and growth.

$$\begin{aligned} \text{Future Performance}_{i,\Delta t} = & \lambda_z + \lambda_{kt} + \lambda_t + \delta_1 \text{Female}_i + \delta_2 \text{VC}_i \\ & + \delta_3 \text{VC}_i \times \text{Female}_i + \beta' X_i + \varepsilon_{i,t} \end{aligned} \tag{2}$$

where $\text{Future Performance}_{i,\Delta t}$ corresponds to the start-ups' future performance up to three years after creation. Statistical discrimination predicts no systematic differences in future performance between genders, such that $\delta_3 = 0$. The biased beliefs view predicts that successfully funded female entrepreneurs outperform their male counterparts ($\delta_1 + \delta_2 + \delta_3 > 0$) who started the same year, in the same activity and in the same county. Finally, an alternative view called positive discrimination would predict that minorities are overfunded, such that entrepreneurs from the minority group should perform worse than entrepreneurs who belong to the majority group ($\delta_3 < 0$).

3. Descriptive Statistics

3.1. The gender gap over time

Table 1 Panel A shows that female entrepreneurs found 28% of the 132,301 new firms in the 2002-2018 cohorts. The gender gap is slowly closing, starting from 27% in 2002 to 30% of female founders in 2018, confirming the existence of a large and persistent gender gap in entrepreneurial participation. Panel B shows that among incorporated startups female-founded startups represent 24% of them. Female entrepreneurs also represent 63% of entrepreneurs who report a preference for growth whereas they represent 30% of entrepreneurs who state a preference for independence as one of their primary motivation for founding the new venture.

The evidence also show that female-founded startups represent only 21% and 15% of new firms in male-dominated sectors and in innovative sectors. Figures 3 also plot these gender gaps. The evidence also shows that female entrepreneurs represent only 14% of VC-backed entrepreneurs. The gender gap is smaller if we consider other sources of outside equity financing

(19%). Regarding the overall percentage of female-founded startups which use any sources of external equity financing, the evidence show that entrepreneurs represent 29% of them, which is in line with the overall representation of female entrepreneurs. The results also do not show statistical different gender gaps from the female representation for other individual sources of external financing. Female-founded startups represent 28%and 32% of startups that use bank loans and personal debt, respectively.

[Insert table 1 here]

3.2. Are male and female entrepreneurs different?

Table 1 shows that approximately half of the entrepreneurs are 40 years or older. Female entrepreneurs are, on average, younger and are more likely to be French citizens than male entrepreneurs. Regarding education, the average female founder is more educated than the average male entrepreneur: 47% of male entrepreneurs and 58% of female entrepreneurs hold a bachelor's or higher degree. However, among highly educated entrepreneurs, men are twice as likely to have graduated from a French elite school.

Female entrepreneurs have less industry experience and are less likely to have already founded a company. Of male founders, 72% indicate having at least three years of experience in the sector before starting up, while only 61% of female founders do. While 33% of male entrepreneurs have already founded a start-up, whereas only 22% of female entrepreneurs did.

Regarding family structure, in my sample, 70% of entrepreneurs are married or in a relationship, and 55% have children. Female entrepreneurs are less likely to be married and more likely to have children than male entrepreneurs. Regarding the composition of the founding team, I find that female and male entrepreneurs are equally likely to start with co-founders (25%) and to found the firm with a relative (4%). Female entrepreneurs are more likely to launch a new business with their spouse than men (10% versus 8%) and less likely to start with business partners (12% versus 14%).

Regarding motivations to create a start-up, female entrepreneurs are less likely to be high-growth oriented (27% versus 37% of males). Similarly, male-founded startups are more likely to ve incorporated than female-founded startups (66% versus 51% for females). The average entrepreneur's main motivation is to becoming independent (60%), and to a lesser extent, because

of a taste for entrepreneurship (43%). Female entrepreneurs are less likely to indicate that they started a business because they had a taste for entrepreneurship but are more likely to report that they founded their company because of an opportunity. Male and female entrepreneurs are equally likely to start because of a new idea (15%) or because of successful peer (10%).

46% of entrepreneurs describe their business as innovative. Whereas female entrepreneurs are overall more likely to introduce a product innovation (41% versus 38% of men), male entrepreneurs are more likely to introduce innovations in terms of production and organization, 11% and 16%, respectively. Regarding other aspects of the business model, male-founded startups are more likely to be B2B (44%), whereas female-founded startups are more likely to be B2C (28%). Most startups have local customer base (58%), and especially female-founded startups (68%).

[Insert table 1 here]

What makes a female entrepreneur? Consistent with the univariate comparisons, appendix table A1 shows that female entrepreneurs are 6% more likely to have an undergraduate degree and 7.5% more likely to hold a graduate degree, but 14% less likely to hold the degree from an Elite school. Female entrepreneurs are 7% less likely to have significant industry experience and 8% less likely to have already founded a start-up compared to male entrepreneurs who started in the activity, the same year, and in the same cohort. Female entrepreneurs are 2% more likely to start with co-founders and more likely to start an innovative business. Regarding preferences for growth, I find that female entrepreneurs are respectively 4% less likely to incorporate the startup and to report the ambition to growth. However, they are less likely to start from a desire for independence or taste for entrepreneurship; instead, their entry is driven by perceived opportunities and successful peers.

What makes a high-growth entrepreneur? In columns (3) and (4) of appendix table A1, I regress the preference for growth, as opposed to create one own's job, and the incorporation status on individual characteristics. The evidence shows that serial entrepreneurs who graduated from an elite school are more likely to report preference for growth and incorporate the startup. Entrepreneurs who start in team are also 12% and 15% more likely to report preference for growth and to incorporate, respectively.

I also find a strong correlation between preference for growth and decision to incorporate. Entrepreneurs who report preference for growth are 11% more likely to incorporate. Regarding detailed motivations to start, I find that entrepreneurs who report taste, because of a new idea or because of an opportunity are significantly more likely to report preference for growth and make the decision to incorporate, whereas entrepreneurs because of a desire of independence are significantly less likely to do so. These correlations between high-growth orientation and the incorporation give us confidence about what these variables capture.

3.3. Are male- and female-led start-ups different?

Table 1 panel D shows 50% of new firms start with less than €4,000 of startup capital, whereas 10% of new firms start with €40,000 or more. Conditional on starting with €16,000 or more capital, I do not find any difference between male and female-founded startups. However, the evidence shows that there are 5% of male-founded startups that start with a capital greater than €160,000, and only 3% of female-founded startups.

Regarding external financing, 41% of entrepreneurs rely on external financing. Most of them use bank debt (Robb and Robinson, 2014). Specifically, 28% of start-ups have bank debt at the end of the first year of operation, 10% use a personal loan, and 10% have non-bank debt, in the form of microcredit, crowdfunding or other loans. In addition, 2.8% of the start-ups use external equity financing including 0.3% of startups that use VC (Puri and Zarutskie, 2012). Specifically, 0.4% of male-founded start-ups and 0.1% of female-founded start-ups are VC-backed.²⁵

Regarding start-ups' number of employees size and performance, at the end of the year of creation, 79% of firms do not have any employees, whereas 2% of them have 6 or more. Although female entrepreneurs start smaller start-ups on average, the difference is smaller for the top buckets of the employment distribution. The average female-led start-up is also smaller in terms of asset size and has a higher ratio of tangible assets. Considering the unconditional means of performance, new female-led firms are less profitable over the first five years after creation than their male counterparts in terms of sales, EBIT, and ROA. In addition, female-led start-ups are incorporated into larger and more feminized sectors, but their environments

²⁵These figures correspond to approximately 300 firms that receive VC funding from 2010 to 2018 in my sample. External equity financing is arguably an important funding source for start-ups from a qualitative perspective, as investors target start-ups with high growth potential in terms of employment and revenues.

are on average not less competitive.

4. The Gender Funding Gap

4.1. Gender gap in VC financing and alternative financing sources

I study the likelihood of male and female entrepreneurs of using external financing sources. I compare male and female-founded startups started the same year (cohort), within the same sector of activity (5-digit French SIC), and within the same county (French departments). I control for observable differences between male and female entrepreneurs' biographical characteristics that are arguably correlated with entrepreneurial abilities and with the use of VC financing. Standard errors are clustered at the 5-digit SIC level. Table 3 reports the results with fixed effects and controls, whereas figures 1 plots the unconditional gender gaps for VC financing, bank loans and public grants.

[Insert figure 1 here]

I find that female-founded start-ups are 40% ($= \frac{-0.0012}{0.0030}$) less likely to use VC financing relative to similar male-founded startups (column 1). Column 2 shows that female-founded start-ups are 27% ($= \frac{-0.0075}{0.0277}$) less likely to use sources of external equity. However, when I look at the likelihood to use any other source of external financing, I do not find that female-founded startups are less likely to use external financing (column 3).²⁶

Digging into the alternative sources of external financing available to startups, I find that female entrepreneurs are equally likely to use public grants or other subsidies relative to male entrepreneurs (column 4). Regarding bank loans granted to the firm, I also find that female entrepreneurs are equally likely to use bank loans for their startups (column 5). However, in column 6, the results show that female entrepreneurs are 8% more likely to use personal debt

²⁶In appendix table ??, I replicate the main results on the sample containing the 2002 to 2014 cohorts for which VC financing is pooled with other sources of external equity financing, and for which I have access to the tax files for all firms. The results shows that female-founded startups are 25% ($= \frac{-0.0073}{0.00284}$) less likely to use external equity financing. They are equally likely to use other external financing source including public grants, bank debt, and microcredit. Thanks to the balance sheets' availability for the 2002–2014 cohorts, I show that Log(total assets) at the end of the first year of operation is positively correlated with the use of external equity financing, all external financing, bank debt and other loans. Asset tangibility is an important predictor of the use of debt and public grants, whereas it is not significantly related to the use of external equity. More specifically, firm's size and asset tangibility do not correlate with the use of VC financing. This finding is consistent with the idea that banks focus on the quality of the collateral, in contrast to equity investors, who place greater weight on the entrepreneurs' profile in their decision to invest capital.

to finance the new venture relative to their male peers. On average, 10% of new firms use personal bank debt. Looking at other types of debt such as microcredit, other informal loans and crowdfunding (column 7), and other loans including zero-percent loans programs (column 8), I find that female entrepreneurs are also 25% more likely to use these types of debt financing. Overall, the average female-founded startup is less likely to use VC financing, but she is more likely to use non-bank debt or personal debt. However, these financing sources may uncover different profiles of entrepreneurs.

Next, I dig into the correlations between the different sources of financing and individual entrepreneurs and startups' characteristics. The evidence shows that age and being a French national do not correlate with the use of VC, but are negatively related with the use of bank debt. Interestingly, the use of microcredit and informal loans are correlated with not being French citizen. Regarding education, I find that having a graduate degree and especially one from an elite school is positively correlated with the use of VC and other sources of external equity, whereas entrepreneurs who use external debt are less likely to have a graduate degree. Only entrepreneurs who use corporate bank debt are more likely to have an undergraduate degree, although having a graduate degree has no significant impact. The evidence also shows that industry experience – at least three years of industry in the same sector – is negatively correlated with the use of VC financing. In contrast, being a serial entrepreneur – having founded at least one startup in the past – is positively correlated with the use of VC and other sources of external equity. I find the opposite effect for bank debt. The use of corporate bank debt is positively correlated with industry experience, but negatively correlated with entrepreneurial experience.

Regarding the new venture's incorporation status, I find no significant effect on the use of VC, especially after controlling for entrepreneurs' growth preferences. The evidence shows a strong and positive correlation between the preference for growth and innovation and the use of VC. Entrepreneurs who report, as their main motivation, the ambition to grow the new venture as opposed to be create their own job are twice more likely to use VC for their startups. The effect is similar for entrepreneurs who state that their new venture is innovative. High-growth and innovative orientation are also positively related with the use of debt, and external financing in general.

Overall the evidence in table 3 show that entrepreneurs individual characteristics that

positively correlate with the use of VC are negatively correlated or not significantly related with the use of personal debt. The evidence suggests that entrepreneurs who use VC and entrepreneurs who use personal bank debt or non-bank debt to finance their new venture are different entrepreneurs. Hence, it is unlikely that a female entrepreneur who could use VC and does not, choose an alternative financing source.

[Insert table 3 here]

4.2. The gender gap is driven by highly skilled female entrepreneurs

In table 4, I dig into profiles of female entrepreneurs who use and do not use VC financing. I interact the entrepreneur's gender with proxies of entrepreneurial abilities and growth preferences, while controlling for the baseline set of controls and fixed effects. Notably, in column 1, I find that female entrepreneurs who are first time entrepreneurs are not less likely to raise VC financing. Instead, the gender gap in VC financing is driven by those female entrepreneurs who have already founded startups in the past. In column 2, the evidence shows that the gender gap is driven by female entrepreneurs who started the new venture in teams. Having entrepreneurial experience and having co-founders are significantly and positively associated with a greater use of VC financing for male-founded startups, but not for female-founded startups.

The results in column 3 show that female entrepreneurs who make the decision to incorporate the startup are equally likely to use VC as self-employed male entrepreneurs. In contrast, incorporated male-founded startups are 37% ($=0.0011/0.003$) more likely to use VC financing. Similarly in column 4, female entrepreneurs who have high-growth oriented preferences are 60% less likely to use VC relative to male entrepreneurs with the same founding motivations. These women have the same probability to use VC financing than male entrepreneurs who do not have the ambition to grow the startups, but to create their own job. Male entrepreneurs who have preferences for growth are, in contrast, twice more likely to use VC relative to other male entrepreneurs.

Moreover, in columns 5 and 6, the results show that the VC gender gap is also driven by innovative female-founded startups and female entrepreneurs who report having difficulties raising funding. These results are puzzling. If the baseline estimation suffered from a downward bias, we would expect a positive effect of the interaction between gender and entrepreneurs' abilities and preferences usually associated with a greater use of VC financing. In contrast, we

find that incorporating the startups, having innovative and growth preferences, being a serial female entrepreneurs and having co-founders have a negative impact on the use of VC for women only, whereas these characteristics are positively associated with the use of VC financing for male entrepreneurs.

Overall, the results show the gender gap in VC financing is driven by highly skilled and ambitious female entrepreneurs. In contrast, female entrepreneurs who do not have the skills and motivations typically associated with the use of VC have the same likelihood to use VC than their male peers. The evidence could suggest that highly skilled and ambitious female entrepreneurs have preferences for financing their startup that are different from similarly skilled and ambitious male entrepreneurs, whereas male and female entrepreneurs who are less skilled and ambitious look alike. Alternatively, the results could be explained by the presence of gender stereotypes in the VC industry. VCs would assess skills and motivations differently depending on the entrepreneur's gender and even in the presence of signals that could be interpreted as indicative of high entrepreneurial ability, female entrepreneurs would struggle in raising VC financing.

[Insert table 4 here]

4.3. The gender gap is driven by female entrepreneurs in VC intensive sectors

In addition, I investigate which sectors drive the gender gap in VC financing. In this section, I show that the gender gap in VC is amplified in sectors that attract most VC funding. The scatter plot in 2 shows that there are fewer VC deals in sectors that have a higher share of female-founded startups. Similarly, figures 3 show that the gender gap is larger in innovative sectors and in male-dominated sectors than in sectors not classified as innovative and in female-dominated sectors, where more than 50% of start-ups in the 5-digit SIC are female-founded. In table 5, I interact the founder's gender with sector characteristics. Regression models include the baseline set of controls and sector, cohort and county fixed effects.

[Insert figures 2 and 3 here]

In column 1 of table 5, I find that female-founded startups are 50% less likely to raise VC financing in male-dominated sectors, whereas they are equally likely to use VC financing in female-dominated sectors. In column 2, the result shows that female-founded startups are 2.7

times less likely to use VC financing compared to male-founded startups in innovative sectors, whereas they are equally likely to use VC in other sectors. In sectors characterized by a higher number of VC deals, female entrepreneurs are also less likely to use VC financing. One more VC deal in the sector is associated with a 0.5 percentage point lower probability that a female founded startups use VC financing.

In columns 3 and 4, I consider the effect of sectors' concentration and competitiveness using the Herfindhal index. In the most concentrated sectors, measured as sectors in the top quintile of the Herfindhal index distribution, I find that female entrepreneurs are twice less likely to use VC financing than their male peers. In contrast, in the most competitive sectors, female-founded startups are significantly more likely to use VC financing. Female entrepreneurs are equally likely to use and have access to VC financing relative to male-founded startups in these sectors. Hence, as predicted by theories of statistical discrimination Arrow, Phelps, competition has a positive effect on the use of VC financing by female entrepreneurs. I find a similar effects for sectors characterized by high profit margins (column 5).

Overall, the results show that female-founded startups are less likely to use VC financing in sectors that attract more VC deals. Female entrepreneurs in these sectors could have different funding preferences than men in these sectors, whereas they could be more similar in sectors where VC financing is less of an option. Alternatively, VC-intensive sectors could reveal investors' biased beliefs about gender.

[Insert table 5 here]

4.4. Substitution and complementarity with alternative financing sources

4.4.1 Are female entrepreneurs less likely to seek VC?

One specific concern with the interpretation of the coefficients in the baseline model (table 3, column 1) is that we cannot tell whether female-founded start-ups are less likely to use VC, because their applications were more often rejected or because they never seek VC. However, my data allow me to observe firms that have not raised VC but were likely applicants, namely, entrepreneurs whose profile or growth preferences are correlated with the use of VC. The approach in appendix table A2 consists in conditioning the sample on these characteristics while controlling linearly for the other baseline controls.

Column 1 shows that female-founded startups are 42% ($= \frac{-0.0021}{0.005}$) less likely to use external equity financing. In column 2, I focus only on the sub-sample of incorporated startups and I find that female entrepreneurs are 45% ($= \frac{-0.0018}{0.004}$) less likely to use VC financing. In column 3, I retain only entrepreneurs who have preferences for growth and find evidence that female entrepreneurs are still 32% less likely to use VC financing relative to their male peers. In column 4 and 5, I keep only entrepreneurs who are likely to be financially constraint. Among entrepreneurs who report having difficulties getting funding, female founders are 38% less likely to use VC financing. Moreover, incorporated female-founded startups that have not used on any external financing sources to date, are also significantly less likely to use VC financing, although their incorporation status may indicate the willingness to grow.

The coefficients reported in appendix table A2 are not statistically different from the coefficients estimated on the baseline sample. If the baseline estimation suffered from a downward bias due to not observing the demand for VC financing for instance, we would expect the effect of gender to be significantly smaller when we estimate it on a sample of entrepreneurs with more homogeneous characteristics, that is on average more likely to seek VC financing. Two possible channels could explain this finding. First, composition effects or the gender differences in responding to the survey question could explain it. Female entrepreneurs are significantly less likely to self-identify as high-growth oriented, although it exists a positive correlation between reporting to be high-growth oriented and the use of VC (see appendix table A1). Second, cognitive and non cognitive traits may be perceived differently by investors depending the gender. Section 5.2 distinguishes between these two explanations.

4.4.2 Do female entrepreneurs substitute VC with alternative external financing sources?

If female entrepreneurs are less likely to use VC financing, how do they finance their growth? Do they substitute VC with alternative financing sources? If women were more likely to use other financing sources, we would observe a negative correlation between the use of VC and the alternative financing source for female-founded firms only. Appendix table ?? reports the results of the interactions between the female gender and other financing sources on the use of VC. All models includes the baseline controls and fixed effects.

Results reported in columns 1 and 2 show that the use of bank debt is orthogonal to

the use of VC for both female and male-founded startups. Female entrepreneurs are unlikely to substitute the lack of VC by bank debt. However, Results in columns 3 and 4 show the existence of complementarities between the use of other debt and other external equity, with no difference by gender. I find a positive correlation between the use of microcredit and other debt, with the use of VC. Results in column 5 shows a positive correlation between the use of public funded grants and VC financing, for male-founded startups. The effects is significantly smaller for female-founded startups, which suggests the existence of substitution effects when cash transfers happen. Finally, regarding the use of other sources of external equity financing in column 6, I find a strong positive correlation between the use of these alternative equity financing sources and VC financing, although there is no significant difference between male and female entrepreneurs.

4.4.3 Do female entrepreneurs substitute VC with personal resources?

Next, I investigate the potential substitution effects between external financing sources and personal resources. In the 2010 cohort of new firms, entrepreneurs report the share that inside equity, bank debt and other funding sources, respectively, represent in the new firm at the end of the first year of operation. Table 6 regresses the shares on the use of VC interacted with the founder's gender. Regressions include cohort, sector, and county fixed effects, in addition to the baseline controls, and the firm size and asset tangibility at the end of the first year of operation that are available in the tax files for the 2010 cohort.

Results in column 1 show a strong positive correlation between the use of VC and the share of other fundings, suggesting that conditional on being VC-backed, other fundings are likely to be mostly VC. While other funding sources represent 7% of the assets of the average startup, the share of other funding in VC-backed startups is 31% greater. However, the share of other fundings in female-founded startup that use VC money is significantly smaller than that of their male peers. While I do not find that other funding sources represent a different share in the average male and female founded startup, the evidence shows that VC backed female-founded startups have a significantly smaller share of other findings than similar male founded startups. VC backed female-founded startups have only 8% (=31%-23%) more other funding than the average startup. The evidence shows that female entrepreneurs who use VC, use it relatively less than their male peers.

Regarding the share of inside equity, I find that the average female founded startup use 1.5% less personal resources than the average male-founded startup (baseline = 62%). Moreover, startups that use VC have 28% less inside equity, which is close in magnitude to the share of additional other fundings that VC-backed startups display (column 2). The evidence suggests that VC financing substitutes inside equity. However, I do not find that substitution effect between inside and external equity financing is attenuated for female entrepreneurs which is in line with the fact that the share of external equity injected in VC-backed female-founded startups is significantly lower than that of males'. Finally, bank loans represent about 30% of the average startups' capital structure with no significant difference by gender and VC funding status (column 3). The evidence shows that the use of bank loans is uncorrelated with the use of VC, confirming the absence of substitution effects.

[Insert table 6 here]

4.5. Quantifying the omitted variable bias

Next, I quantify the size of the potential omitted variable bias in the baseline specification. I follow Oster (2019) and Ma and Hu (2022) to test the sensitivity of the use of VC financing to the entrepreneur's gender, when including more observed control variables. The idea is that if the coefficient is stable after inclusion of the observed controls, this is taken as a sign that omitted variable bias is limited. In table 7, I compare the effect of gender on the use of external equity in an uncontrolled regression (column 1), in the baseline regression model (column 3), and in an augmented controlled regression model (columns 4 to 6).

The baseline model includes the basic set of startups and human capital control variables in addition to the baseline set of fixed effects (see column (1) of table 3). The augmented model reported in column 3 includes the baseline controls in addition to detailed motivation variables that are rarely available in entrepreneurship datasets (Guzman and Kacperczyk, 2019; Ewens, 2022). In addition, the model in column 4 includes dummy variables related to the business model including whether the startup focuses on B2B or B2C clients, whether the customer base is local, national or international, and the number of clients. Column 5 additionally includes other financing sources available to startups as well as dummy variables that categorize the starting capital. The evidence shows that the estimates are very similar in the baseline and the augmented specifications, indicating that my results are unlikely to be driven by omitted

variables bias. Indeed, the coefficients reported in table ?? remain stable after introducing more controls that are likely to be correlated with the entrepreneur’s gender.

Beyond the intuitive interpretation of adding more controls to the regression, we can also perform a formal test adapted from Oster (2019). The test incorporates the change in R^2 s induced by adding controls, and argues that the size of the R^2 change is also informative in judging whether the stability of the estimated coefficient of interest is sufficient to argue away from the omitted variable problem. I call the uncontrolled (u) and controlled (c) regressions (baseline model), respectively. I denote their estimates and R^2 as (u, R_u^2) and (c, R_c^2) . Since the test is designed for one variables only, I retain only the female entrepreneur coefficient and not the interaction between female and female-dominated sectors. Hence, I run the following linear model of:

$$1(Externalequity) = \alpha + Female + \gamma\dot{X} + \delta_{FE} + \varepsilon$$

The OLS estimates used in this test are provided in table ?. Oster (2019) defines the bias-adjusted coefficient, denoted as adj that depends on two parameters, δ and R_{max}^2 , and is given by the following equation:

$$adj =_c -\delta \frac{(u-c)(R_{max}^2 - R_c^2)}{R_c^2 - R_u^2}$$

To obtain an identified set of coefficients, the test relies on assumptions on two parameters: δ and R_{max}^2 . R_{max}^2 is the hypothetical overall R^2 of the model with observable and unobservable variables. This measure indicates how much of the variation in the outcome variable can be explained by controlling for everything. δ captures the level of selection on unobservables relative to selection on observable controls. A $\delta = 1$ means that omitted variables account for the same explanatory power than observed control variables. Oster (2019) also argues that $\delta = 1$ is a reasonable assumption. The reasoning is that researchers often first focus on the most important set of controls (Angrist and Pischke, 2010). By choosing $\delta = 1$, I assume that unobservable are not more than important as the set of observables available my dataset. In addition, following the application of the test in Mian and Sufi (2014) and Ma and Hu (2022), the tests take the values $R_{max}^2 = \min(2\hat{R}_c^2, 1)$, which means that the model explains sizable variations in the use of VC (Bernstein, Korteweg and Laws, 2017; Ewens and Townsend, 2020).

I show that the adj is close to the estimated value c and that I can reject the null hypothesis

that = 0. The identified set of parameter is still quite tight at $[-0.0120, -0.0012]$ and different from 0. The results of the test are valid under the assumption that $\delta = 1$, that is that the explanatory power of the omitted variables account for the same explanatory power than observed control variables. In addition, I can push the model and show that the results hold until a limit case, that is $\delta = 1.357$ which means the omitted variables' explanatory power accounts for 136% of the observed variables' explanatory power. Given that my dataset also includes detailed information about motivations, that are rarely observed and highly correlated with the use of VC financing, the size of omitted variables bias is unlikely to be bigger than the limit case.

Overall, the Oster (2019)'s test allows me to conclude that the effect of omitted variables is fairly minimal relative to my basic and augmented set of controls and that the relation between the effects of the entrepreneur's gender on using VC remains robust. In other words, gender does not seem to be correlated with the equity funding decision only because it is a proxy for omitted startup quality or unobservable entrepreneurs' prior decisions such as applying for external funding.

[Insert table 7 here]

5. Self-selection into Entrepreneurial Strategies

5.1. Choice of the incorporation status and choice of the sector

The previous section shows that the gender gap in VC financing is more significant for highly skilled and ambitious female entrepreneurs. In this section, I take a step back and I explore whether the gender gap in the decision to incorporate and the choice of the sector is also different at this stage. At the creation stage, if highly skilled and ambitious female entrepreneurs had different growth and funding preferences than their male peers, if they were behaving according to social predictions (Akerlof and Kranton, 2000), or if they were discouraged by barriers associated with starting in a male-typed occupation (Hsieh et al., 2019; Mertz, Ronchi and Salvestrini, 2022), they would sort into a different type of business.

In table 8, I explore the choice to incorporate the new venture, as this decision is likely to reflect growth intentions of entrepreneurs (Levine and Rubinstein, 2017). The evidence shows

that female entrepreneurs are on average less likely to opt for an incorporated firm than male entrepreneurs. The average female entrepreneur would opt for a sole proprietorship. However, the interaction of the female gender with characteristics associated with a higher probability of using VC for men, reveals that serial female entrepreneurs and those who graduated from an elite school are equally to more likely to incorporate the new venture relative to their male peers (columns 1 and 2). In column 3, I find that female entrepreneurs who start with a team are 2% more likely to incorporate the new venture relative to a male-founded team. Finally, Female entrepreneurs who are high growth oriented and report that the new business is innovative are significantly more likely to incorporate the new venture relative to male founders with the same motivations (columns 5 and 6).

In appendix table 8, I also explore the choice of the sector, as it may also reflect entrepreneurs' abilities, preferences and beliefs regarding the probability of success. Specifically, I study the sorting into male-dominated sectors.²⁷ The evidence shows are on average of better quality than those who self-select into female-dominated sectors along several observable dimensions. Female entrepreneurs who are serial entrepreneurs (column 1), who graduated from an elite school (column 2), who started the new venture with co-founders (column 3), who incorporated the new business (column 4) and who have preferences for growth and innovation (column 5 and 6) are significantly more likely to start in a male-dominated sectors, as opposed to female entrepreneurs who do not share these characteristics and are more likely to start in a female-dominated sector. Female entrepreneurs with high entrepreneurial abilities and high growth oriented preferences are still less likely to start in a male-dominated sectors relative to the average male-founded startups. However, these male-dominated sectors draw a specific population of female entrepreneurs who have the profile of the average VC user.

Overall, the evidence shows that when the outcome depends only on their actions or preferences, i.e., incorporation status or choice of the sector, as opposed to funding decision, female-founded startups who meet the requirements for VC funding do not make necessarily different decisions than their male peers (Kumar, 2010; Adams and Funk, 2012; Adams and Ragunathan, 2017). Hence, under the assumption that female entrepreneurs make consistent choices along the entrepreneurship creation process, they are unlikely to hold back at the financing stage.

²⁷Male- and female-dominated sectors are classified according to the gender distribution of entrepreneurs by sector. The baseline measure defines a sector as female-dominated if more than 50% of its population of start-ups is female-led. These sectors represent 11% of the sectors at the 4-digit French SIC. I provide alternative measures of gender-dominated sectors based on the populations of CEOs, business owners and business owners at new firms.

Female entrepreneurs' profiles and the choices they make at the creation stage are unlikely to explain the gender gap in the use of VC financing.

[Insert table 8 here]

5.2. Does the self-selection into high growth entrepreneurial strategies explain the gender gap in VC financing?

I use Oaxaca-Blinder decomposition to decompose the mean difference in the use of VC financing between male and female-founded startups into two components: the "explained effect" and the "unexplained effect". The decomposition helps to identify whether the gender gap in VC financing is due to composition effects, i.e., differences in the observable characteristics of male and female entrepreneurs, and perceived effects, i.e., differences in the way that VC financing is provided to these gender groups.

I start by estimating separate OLS regressions for male (m) and female (f) entrepreneurs: $VC_m = \beta_m \dot{X}_m + \varepsilon_m$ and $VC_f = \beta_f \dot{X}_f + \varepsilon_f$, where VC_i is the use of VC financing, X is a vector of explanatory variables such as education, experience, incorporation status, and growth preferences. β is a vector of coefficients, and ε is an error term. I denote the mean values with a bar over the variables in the vector X .

Then, since OLS with a constant term produces residuals with a zero mean, I obtain: $VC_m - VC_f = \beta_m \bar{X}_m - \beta_f \bar{X}_f = \underbrace{\beta_m(\bar{X}_m - \bar{X}_f)}_{\text{Explained effect}} + \underbrace{\beta_f(\bar{X}_f - \bar{X}_f)}_{\text{Unexplained effect}}$. The first term of the equation above is the explained effect which is the impact of gender differences in the explanatory variables evaluated using the male coefficients. The second term is the unexplained effects and corresponds to the average female residual from the male wage equation. This residual is the difference between a female entrepreneur's actual use of VC with her predicted use of VC from the male equation. The unexplained effect is often taken to be an estimate of the extent of discrimination, i.e., unequal use of VC financing for equally qualified entrepreneurs (Blau and Kahn, 2017). Figure 4 plots the results and decompose each variable of the baseline model between the explained and unexplained effects (table 3, column (1)), and appendix table A4 reports the coefficients for the baseline model.

[Insert figure 4 here]

The evidence shows that about two third of the difference between male and female entrepreneurs in the use of VC, i.e, -0.0021, remains unexplained after controlling for observable differences in education, experience, sectors, incorporation status and growth preferences. The identifying assumption is that the regression model is not missing relevant unobserved predictors. The baseline model is valid if we assume that the omitted variables' explanatory power accounts for less than 136% of the observed variables' explanatory power (see section 4.5 for more discussion). Given that my dataset also includes detailed information about motivations, that are rarely observed and highly correlated with the use of VC financing, the size of omitted variables bias is unlikely to be bigger than the limit case.

The decomposition of the different co-variates shows that education, experience, team composition and preference for growth and innovation explain the explained and the unexplained effects. The fact that female entrepreneurs are less likely to have entrepreneurial experience account for a large part of the explained and unexplained difference. If we applied the coefficients estimated in the male-only regression model to female entrepreneurs, we would still find that female entrepreneurs who founded other startups have a significantly lower likelihood to use VC.

The evidence of the Oaxaca-Blinder decomposition shows that differences in the endowment (e.g., self-identifying as high-growth oriented and the incorporation status) explains 40% part of the gender gap in the use of external equity financing, but most of the gender gap remains unexplained. In particular, I show that being high-growth oriented and incorporating the startups has a higher predictive power for male entrepreneurs than female entrepreneurs, suggesting that high growth motivations are more appreciated when observed for male entrepreneurs.

6. VC financing and performance

Even after controlling for an extensive set of individual control variables, results presented in table 3 could still suffer from omitted variable bias. The gender gap in VC financing could still be explained by investors who hold rational beliefs, as opposed to biased beliefs about gender, i.e., statistical discrimination versus stereotypes. From the perspective of equity investors, it could be perfectly rational to invest in male-founded startups more often than in female-founded start-ups if male founders' true average abilities are higher than those of female founders.

To overcome these challenges, I specify an outcome test that compares the future corporate outcomes of start-ups by gender and funding status. If investors are rational and select entrepreneurs according to the true average abilities of their gender group, we should not observe any systematic gender differences in the future corporate performance of male- and female-led start-ups which use VC financing. In contrast, if female-founded startups were underfunded due to the existence of stereotypical beliefs, those female founded startups that received VC funding should outperform male-founded startups that also use VC financing, as the bar to being selected in the first place was set higher. Regarding the future corporate performance of start-ups, I use the likelihood to survive after 3 and 5 years, and growth measured in terms of sales and employment. Table 9 reports the results that compare the performance of male and female-founded startups in the same activity, sector and country. All models also include the baseline individual controls.

My results show that female-founded startups which do not use VC funding tend to underperform male-founded startups. Column (1) shows that female-founded startups' probability to survive more than three years is significantly lower than for males'. The probability to survive at five years is not significantly different for male and female-founded startups. However, the evidence shows that female entrepreneurs who use VC financing overcome their performance deficit. Female-founded startups that received VC financing are 23% more likely to still be alive after 3 years relative to male-founded startups which received VC financing (column 1).

The evidence also shows that VC-backed female founded startups' sales grow by 50% more than a comparable male-founded startups between year one to year 3 (column 3). The effect is stronger when we look at sales growth between year 1 to year 5, although only significant at 10% (column 4). Regarding growth in terms of employment, the evidence show that female-founded startups have a significantly lower employment growth relative to male-founded startups. Being VC-backed seems to have a limited positive effect on employment growth of female-founded startups (column 6).

Overall, the evidence suggests that female founded VC backed startups outperform their male counterparts in terms of survival probability and in terms of sales growth. The evidence shows that the bar was set higher when VCs selected startups to back with VC funding, which suggests that equity investors hold gender stereotypes against female entrepreneurs.

[Insert table 9 here]

7. Conclusion

This paper highlights the gender gap in VC funding, with female-founded start-ups being 45% less likely to use VC funding compared to their male counterparts. Despite controlling for various factors such as education, experience, and team composition, the gender gap remains unexplained. An analysis of omitted variable bias confirms the robustness of the gender gap in VC financing. Additionally, an outcome test shows that female-founded start-ups outperform their male counterparts, suggesting that the selection criteria for female-founded start-ups were set higher.

The study also reveals that the gender gap in VC financing is attributed to highly skilled and ambitious female entrepreneurs who start in innovative and VC-intensive sectors. The factors that increase the likelihood of male entrepreneurs to use VC funding do not have the same effect for their female counterparts. Despite sharing similar characteristics such as high education, prior entrepreneurial experience, co-founding and incorporating the new venture, and a preference for growth and innovation, female entrepreneurs are not more likely to use VC funding for their start-up. An Oaxaca-Blinder decomposition shows that differences in the return to preferences for growth and innovation account for approximately two thirds of the gender gap, indicating that successful male entrepreneurs' traits do not benefit female entrepreneurs in the same way.

Moreover, I show that highly skilled and ambitious female entrepreneurs are just as likely to incorporate their startups as their male counterparts and are more likely start in male-dominated. This suggests that when the outcome depends on their actions or preferences, such as the choice of sector or incorporation, male and female entrepreneurs do not behave differently. Furthermore, the fact that female entrepreneurs who use other financing sources are not less likely to use VC financing suggests that women who are qualified for VC funding do not have different growth and funding preferences than men, despite the different outcomes in VC funding.

In summary, this paper provides evidence of a significant gender gap in VC funding and explores potential explanations for this gap. My results suggest that the gap is not fully explained by differences in observable characteristics or preferences between male and female entrepreneurs. Instead, it appears that investors may use different selection criteria based on

gender, which may reflect gender stereotypes in the VC industry. Further research is needed to better understand the sources of discrimination that affect the VC industry and to develop policies and practices to promote gender equity in high-growth entrepreneurship and VC investment.

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Figures and Tables

Graphs

Figure 1. Gender Gaps in Entrepreneur Financing

Source: SINE survey. These figures plot the unconditional means by gender group of start-ups that use VC (figure 1a), external equity (figure 1b), bank loans (figure 1c), and public grants (figure 1d).

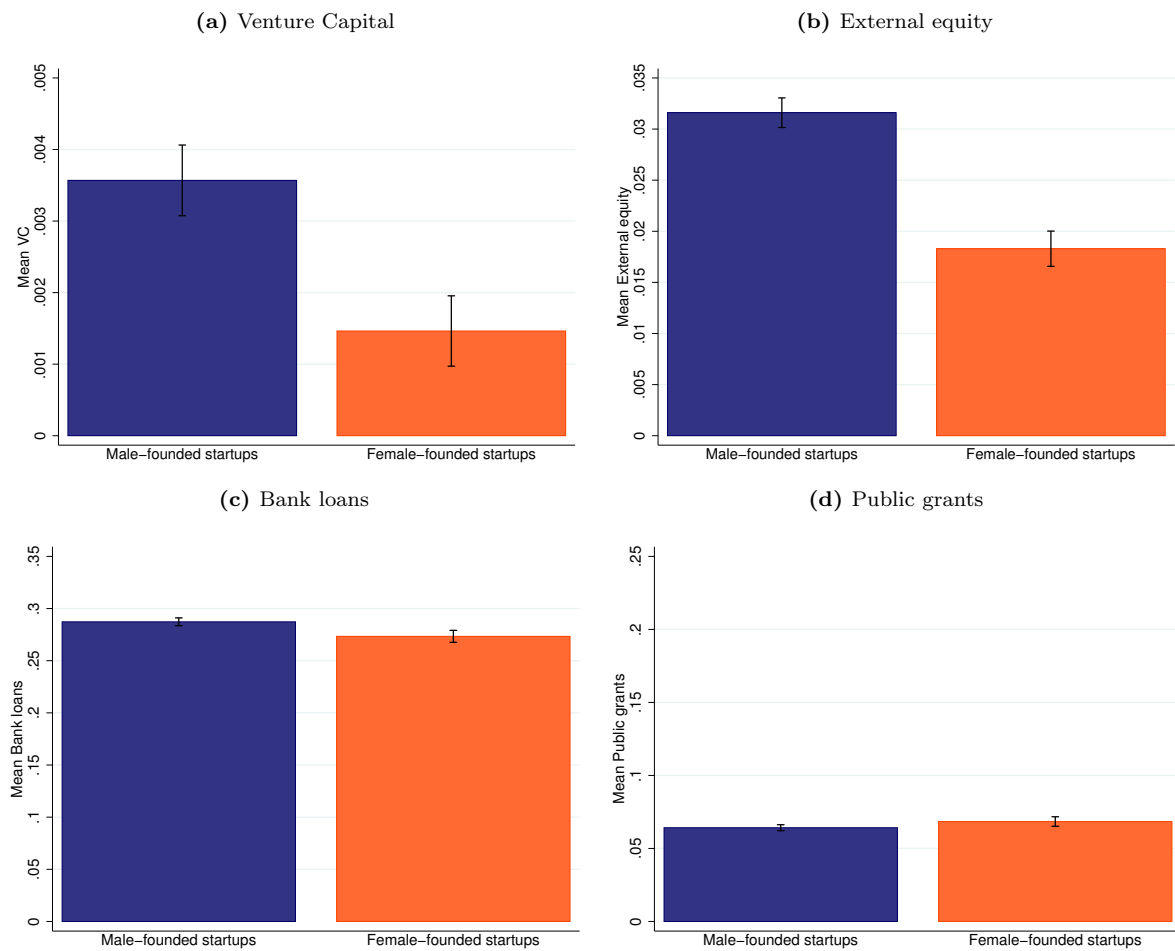


Figure 2. Gender Gaps and Sectors' Characteristics

Source: SINE survey. These figures plot the relationship between the percentage of firms that use VC (figure 2a) or bank loans (figure 2b) within a 5-digit French SIC sector and the percentage of female-founded firms within the same sector.

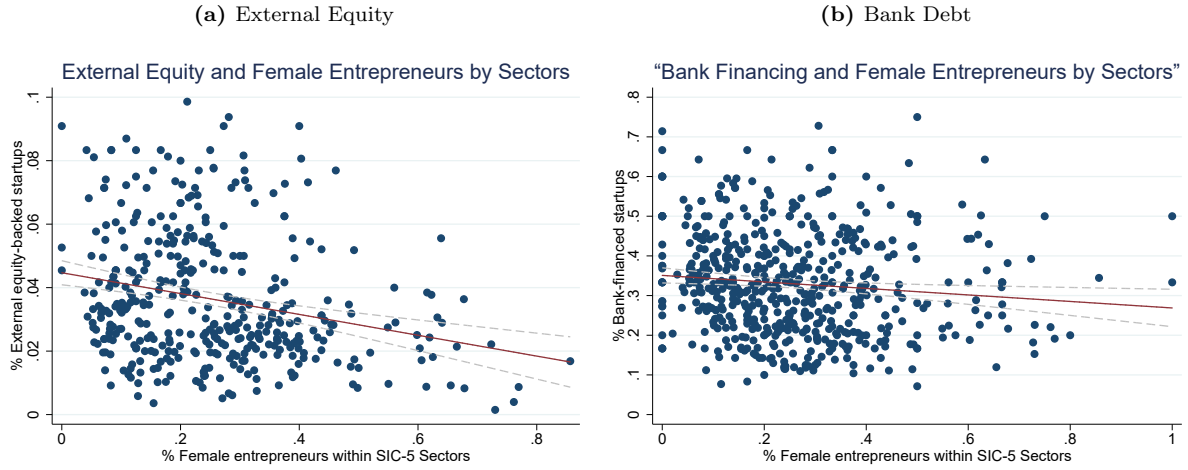
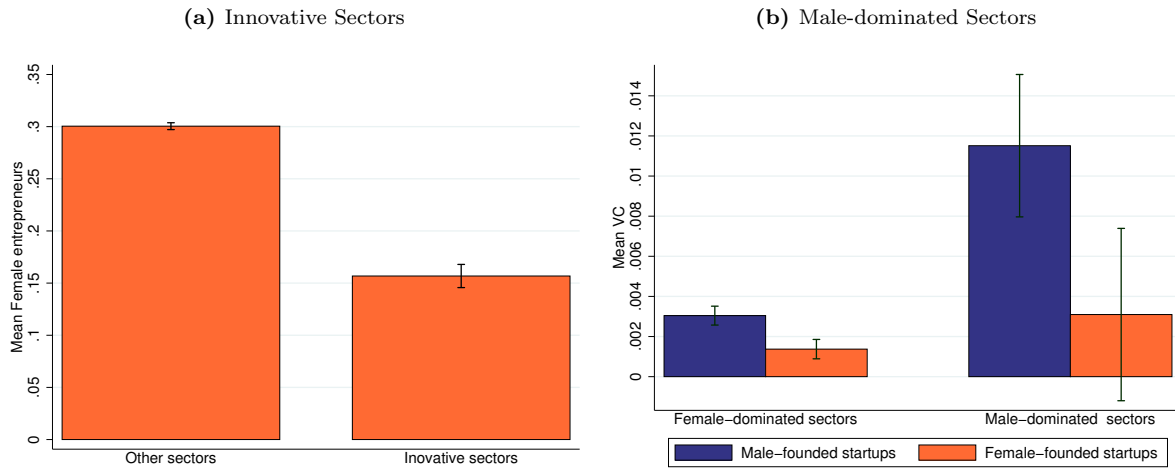


Figure 3. Gender Gap in VC Financing by Sectors

Source: SINE survey, list of innovative sectors, Firm registry. The figures plot the unconditional means of startups that use VC by gender group and by types of 5-digit French SIC sectors in which the start-up operates. In figure 3a, we compare innovative sectors and other sectors. Innovative sectors are defined by the French Statistical Institute. In figure 3b, we compare male- and female-dominated sectors. A female-dominated sector includes at least 50% of new female-founded start-ups within a 5-digit French SIC sector.



Descriptive statistics

Financing and the gender gap

Table 1. Male and Female-Founded Start-ups by Cohort and Characteristics

Source: SINE survey and tax files. Panel A reports number and percentage of male and female-founded start-ups in 2002, 2006, 2010, 2014 and 2018. Panel B reports the percentage of a given characteristics in the population, among male-founded startups, and among female-founded startups *Sample:* New firms founded in 2010, 2014, and 2018.

| Panel A: | | | | | | |
|----------------------|---------------|---------------|---------------|---------------|---------------|----------------|
| | 2002 | 2006 | Cohort | | | Total |
| | | | 2010 | 2014 | 2018 | |
| Male entrepreneurs | 16,008 | 22,050 | 24,342 | 21,052 | 10,651 | 94,103 |
| % | 72.44 | 71.30 | 71.68 | 69.75 | 70.37 | 71.13 |
| Female entrepreneurs | 6,091 | 8,876 | 9,619 | 9,128 | 4,484 | 38,198 |
| % | 27.56 | 28.70 | 28.32 | 30.25 | 29.63 | 28.87 |
| Total | 22,099 | 30,926 | 33,961 | 30,180 | 15,135 | 132,301 |

| Panel B: | | | | | | |
|------------------------------|--------------|--------------------------|----------------------------|-------|---------|-------|
| Characteristics | % Population | % Male & Characteristics | % Female & Characteristics | 2010 | Cohorts | |
| | | | | | 2014 | 2018 |
| All | 100 | 70.7 | 29.30 | 28.32 | 30.25 | 29.63 |
| Incorporated startup | 61.64 | 75.63 | 24.37 | 24.62 | 23.35 | 25.51 |
| High growth oriented | 34.02 | 76.4 | 23.60 | 23.79 | 23.74 | 22.97 |
| Preference for independence | 60.52 | 70.48 | 29.52 | 28.66 | 30.62 | 29.42 |
| Difficulty getting financing | 21.43 | 73.56 | 26.44 | 25.73 | 27.32 | 26.3 |
| Innovative business | 46.47 | 69.98 | 30.02 | 29.13 | 30.7 | 30.49 |
| Serial entrepreneur | 30.13 | 78.19 | 21.81 | 21.83 | 22.26 | 21.05 |
| Started with co-founders | 25.49 | 71.23 | 28.77 | 28.28 | 29.33 | 28.88 |
| Paris-based | 13.89 | 72.35 | 27.65 | 27.39 | 27.38 | 28.4 |
| Male-dominated sector | 78.9 | 78.17 | 21.83 | 22.48 | 21.26 | 21.38 |
| Innovative sector | 5.2 | 84.3 | 15.70 | 18.65 | 14.1 | 13.5 |
| External financing | 41.46 | 70.48 | 29.52 | 29.34 | 29.42 | 30.32 |
| VC | 0.3 | 85.47 | 14.53 | 10.19 | 7.23 | 39.53 |
| External equity | 2.77 | 80.65 | 19.35 | 18.6 | 18.5 | 22.34 |
| Public grants | 6.55 | 69.36 | 30.64 | 29.27 | 32.69 | 32.69 |
| Bank loans | 28.32 | 71.72 | 28.28 | 28.14 | 27.79 | 29.61 |
| Personal debt | 10.05 | 67.47 | 32.53 | 33.25 | 31.72 | 31.67 |
| Other loans | 8.12 | 66.53 | 33.47 | 32.88 | 33.51 | 35.26 |
| Microcredit & crowdfunding | 1.65 | 63.64 | 36.36 | 32.62 | 37.14 | 41.59 |

Table 2. Entrepreneurs' and Start-ups' Characteristics

Source: SINE survey and tax files. *Sample:* New firms founded in 2010, 2014, and 2018. The table presents entrepreneurs' biographical characteristics (panel A), growth preferences (panel B), startups' characteristics including financing and income sources (panel C), start-up's performance and size (panel D), sectors' characteristics. The mean and number of observations by gender group are reported as are t-statistics and p-values of the mean differences between male and female entrepreneurs. Variable definitions and data sources are provided in Appendix ??.

| Variables | All | Male | | Female | | difference | t-stat |
|--|-------|-------|-------|--------|-------|------------|----------|
| | Mean | N | Mean | N | Mean | | |
| Panel A. Biographical characteristics and experience | | | | | | | |
| Age \geq 40 | 0.483 | 56045 | 0.504 | 23231 | 0.432 | 0.07*** | (18.68) |
| French national | 0.917 | 56045 | 0.910 | 23231 | 0.932 | -0.02*** | (-10.44) |
| <u>Education:</u> | | | | | | | |
| No degree | 0.163 | 56045 | 0.182 | 23231 | 0.116 | 0.07*** | (25.06) |
| High school | 0.393 | 56045 | 0.412 | 23231 | 0.345 | 0.07*** | (18.03) |
| Undergraduate | 0.160 | 56045 | 0.142 | 23231 | 0.204 | -0.06*** | (-20.28) |
| Graduate | 0.284 | 56045 | 0.263 | 23231 | 0.335 | -0.07*** | (-20.16) |
| Elite school | 0.059 | 56045 | 0.068 | 23231 | 0.036 | 0.03*** | (20.11) |
| <u>Experience:</u> | | | | | | | |
| Industry expert | 0.690 | 56045 | 0.722 | 23231 | 0.613 | 0.11*** | (29.31) |
| Industry experience \geq 10 years | 0.405 | 56045 | 0.444 | 23231 | 0.312 | 0.13*** | (35.75) |
| Serial entrepreneur | 0.301 | 56045 | 0.333 | 23231 | 0.224 | 0.11*** | (32.22) |
| Serial entrepreneur \geq 3 startups | 0.028 | 56045 | 0.035 | 23231 | 0.011 | 0.02*** | (23.39) |
| Previously CEO | 0.079 | 56045 | 0.096 | 23231 | 0.036 | 0.06*** | (34.25) |
| Previously self-employed | 0.162 | 56045 | 0.175 | 23231 | 0.129 | 0.05*** | (16.99) |
| Previously employee | 0.344 | 56045 | 0.338 | 23231 | 0.358 | -0.02*** | (-5.15) |
| Previously unemployed | 0.380 | 56045 | 0.364 | 23231 | 0.416 | -0.05*** | (-13.48) |
| Previously student | 0.036 | 56045 | 0.025 | 23231 | 0.061 | -0.04*** | (-20.87) |
| <u>Family:</u> | | | | | | | |
| Children | 0.548 | 31703 | 0.542 | 13612 | 0.560 | -0.02*** | (-3.59) |
| Married | 0.702 | 56045 | 0.714 | 23231 | 0.672 | 0.04*** | (11.71) |
| Entrepreneurial family | 0.695 | 56045 | 0.694 | 23231 | 0.698 | -0.00 | (-1.22) |
| Help from family | 0.371 | 45394 | 0.330 | 18747 | 0.468 | -0.14*** | (-32.37) |
| Help from business partners | 0.119 | 56045 | 0.117 | 23231 | 0.125 | -0.01*** | (-3.32) |
| Help from specialists | 0.446 | 45394 | 0.439 | 18747 | 0.462 | -0.02*** | (-5.40) |
| No external help | 0.315 | 56045 | 0.341 | 23231 | 0.253 | 0.09*** | (25.13) |

Entrepreneurs' and Start-ups' Characteristics
(Continued)

| Variables | All | Male | | Female | | difference | t-stat |
|---|-------|-------|-------|--------|-------|------------|----------|
| | Mean | N | Mean | N | Mean | | |
| Panel B: Entrepreneurs' growth preferences | | | | | | | |
| Incorporated | 0.616 | 56045 | 0.659 | 23231 | 0.513 | 0.15*** | (38.25) |
| High-growth oriented | 0.340 | 56045 | 0.368 | 23231 | 0.274 | 0.09*** | (26.28) |
| <u>Detailed motivations for entry:</u> | | | | | | | |
| Independent | 0.605 | 56045 | 0.603 | 23231 | 0.610 | -0.01* | (-1.69) |
| Taste | 0.430 | 56045 | 0.442 | 23231 | 0.400 | 0.04*** | (10.79) |
| Opportunity | 0.188 | 56045 | 0.180 | 23231 | 0.206 | -0.03*** | (-8.53) |
| New Idea | 0.154 | 56045 | 0.155 | 23231 | 0.153 | 0.00 | (0.84) |
| Successful peer | 0.098 | 56045 | 0.098 | 23231 | 0.098 | -0.00 | (-0.15) |
| Unemployed, choice | 0.206 | 56045 | 0.197 | 23231 | 0.225 | -0.03*** | (-8.69) |
| Other reasons | 0.318 | 56045 | 0.315 | 23231 | 0.327 | -0.01*** | (-3.48) |
| Panel C: Startups' characteristics | | | | | | | |
| <u>Team :</u> | | | | | | | |
| Co-founder(s) | 0.255 | 56045 | 0.257 | 23231 | 0.250 | 0.01* | (1.94) |
| Founded with spouse | 0.087 | 56045 | 0.081 | 23231 | 0.100 | -0.02*** | (-8.06) |
| Founded with family | 0.042 | 56045 | 0.042 | 23231 | 0.040 | 0.00 | (1.06) |
| Founded with business partners | 0.136 | 56045 | 0.142 | 23231 | 0.120 | 0.02*** | (8.27) |
| <u>Innovation:</u> | | | | | | | |
| Innovative business | 0.465 | 56045 | 0.460 | 23231 | 0.476 | -0.02*** | (-4.14) |
| Product innovation | 0.393 | 56045 | 0.385 | 23231 | 0.411 | -0.03*** | (-6.76) |
| Production innovation | 0.104 | 56045 | 0.113 | 23231 | 0.084 | 0.03*** | (12.99) |
| Marketing innovation | 0.128 | 56045 | 0.129 | 23231 | 0.124 | 0.00* | (1.86) |
| Organization innovation | 0.158 | 45394 | 0.165 | 18747 | 0.142 | 0.02*** | (7.52) |
| Innovative sector | 0.052 | 56045 | 0.062 | 23231 | 0.028 | 0.03*** | (23.00) |
| <u>Business model:</u> | | | | | | | |
| B2B business | 0.395 | 56045 | 0.440 | 23231 | 0.284 | 0.16*** | (42.93) |
| Local customers | 0.584 | 56045 | 0.542 | 23231 | 0.685 | -0.14*** | (-38.39) |
| Domestic customers | 0.364 | 56045 | 0.402 | 23231 | 0.274 | 0.13*** | (35.71) |
| International customers | 0.052 | 56045 | 0.056 | 23231 | 0.042 | 0.01*** | (8.72) |
| 1 or 2 customers | 0.147 | 56045 | 0.160 | 23231 | 0.118 | 0.04*** | (15.88) |
| 3 to 10 customers | 0.262 | 56045 | 0.278 | 23231 | 0.223 | 0.05*** | (16.48) |
| Many customers | 0.457 | 56045 | 0.425 | 23231 | 0.533 | -0.11*** | (-27.73) |
| Many customers, a few big ones | 0.134 | 56045 | 0.137 | 23231 | 0.126 | 0.01*** | (4.32) |
| Panel D: Sector's characteristics | | | | | | | |
| Male-dominated sector | 0.789 | 56053 | 0.872 | 23228 | 0.588 | 0.28*** | (80.80) |
| Male-dominated sector (continuous) | 0.681 | 55942 | 0.746 | 23210 | 0.522 | 0.22*** | (109.73) |
| N. VC deals within sector | 1.307 | 55992 | 1.362 | 23211 | 1.174 | 0.19*** | (13.81) |
| Herfindhal index | 0.028 | 56053 | 0.031 | 23228 | 0.021 | 0.01*** | (15.45) |
| Concentrated sector (Top quintile Herfindhal index) | 0.186 | 56053 | 0.193 | 23228 | 0.169 | 0.02*** | (8.01) |
| Competitive sector (Bottom quintile Herfindhal index) | 0.221 | 56053 | 0.187 | 23228 | 0.302 | -0.11*** | (-33.42) |
| Profit margin sector | 0.065 | 45402 | 0.047 | 18744 | 0.108 | -0.06*** | (-6.57) |
| High profit margin sector (Top quintile) | 0.154 | 56053 | 0.123 | 23228 | 0.228 | -0.10*** | (-34.01) |

Entrepreneurs' and Start-ups' Characteristics
(Continued)

| Variables | All | Male | | Female | | difference | t-stat |
|---|--------|-------|--------|--------|--------|------------|----------|
| | Mean | N | Mean | N | Mean | | |
| Panel E. Financing sources | | | | | | | |
| External financing | 0.415 | 56045 | 0.413 | 23231 | 0.418 | -0.00 | (-1.13) |
| VC | 0.003 | 56045 | 0.004 | 23231 | 0.001 | 0.00*** | (5.92) |
| Business equity | 0.025 | 56045 | 0.029 | 23231 | 0.017 | 0.01*** | (10.42) |
| External equity | 0.028 | 56045 | 0.032 | 23231 | 0.018 | 0.01*** | (11.58) |
| Bank loan | 0.283 | 56045 | 0.287 | 23231 | 0.273 | 0.01*** | (4.00) |
| Personal loan | 0.101 | 56045 | 0.096 | 23231 | 0.112 | -0.02*** | (-6.49) |
| Crowdfunding and Microcredit | 0.017 | 56045 | 0.015 | 23231 | 0.020 | -0.01*** | (-5.30) |
| Other loans | 0.081 | 56045 | 0.076 | 23231 | 0.093 | -0.02*** | (-7.39) |
| Public grant | 0.065 | 56045 | 0.064 | 23231 | 0.068 | -0.00** | (-2.16) |
| Startup capital: | | | | | | | |
| Starting Capital <2k | 0.252 | 56045 | 0.231 | 23231 | 0.302 | -0.07*** | (-20.28) |
| Starting Capital ≥2k – <4k | 0.258 | 56045 | 0.263 | 23231 | 0.248 | 0.01*** | (4.24) |
| Starting Capital ≥4k – <8k | 0.158 | 56045 | 0.165 | 23231 | 0.142 | 0.02*** | (8.25) |
| Starting Capital ≥8k – <16k | 0.161 | 56045 | 0.165 | 23231 | 0.151 | 0.01*** | (5.14) |
| Starting Capital ≥16k – <40k | 0.074 | 56045 | 0.075 | 23231 | 0.073 | 0.00 | (0.77) |
| Starting Capital ≥40k – <80k | 0.046 | 56045 | 0.046 | 23231 | 0.045 | 0.00 | (0.87) |
| Starting Capital ≥160k | 0.050 | 56045 | 0.055 | 23231 | 0.039 | 0.02*** | (10.23) |
| Spouse income | 0.282 | 31794 | 0.276 | 12793 | 0.295 | -0.02*** | (-4.06) |
| Other employment income | 0.182 | 31794 | 0.186 | 12793 | 0.173 | 0.01*** | (3.13) |
| Other income (benefits) | 0.123 | 31794 | 0.127 | 12793 | 0.113 | 0.01*** | (4.08) |
| No other income | 0.491 | 31794 | 0.491 | 12793 | 0.489 | 0.00 | (0.55) |
| Personal resources | 62.295 | 24355 | 62.814 | 9615 | 60.981 | 1.83*** | (3.73) |
| Bank loans | 30.377 | 24355 | 29.933 | 9615 | 31.502 | -1.57*** | (-3.47) |
| Other financing | 7.328 | 24355 | 7.253 | 9615 | 7.518 | -0.26 | (-1.15) |
| Panel E. Startups' performance | | | | | | | |
| Survival ≥3 years | 0.594 | 56045 | 0.599 | 23231 | 0.582 | 0.02*** | (4.32) |
| Survival ≥5 years | 0.243 | 56045 | 0.248 | 23231 | 0.233 | 0.01*** | (4.32) |
| Employment size: | | | | | | | |
| Zero | 0.796 | 56045 | 0.785 | 23231 | 0.825 | -0.04*** | (-13.14) |
| 1 | 0.098 | 56045 | 0.102 | 23231 | 0.088 | 0.01*** | (6.19) |
| 2 | 0.044 | 56045 | 0.046 | 23231 | 0.038 | 0.01*** | (5.26) |
| 3 | 0.021 | 56045 | 0.023 | 23231 | 0.018 | 0.01*** | (4.84) |
| 3 | 0.021 | 56045 | 0.023 | 23231 | 0.018 | 0.01*** | (4.84) |
| 4-5 | 0.020 | 56045 | 0.022 | 23231 | 0.016 | 0.01*** | (6.46) |
| 6-10 | 0.014 | 56045 | 0.015 | 23231 | 0.011 | 0.00*** | (5.61) |
| 11+ | 0.007 | 56045 | 0.007 | 23231 | 0.006 | 0.00** | (2.25) |
| Panel F. Reported difficulties at start | | | | | | | |
| No difficulty | 0.224 | 56045 | 0.228 | 23231 | 0.214 | 0.01*** | (4.26) |
| Getting fundings | 0.214 | 56045 | 0.223 | 23231 | 0.193 | 0.03*** | (9.47) |
| Bank overdraft | 0.078 | 56045 | 0.081 | 23231 | 0.071 | 0.01*** | (5.13) |
| Open bank account | 0.067 | 56045 | 0.069 | 23231 | 0.063 | 0.01*** | (3.34) |
| Hiring skilled workers | 0.096 | 56045 | 0.105 | 23231 | 0.076 | 0.03*** | (13.27) |
| Pricing products | 0.164 | 56045 | 0.160 | 23231 | 0.173 | -0.01*** | (-4.65) |
| Finding location | 0.114 | 56045 | 0.105 | 23231 | 0.136 | -0.03*** | (-12.03) |
| Finding clients | 0.197 | 56045 | 0.189 | 23231 | 0.216 | -0.03*** | (-8.66) |
| Administrative tasks | 0.402 | 56045 | 0.396 | 23231 | 0.417 | -0.02*** | (-5.44) |
| Being alone | 0.164 | 56045 | 0.164 | 23231 | 0.165 | -0.00 | (-0.09) |

Table 3. Gender Gap in Entrepreneurial Financing

Source: SINE survey and tax files. Sample: New firms founded in 2010, 2014, and 2018. This table uses OLS to analyze the effect of gender on the use of different funding sources. The dependent variables are as follows: *VC* (column 1), *External equity* financing including VC (columns 2), *External financing* any kind (column 3), use of *Public grants* (column 4), *Bank debt* financing (column 5), use of *Personal bank debt* (column 6), and *Microcredit* (column 7), and use of *Other loans* (column 8). *Female* is a dummy variable that is equal to 1 if the start-up is run by a woman. The human capital controls include the following dummy variables: *Undergraduate*, *Graduate*, and *Elite school* which respectively equal one if the entrepreneur has at least a three-year or at least a five-year university degree, or/and graduate from an elite engineering or business school. *Expert*, which equals one if the entrepreneur has at least three years of work experience in the sector, and *Serial*, which equals one if the entrepreneur has previously founded another start-up. *Incorporate* equals one if the the startup is incorporated as opposed to a sole-proprietorship. *High-growth oriented* equals one if the entrepreneur’s main ambition is to grow the start as opposed to be self-employed. *Innovative business* equals one if the entrepreneur reports any sort of innovation in his business model. All models include county and 5-digit SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector-level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

| Dependent variable: | External equity | | All external | Public | Bank loans | | Other loans | |
|--------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | VC (1) | All types (2) | Financing (3) | Grants (4) | Corporate debt (5) | Personal debt (6) | Microcredit (7) | Other (8) |
| Female | -0.0012*** (0.000) | -0.0075*** (0.001) | 0.0145* (0.007) | 0.0036 (0.003) | 0.0025 (0.006) | 0.0084*** (0.003) | 0.0042*** (0.001) | 0.0201*** (0.003) |
| Age \geq 40 | 0.0005 (0.000) | 0.0033*** (0.001) | -0.0289*** (0.005) | -0.0000 (0.002) | -0.0375*** (0.004) | 0.0017 (0.003) | -0.0008 (0.001) | -0.0156*** (0.002) |
| French national | 0.0008 (0.001) | 0.0043** (0.002) | 0.1372*** (0.008) | 0.0226*** (0.003) | 0.1309*** (0.007) | 0.0289*** (0.004) | -0.0065*** (0.002) | 0.0269*** (0.004) |
| Undergraduate | -0.0018*** (0.000) | 0.0038* (0.002) | 0.0108 (0.007) | 0.0022 (0.003) | 0.0155** (0.007) | 0.0034 (0.003) | -0.0008 (0.001) | 0.0095** (0.004) |
| Graduate | 0.0015** (0.001) | 0.0074*** (0.002) | -0.0279*** (0.006) | 0.0010 (0.003) | -0.0142** (0.006) | -0.0107*** (0.003) | -0.0032** (0.001) | 0.0032 (0.003) |
| Grande ecole | 0.0085*** (0.002) | 0.0171*** (0.004) | -0.0254*** (0.009) | 0.0065 (0.004) | -0.0445*** (0.007) | -0.0095* (0.005) | 0.0018 (0.002) | 0.0021 (0.005) |
| Industry expert | -0.0012** (0.000) | 0.0014 (0.001) | 0.0338*** (0.007) | -0.0068*** (0.002) | 0.0377*** (0.006) | 0.0037 (0.003) | -0.0039*** (0.001) | 0.0127*** (0.003) |
| Serial entrepreneur | 0.0015*** (0.000) | 0.0139*** (0.001) | -0.0383*** (0.006) | -0.0254*** (0.002) | -0.0289*** (0.005) | -0.0043* (0.002) | -0.0030*** (0.001) | -0.0310*** (0.002) |
| Co-founder(s) | 0.0032*** (0.001) | 0.0173*** (0.002) | 0.0280*** (0.005) | -0.0083*** (0.002) | 0.0382*** (0.006) | -0.0054* (0.003) | -0.0042*** (0.001) | -0.0026 (0.003) |
| Incorporated | 0.0006 (0.000) | 0.0089*** (0.002) | 0.0393*** (0.007) | -0.0188*** (0.002) | 0.0984*** (0.008) | -0.0285*** (0.004) | -0.0100*** (0.001) | 0.0131*** (0.003) |
| High-growth oriented | 0.0027*** (0.001) | 0.0188*** (0.002) | 0.0519*** (0.005) | 0.0006 (0.002) | 0.0350*** (0.005) | 0.0086*** (0.003) | 0.0029*** (0.001) | 0.0110*** (0.003) |
| Innovative business | 0.0022*** (0.000) | 0.0060*** (0.001) | 0.0658*** (0.004) | 0.0270*** (0.002) | 0.0373*** (0.004) | 0.0251*** (0.002) | 0.0067*** (0.001) | 0.0264*** (0.003) |
| SIC-5 Sector \times Cohort-year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| R ² | 0.030 | 0.041 | 0.123 | 0.045 | 0.115 | 0.040 | 0.035 | 0.044 |
| N | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 |
| Mean dep. var. | 0.0030 | 0.0277 | 0.4146 | 0.0655 | 0.2832 | 0.1005 | 0.0165 | 0.0812 |

Table 4. Gender Gap in VC Financing and High-Growth Preferences

Source: SINE survey. *Sample:* New firms founded in 2010, 2014, and 2018. This table uses OLS to test whether entrepreneurs' individual characteristics mitigates or exacerbates the effect of gender on the use of VC. The dependent variable is a dummy variable that is equal to one if the startup uses VC. All models include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. They also include county and 5-digit French SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

| Dependent variable | 1(VC) | | | | | |
|--------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Female | -0.0007 (0.000) | -0.0005 (0.000) | -0.0004 (0.000) | -0.0006 (0.000) | 0.0001 (0.000) | -0.0003 (0.000) |
| Female \times Serial entrepreneur | -0.0019** (0.001) | | | | | |
| Female \times Co-founder(s) | | -0.0025** (0.001) | | | | |
| Female \times Incorporated | | | -0.0014** (0.001) | | | |
| Female \times High-growth | | | | -0.0018* (0.001) | | |
| Female \times Innovative business | | | | | -0.0028*** (0.001) | |
| Female \times Difficulty financing | | | | | | -0.0041*** (0.001) |
| Difficulties - Getting fundings | | | | | | 0.0046*** (0.001) |
| Age \geq 40 | 0.0005 (0.000) | 0.0005 (0.000) | 0.0006 (0.000) | 0.0005 (0.000) | 0.0005 (0.000) | 0.0006 (0.000) |
| French national | 0.0008 (0.001) | 0.0008 (0.001) | 0.0008 (0.001) | 0.0008 (0.001) | 0.0008 (0.001) | 0.0009 (0.001) |
| Undergraduate | -0.0018*** (0.000) | -0.0018*** (0.000) | -0.0018*** (0.000) | -0.0018*** (0.000) | -0.0018*** (0.000) | -0.0018*** (0.000) |
| Graduate | 0.0015** (0.001) | 0.0015** (0.001) | 0.0015** (0.001) | 0.0015** (0.001) | 0.0015** (0.001) | 0.0016*** (0.001) |
| Grande ecole | 0.0085*** (0.002) | 0.0085*** (0.002) | 0.0084*** (0.002) | 0.0084*** (0.002) | 0.0085*** (0.002) | 0.0085*** (0.002) |
| Industry expert | -0.0012** (0.000) | -0.0012** (0.000) | -0.0012** (0.000) | -0.0012** (0.000) | -0.0012** (0.000) | -0.0011** (0.000) |
| Serial entrepreneur | 0.0020*** (0.001) | 0.0015*** (0.000) | 0.0015*** (0.000) | 0.0015*** (0.000) | 0.0015*** (0.000) | 0.0015*** (0.000) |
| Co-founder(s) | 0.0032*** (0.001) | 0.0039*** (0.001) | 0.0032*** (0.001) | 0.0032*** (0.001) | 0.0032*** (0.001) | 0.0031*** (0.001) |
| Incorporated | 0.0006 (0.000) | 0.0007 (0.000) | 0.0011** (0.000) | 0.0007 (0.000) | 0.0006 (0.000) | 0.0006 (0.000) |
| High-growth oriented | 0.0026*** (0.001) | 0.0026*** (0.000) | 0.0027*** (0.001) | 0.0031*** (0.001) | 0.0026*** (0.000) | 0.0024*** (0.000) |
| Innovative business | 0.0022*** (0.000) | 0.0022*** (0.000) | 0.0022*** (0.000) | 0.0022*** (0.000) | 0.0030*** (0.001) | 0.0020*** (0.000) |
| Other controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Sector \times Cohort FE | Yes | Yes | Yes | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes | Yes | Yes | Yes |
| R ² | 0.030 | 0.031 | 0.030 | 0.030 | 0.031 | 0.031 |
| N | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 |
| Mean Dep. Var. | 0.0030 | 0.0030 | 0.0030 | 0.0030 | 0.0030 | 0.0030 |

Table 5. Gender VC Funding Gap and Sectors' Characteristics

Source: SINE survey, Firm registry, Tax files. *Sample:* New firms founded in 2010, 2014, and 2018. This table uses OLS to test the effects of sectors' characteristics on entrepreneurs use of VC by gender. The dependent variable is a dummy variable that is equal to one if the startup uses VC. The main independent variables are the entrepreneur's gender, *Female*, interacted with 5digit SIC sectors' characteristics, including male-dominated sector, Innovative sector, Number of VC deals in the sector, product market concentration and competition, and the sector's profit margins. All models include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. They also include county and 5-digit French SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

| Dependent variable | 1(VC) | | | | | |
|---|---------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Female | -0.0001 (0.001) | -0.0009** (0.000) | -0.0006 (0.000) | -0.0006 (0.000) | -0.0016*** (0.000) | -0.0017*** (0.000) |
| Female \times Male-dominated sector | -0.0015* (0.001) | | | | | |
| Female \times Innovative sector | | -0.0073*** (0.002) | | | | |
| Female \times N. VC deals within sector | | | -0.0005** (0.000) | | | |
| Female \times Concentrated sector (Top quintile Herfindhal) | | | | -0.0031*** (0.001) | | |
| Female \times Competitive sector (Bottom quintile Herfindhal) | | | | | 0.0017** (0.001) | |
| Female \times High profit margin sector (Top quintile) | | | | | | 0.0024*** (0.001) |
| Other controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Sector \times Cohort FE | Yes | Yes | Yes | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes | Yes | Yes | Yes |
| R ² | 0.030 | 0.031 | 0.030 | 0.031 | 0.030 | 0.030 |
| N | 79,276 | 79,276 | 79,201 | 79,276 | 79,276 | 79,276 |
| Mean Dep. Var. | 0.0030 | 0.0030 | 0.0029 | 0.0030 | 0.0030 | 0.0030 |

Table 6. VC Financing and the Share of Equity, Debt and Personal Resources

Source: SINE survey. *Sample:* New firms founded in 2010, 2014, and 2018. This table uses OLS to study the relationship between capital structure and the use of VC. The dependent variables are the percentage of other financing (column 1), the percentage of personal resources (column 2), and the the percentage of bank loans (column 3), in the the startup's capital structure at the end of the first year of operation. The main independent variables are the entrepreneur's gender, *Female*, interacted with the use of *VC*. All models include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. They also include county and 5-digit French SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

| Dependent variable: | % Other financing (1) | % Inside equity (2) | % Bank loans (3) |
|---------------------------|--------------------------|------------------------|---------------------|
| Female | 0.19 (0.28) | -1.59** (0.73) | 1.39* (0.72) |
| VC | 30.69*** (3.38) | -28.34*** (3.36) | -2.35 (2.84) |
| Female \times VC | -22.78*** (5.16) | 9.66 (9.93) | 13.12 (9.25) |
| Age \geq 40 | 0.41* (0.23) | 2.51*** (0.63) | -2.92*** (0.61) |
| French national | 0.80 (0.49) | -11.45*** (1.00) | 10.65*** (0.82) |
| Undergraduate | -0.08 (0.34) | -0.69 (0.72) | 0.77 (0.65) |
| Graduate | -0.26 (0.30) | 3.31*** (0.68) | -3.06*** (0.64) |
| Grande ecole | 1.70*** (0.59) | 1.87 (1.14) | -3.57*** (0.92) |
| Industry expert | -0.34 (0.23) | -1.40** (0.67) | 1.74*** (0.65) |
| Serial entrepreneur | -1.91*** (0.25) | 4.30*** (0.62) | -2.39*** (0.52) |
| Co-founder(s) | -0.83*** (0.23) | -0.04 (0.48) | 0.88* (0.45) |
| Innovative business | 1.43*** (0.23) | -2.71*** (0.49) | 1.28*** (0.42) |
| High-growth oriented | 0.74*** (0.22) | -1.78*** (0.50) | 1.04** (0.49) |
| Incorporated | -2.28*** (0.31) | 0.56 (0.67) | 1.72*** (0.66) |
| Tangible/total assets t=0 | 0.61 (0.55) | -13.88*** (1.36) | 13.28*** (1.27) |
| Log(total assets) t=0 | 0.23*** (0.08) | -1.19*** (0.22) | 0.96*** (0.21) |
| Sector \times Cohort FE | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes |
| R ² | 0.035 | 0.066 | 0.067 |
| N | 30,950 | 30,950 | 30,950 |
| Mean Dep. Var. | 7.46 | 61.96 | 30.59 |

Table 7. Omitted Variables and Oster’s Test

Source: SINE survey and tax files. *Sample:* New firms founded in 2010, 2014, and 2018. This table tests the role of omitted and unobservable control variables in explaining the relation between gender and the use of VC funding. Panel A uses OLS to test the robustness of the model to including additional control variables. I estimate the following linear model $I(VC) = X + \delta_{FE} + \text{varepsilon}$ without any control variables though which I obtain β_u and R_u^2 (column 1), then with the baseline control variables and fixed effects (columns 2 and 3), and then with the additional control variables (columns 4, 5, 6). The dependent variable is VC financing which takes the value one if the entrepreneur uses VC financing. The main independent variable is the entrepreneur’s gender, *Female*. All models from column 2 and onward include the baseline fixed effects: county and 5-digit French SIC sector \times cohort-year fixed effects. All models from column 3 and onward include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. Models in column 4 include additional control variables: the business model variables, including the B2B/B2C model and geographic and width of the customer base (column 4), the other financing and income sources (column 5), and the categories of starting capital (column 6). Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

Panel B implements the test designed by Oster (2019) to assess the robustness of the baseline model (panel A column 3 and panel B-1) and the augmented model (panel A column 6 and panel B-2) to the omitted variable bias. For any given combination δ and R_{max}^2 , Oster (2019) defines the bias-adjusted coefficient, denoted as β_{adj} that is determined by parameters δ and R_{max}^2 and given by the following equation: $\beta_{adj} = \beta_c - \delta \frac{(\beta_u - \beta_c)(R_{max}^2 - R_u^2)}{R_c^2 - R_u^2}$. I assume that $\delta = 1$, which means that omitted variables account for the same explanatory power than observed control variables, and that $R_{max}^2 = \min(2R_c^2, 1)$, which means that the model explains sizable variations in the use of VC. Panel B-1 and B-2 report the adjusted coefficient β_{adj} , the recommended identified set is the interval between β_{adj} and β_c , and whether the identified set rejects the null of $\beta = 0$ and the δ value to make R_{max}^2 reach zero.

Panel A: Baseline and augmented models

| Dependent variable: | I(VC) | | | | | |
|--------------------------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|------------------------------|
| | Unrestricted | | Restricted | | | |
| Model: | None | Fixed effects | Baseline + motivations | + Business model | + Other financing | + Starting capital situation |
| Controls: | (1) | (2) | (3) | (4) | (5) | (6) |
| Female | -0.0021*** (0.000) | -0.0017*** (0.000) | -0.0012*** (0.000) | -0.0012*** (0.000) | -0.0013*** (0.000) | -0.0011*** (0.000) |
| SIC-5 Sector \times Cohort-year FE | No | Yes | Yes | Yes | Yes | Yes |
| County FE | No | Yes | Yes | Yes | Yes | Yes |
| Human capital | No | No | Yes | Yes | Yes | Yes |
| Startup characteristics | No | No | Yes | Yes | Yes | Yes |
| High-growth preference | No | No | Yes | Yes | Yes | Yes |
| Other motivations | No | No | Yes | Yes | Yes | Yes |
| Business model | No | No | No | Yes | Yes | Yes |
| Other financing sources | No | No | No | No | Yes | Yes |
| Starting capital | No | No | No | No | No | Yes |
| R ² | 0.0003 | 0.0259 | 0.0311 | 0.0313 | 0.0331 | 0.0378 |
| N | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 |
| Mean dep. var. | 0.0030 | 0.0030 | 0.0030 | 0.0030 | 0.0030 | 0.0030 |

Panel B: Oster’s tests for omitted variables

| Panel B-1: Robustness of the baseline model | | | | | | | | |
|--|--|---------|----------------------|---------|-----------------------------|---------|--------|---------------------------|
| Parameters: | $R_{max}^2 = \min(2 * R_c^2, 1) = 0.0518$ and $\delta = 1$ | | | | | | | |
| Model: | Uncontrolled effect | | Controlled effect | | Identified set | | Reject | δ s.t. $\beta = 0$ |
| Controls: | None | | Baseline | | [bound1 ; bound2] | | Null? | and R_{max}^2 |
| Treatment variable: | β_u | R_u^2 | β_c | R_c^2 | [$\beta_c ; \beta_{adj}$] | | | |
| Female | -0.0120 | 0.0003 | -0.0012 | 0.0311 | -0.0012 | -0.0003 | Yes | 1.357 |
| Panel B-2: Robustness of the augmented model | | | | | | | | |
| Choice of Parameters: | $R_{max}^2 = \min(2 * R_c^2, 1) = 0.0756$ and $\delta = 1$ | | | | | | | |
| Model: | Uncontrolled effect | | Controlled effect | | Identified set | | Reject | δ s.t. $\beta = 0$ |
| Controls: | None | | Baseline + Augmented | | [bound1 ; bound2] | | Null? | and R_{max}^2 |
| Treatment variable: | β_u | R_u^2 | β_c | R_c^2 | [$\beta_c ; \beta_{adj}$] | | | |
| Female | -0.0120 | 0.003 | -0.0011 | 0.0378 | -0.00712 | -0.0001 | Yes | 1.049 |

Figure 4. Oaxaca-Blinder decomposition of the entrepreneurs use of VC

Source: SINE survey. Sample: New firms founded in 2010, 2014, and 2018. This figure plots the results of the Blinder-Oaxaca decomposition of the difference in the use of VC between male and female entrepreneurs. The Oaxaca-Blinder decomposition decomposes the mean difference in the use of VC financing between male and female-founded startups into two components: the "explained effect" and the "unexplained effect". I start by estimating separate OLS regressions for male (m) and female (f) entrepreneurs: $VC_m = \beta_m X_m + \varepsilon_m$ and $VC_f = \beta_f X_f + \varepsilon_f$, where VC is the use of VC financing, X is a vector of explanatory variables such as education, experience, incorporation status, and growth preferences. β is a vector of coefficients, and ε is an error term. I denote the mean values with a bar over the variables in the vector X. Then, since OLS with a constant term produces residuals with a zero mean, I obtain: $VC_m - VC_f = \underbrace{\beta_m(\bar{X}_m - \bar{X}_f)}_{\text{Explained effect}} + \underbrace{\bar{\varepsilon}_f}_{\text{Unexplained effect}}$. The explained effects correspond to the impact of gender differences in the explanatory variables evaluated using the male coefficients. The unexplained effects correspond to the average female residual from the male wage equation.

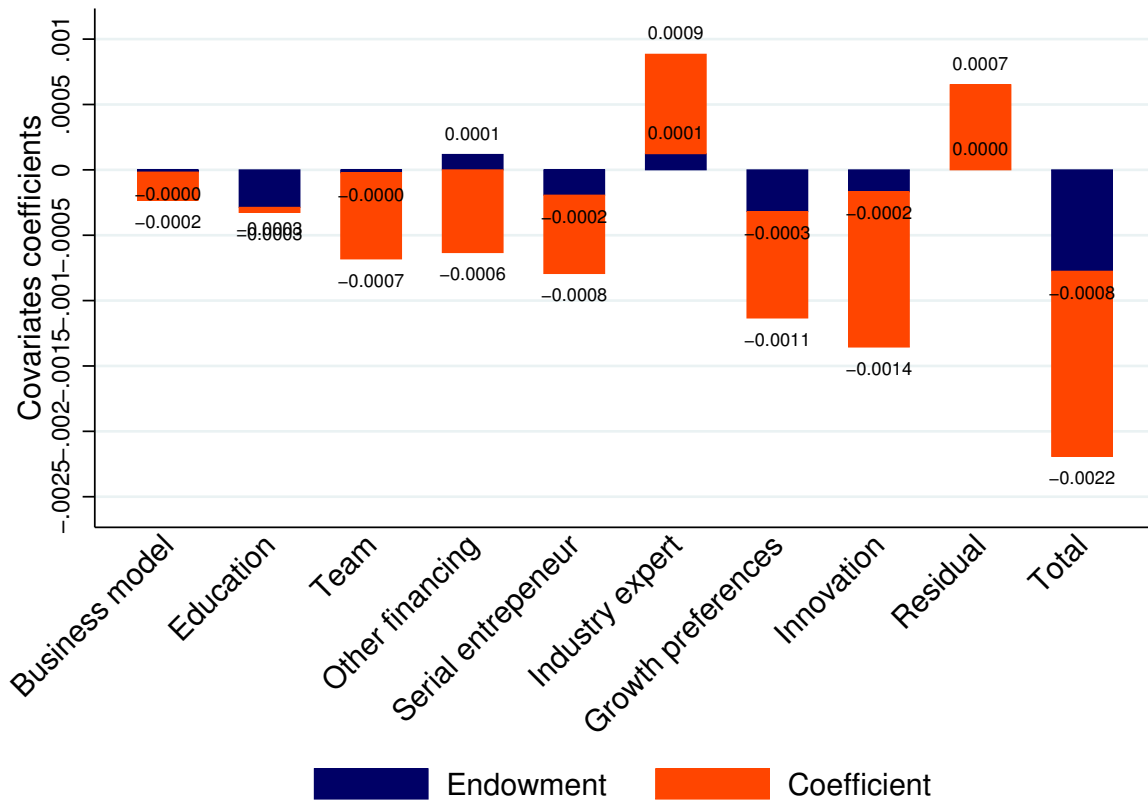


Table 8. Selection into High-Growth Entrepreneurial Strategies - Decision to Incorporate

Source: SINE survey and Firm registry. *Sample:* New firms founded in 2010, 2014, and 2018. This table uses OLS to test whether entrepreneurs self-select into high-growth entrepreneurial strategies. This table focuses on the decision to incorporate. The dependent variable is a dummy variable that takes the value one if the startup is incorporated and zero if it is a sole-proprietorship. The main independent variables are the entrepreneur's gender, *Female*, interacted with entrepreneurs' individual characteristics including Serial entrepreneur, Elite school, Co-founders, High growth oriented, Innovative business. All models include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. They also include county and 5-digit French SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

| Panel A: Choice to start in a male-dominated sector | | | | | | |
|---|-------------------------|------------|------------|------------|------------|------------|
| Dependent variable | 1(Incorporated startup) | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Female \times Serial entrepreneur | -0.0204* | | | | | |
| | (0.012) | | | | | |
| Female \times Elite engineering school | | 0.0629*** | | | | |
| | | (0.018) | | | | |
| Female \times Co-founder(s) | | | 0.0449** | | | |
| | | | (0.019) | | | |
| Female \times High-growth | | | | 0.0356*** | | |
| | | | | (0.013) | | |
| Female \times Difficulty financing | | | | | 0.0309** | |
| | | | | | (0.013) | |
| Female \times Innovative business | | | | | | 0.0001 |
| | | | | | | (0.007) |
| Difficulties - Getting fundings | | | | | 0.0005 | |
| | | | | | (0.005) | |
| Female | -0.0331*** | -0.0413*** | -0.0504*** | -0.0497*** | -0.0447*** | -0.0384*** |
| | (0.010) | (0.008) | (0.011) | (0.011) | (0.010) | (0.009) |
| Serial entrepreneur | 0.0295*** | 0.0245*** | 0.0249*** | 0.0247*** | 0.0244*** | 0.0245*** |
| | (0.008) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) |
| Grande ecole | 0.0313*** | 0.0194*** | 0.0316*** | 0.0320*** | 0.0314*** | 0.0313*** |
| | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) |
| Co-founder(s) | 0.1562*** | 0.1565*** | 0.1435*** | 0.1563*** | 0.1560*** | 0.1564*** |
| | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) |
| High-growth oriented | 0.1197*** | 0.1199*** | 0.1198*** | 0.1105*** | 0.1190*** | 0.1197*** |
| | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) |
| Innovative business | 0.0132*** | 0.0131*** | 0.0134*** | 0.0131*** | 0.0125*** | 0.0131*** |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Other controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Sector \times Cohort FE | Yes | Yes | Yes | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes | Yes | Yes | Yes |
| R ² | 0.329 | 0.329 | 0.329 | 0.329 | 0.329 | 0.329 |
| N | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 |
| Mean Dep. Var. | 0.6164 | 0.6164 | 0.6164 | 0.6164 | 0.6164 | 0.6164 |

Table 9. VC Financing and Entrepreneurs' Performance

Source: SINE survey and tax files. *Sample:* New firms founded in 2010, 2014, and 2018. This table uses OLS to analyze the performance of female-founded versus male-founded startups depending on their VC funding status. The dependent variables are the likelihood to survive after 3 years, after 5 years, the sales growth between year 0 to year 3, and between year 0 to year 5, and the employment growth between year 0 to year 3, and between year 0 to year 5. The main independent variables are the entrepreneur's gender, *Female*, interacted with the use of *VC*. All models include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. They also include county and 5-digit French SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

| Dependent variable | 1(Survival) | | Δ sales | | Δ employment | |
|--------------------------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| | ≥ 3 (1) | ≥ 5 (2) | (0,3) (3) | (0,5) (4) | (0,3) (5) | (0,5) (6) |
| Female | -0.0115** (0.01) | -0.0041 (0.00) | -0.0191* (0.01) | -0.0509*** (0.02) | -0.0458*** (0.02) | -0.0486 (0.03) |
| VC | -0.0030 (0.03) | 0.0130 (0.02) | 0.0372 (0.11) | 0.1219 (0.16) | 0.0470 (0.09) | 0.3011** (0.14) |
| Female \times VC | 0.2486*** (0.05) | 0.1323 (0.10) | 0.5433** (0.24) | 0.7874* (0.46) | 0.1690 (0.21) | -0.8887*** (0.24) |
| Age ≥ 40 | 0.0049 (0.00) | 0.0008 (0.00) | -0.0388*** (0.01) | -0.0843*** (0.02) | -0.0401*** (0.01) | -0.0865*** (0.02) |
| French national | 0.0193*** (0.01) | 0.0080 (0.01) | -0.0020 (0.02) | 0.0286 (0.03) | 0.0110 (0.02) | 0.0498 (0.03) |
| Undergraduate | -0.0029 (0.01) | -0.0063 (0.00) | 0.0371*** (0.01) | 0.0306 (0.02) | 0.0461** (0.02) | 0.0502 (0.04) |
| Graduate | 0.0125** (0.01) | 0.0068 (0.01) | 0.0364*** (0.01) | 0.0528** (0.02) | -0.0063 (0.02) | -0.0139 (0.03) |
| Elite engineering school | -0.0145* (0.01) | -0.0110 (0.01) | -0.0042 (0.02) | -0.0529 (0.04) | 0.0694** (0.03) | 0.0340 (0.06) |
| Expert | 0.0350*** (0.00) | 0.0238*** (0.00) | 0.0217* (0.01) | 0.0137 (0.02) | 0.0035 (0.02) | -0.0131 (0.03) |
| Serial | 0.0103** (0.00) | -0.0057* (0.00) | -0.0472*** (0.01) | -0.0967*** (0.02) | -0.0249** (0.01) | -0.0361* (0.02) |
| Co-founder(s) | 0.0087** (0.00) | 0.0037 (0.00) | 0.0268*** (0.01) | 0.0246 (0.02) | -0.0028 (0.01) | -0.0370 (0.03) |
| Incorporated | 0.1721*** (0.01) | 0.1121*** (0.01) | 0.1070*** (0.02) | 0.4532*** (0.03) | 0.0341 (0.02) | 0.0601 (0.04) |
| High-growth oriented | -0.0010 (0.00) | 0.0036 (0.00) | 0.0725*** (0.01) | 0.0844*** (0.02) | 0.0364*** (0.01) | 0.0276 (0.02) |
| Innovative business | -0.0012 (0.00) | -0.0022 (0.00) | 0.0097 (0.01) | 0.0134 (0.02) | 0.0162 (0.01) | 0.0302 (0.02) |
| SIC-5 Sector \times Cohort-year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes | Yes | Yes | Yes |
| R ² | 0.073 | 0.433 | 0.060 | 0.115 | 0.109 | 0.136 |
| N | 64,137 | 64,137 | 42,003 | 18,027 | 9,735 | 3,553 |
| Mean dep. var. | 0.7341 | 0.3009 | 0.4999 | 0.3647 | 0.2297 | 0.3114 |

Variable Descriptions

| Variable | Description |
|---|---|
| <u>Biographical characteristics and Experience (Source: SINE)</u> | |
| Female | Dummy variable that equals one if the start-up is founded by a female entrepreneur and zero if it is founded by a male entrepreneur. |
| Age \geq 40 | Dummy variable that equals one if the entrepreneur is 40 years old or older at creation. |
| French | Dummy variable that equals one if the entrepreneur is a French citizen and zero otherwise. |
| <u>Education:</u> | |
| High school | Dummy variable which equals to one if the entrepreneur's highest degree is a high school diploma and zero otherwise. |
| Undergraduate | Dummy variable that equals one if the entrepreneur's highest diploma is a bachelor's degree (License) and zero otherwise. |
| Graduate | Dummy variable that equals one if the entrepreneur has at least a five-year master's degree, including JD, MD, and PhD degrees (Master, Grande école, Doctorat), and zero otherwise. |
| Elite school | Dummy variable that equals one if the entrepreneur graduated from a Grande école, a top engineering or business school (e.g., Ecole Polytechnique, Centrale, Mines, HEC, ESSEC among others), and zero otherwise. |
| <u>Experience:</u> | |
| Industry expert | Dummy variable that equals one if the entrepreneur has at least three years of prior work experience in the sector in which the start-up is incorporated and zero otherwise. |
| Serial | Dummy variable that equals one if the entrepreneur has already founded a start-up and zero otherwise. |
| Previously CEO | Dummy variable that equals one if the entrepreneur was previously the CEO of another firm and zero otherwise. |
| Previously self-employed | Dummy variable that equals one if the entrepreneur was previously self-employed and zero otherwise. |
| Previously employee | Dummy variable that equals one if the entrepreneur was previously employed by another firm and zero otherwise. |
| Previously unemployed | Dummy variable that equals one if the entrepreneur was unemployed or inactive and zero otherwise. |
| Previously student | Dummy variable that equals one if the entrepreneur was previously a student and zero otherwise. |
| <u>Family:</u> | |
| Married | Dummy variable that equals one if the entrepreneur is married or in a spousal relationship and zero otherwise. |
| Children | Dummy variable that equals one if the entrepreneur has at least one child at the start-up creation date and zero otherwise. |
| Entrepreneurial family | Dummy variable that equals one if there are entrepreneurs in the entrepreneur's relatives and zero otherwise. |
| <u>Team:</u> | |
| Co-founder(s) | Dummy variable that equals one if the entrepreneur has at least one co-founder and zero if she starts on her own. |
| Founded with spouse | Dummy variable that equals one if the entrepreneur starts with her spouse and zero otherwise. |
| Founded with family | Dummy variable that equals one if the entrepreneur starts with a sibling, a relative or a friend and zero otherwise. |
| Founded with business partners | Dummy variable that equals one if the entrepreneur starts with a business partner and zero otherwise. |
| Help from family | Dummy variable that equals one if the entrepreneur sought help from family members to create the firm and zero otherwise. |
| Help from business partners | Dummy variable that equals one if the entrepreneur sought help from business partners to create the firm and zero otherwise. |
| Help from specialists | Dummy variable that equals one if the entrepreneur sought advise from specialists and professionals' including lawyers, accountants, incubators to create the firm and zero otherwise. |

Continued on next page

| Variable | Description |
|--|---|
| No external help | Dummy variable that equals one if the entrepreneur did not seek for external help to create the firm. |
| <u>Growth preferences:</u> | |
| Incorporation status | Dummy variable that equals one if the start-up is incorporated and zero if it is a sole proprietorship. |
| High-growth oriented | Dummy variable that stems from the question “What is your main objective?” and equals one if the entrepreneur answers “to develop the company” but zero if she answers “mainly to create my own job”. |
| Motivation items stem from the question “What are your three main motivations?”: | |
| Independence | Dummy variable that equals one if the entrepreneur ticks the box “desire to be independent” and zero otherwise. |
| New idea | Dummy variable that equals one if the entrepreneur ticks the box “a new idea for a product, service, or market” and zero otherwise. |
| Taste | Dummy variable that equals one if the entrepreneur ticks the box “taste for entrepreneurship or new challenges” and zero otherwise. |
| Opportunity | Dummy variable that equals one if the entrepreneur ticks the box “an opportunity to create a start-up” and zero otherwise. |
| Successful peers | Dummy variable that equals one if the entrepreneur ticks the box “inspired by a successful entrepreneur” and zero otherwise. |
| Unemployed, choice | Dummy variable that equals one if the entrepreneur ticks the box “because unemployed” and zero otherwise. |
| Other reasons | Dummy variable that equals one if the entrepreneur ticks the box “other reasons” and zero otherwise. |
| <u>Innovation:</u> | |
| Innovative business | Dummy variable that equals one if the entrepreneur is bringing a new innovation in terms of product, services, marketing, or organization and zero otherwise. |
| Product innovation | Dummy variable that equals one if the entrepreneur is bringing a new innovation in terms of product or services and zero otherwise. |
| Marketing innovation | Dummy variable that equals one if the entrepreneur is bringing a new innovation in terms of marketing and zero otherwise. |
| Organization innovation | Dummy variable that equals one if the entrepreneur is bringing a new innovation in terms of organization and zero otherwise. |
| <u>Difficulties at creation:</u> | |
| Difficulty items stem from the question “What are the main difficulties you faced during the startup creation process?”: | |
| None | Dummy variable that equals one if the entrepreneur ticks the box “no specific difficulty” and zero otherwise. |
| Getting funding | Dummy variable that equals one if the entrepreneur ticks the box “getting funding” and zero otherwise. |
| Opening a bank account | Dummy variable that equals one if the entrepreneur ticks the box “opening a corporate bank account” and zero otherwise. |
| Getting a bank overdraft | Dummy variable that equals one if the entrepreneur ticks the box “getting a bank overdraft” and zero otherwise. |
| Hiring skilled workers | Dummy variable that equals one if the entrepreneur ticks the box “hiring skilled workers” and zero otherwise. |
| Finding clients | Dummy variable that equals one if the entrepreneur ticks the box “Finding new clients” and zero otherwise. |
| Administrative tasks | Dummy variable that equals one if the entrepreneur ticks the box “handing the administrative tasks” and zero otherwise. |
| Being alone | Dummy variable that equals one if the entrepreneur ticks the box “being alone” and zero otherwise. |
| <u>Business model:</u> | |
| B2B business | Dummy variable that equals one if the new firm is (B2B) business-to-business oriented and zero if it is business-to-customer (B2C) oriented. |
| Local customers | Dummy variable that equals one if the new firm has mainly local customers and zero otherwise. |
| Domestic customers | Dummy variable that equals one if the new firm has mainly domestic customers (in France) and zero otherwise. |
| International customers | Dummy variable that equals one if the new firm has mainly international customers (outside of France) and zero otherwise. |

Continued on next page

| Variable | Description |
|--|--|
| 1 or 2 customers | Dummy variable that equals one if the new firm has one or two main clients and zero otherwise. |
| 3 or 10 customers | Dummy variable that equals one if the new firm has three to ten clients and zero otherwise. |
| Many customers | Dummy variable that equals one if the new firm has more than ten clients and zero otherwise. |
| Many customers, a few big ones | Dummy variable that equals one if the new firm has more than ten clients with a few big ones, and zero otherwise. |
| <u>Capital and sources of income:</u> | |
| Starting capital | Categorical variables that equal one if the amount invested at creation falls into one of these categories: <2k, [\$2k-4k[, [\$4k-8k[, [\$8k-16k[, [\$16k-40k[, [\$40k-80k[, [\$80k-160k[or ≥\$160k and zero otherwise |
| Other employment income | Dummy variable that equals one if the entrepreneur has access to other employment income and zero otherwise. |
| Spouse income | Dummy variable that equals one if the entrepreneur has access to spouse income and zero otherwise. |
| No other income | Dummy variable that equals one if the entrepreneur does not have any other sources of income and zero if she has. |
| % inside equity | share of personal resources in the firm's total assets. This information is available only for the 2010 cohort. |
| % bank loans | share of bank loans in the firm's total assets. This information is available only for the 2010 cohort. |
| % other financing | share of other financing in the firm's total assets. This information is available only for the 2010 cohort. |
| <u>External financing sources</u> | |
| External financing | Dummy variable that equals one if the start-up uses any source of external financing and zero otherwise. |
| Venture capital | Dummy variable that equals one if the start-up uses VC financing and zero otherwise. |
| External equity | Dummy variable that equals one if the start-up uses venture capital or other equity financing and zero otherwise. |
| Bank corporate debt | Dummy variable that equals one if the start-up uses bank debt granted to the startup and zero otherwise. |
| Bank personal debt | Dummy variable that equals one if the start-up uses personal debt for the startup and zero otherwise. |
| Other loans | Dummy variable that equals one if the start-up uses other types of loans for the startup and zero otherwise. Examples of other loans include zero-percent loans and |
| Microcredit & crowd-funding | Dummy variable that equals one if the start-up uses microcredit and/or crowd-funding for the startup and zero otherwise. The crowdfunding information is only available for the 2014 and 2018 cohorts. Microcredits includes informal loans from family and friends. |
| Public grant | Dummy variable that equals one if the start-up uses a cash grant coming from various public programs and zero otherwise. Examples of public programs are ACCRE, NACRE, PCE, CIR programs, OSEO innovation grants, and AGEFIPH aid. |
| <u>Sector-level measures (at the 5-digit SIC level):</u> | |
| Male-dominated sector | Dummy variable that equals one if more than 50% of new firms within a SIC-5 digit sector are founded by women and zero otherwise. <i>Source:</i> Firm registry |
| Innovative sector | Dummy variable that equals one if the startup operates in a SIC-5 digit innovative sector defined by the French statistical institute and zero otherwise. |
| N. VC deals within sector | Number of VC deals within the SIC-5 digit sector within a year. |
| Concentrated sector | Top quintile of the distribution of SIC-5 digit sectors in terms of Herfindhal index. The Herfindhal index is calculated using sales of firms in ther sector. <i>Source:</i> Tax files |
| Competitive sector | Bottom quintile of the distribution of SIC-5 digit sectors in terms of Herfindhal index. <i>Source:</i> Tax files |
| High profit margin sector | Top quintile of the distribution of SIC-5 digit sectors in profit margin calculated as the sector total net income divided by the total sales. <i>Source:</i> Tax files |

Continued on next page

| Variable | Description |
|--|--|
| Balance sheet and performance variables (Sources: Tax files & Employer payrolls) | |
| Survival 3 years | Dummy variable that equals one if the start-up survives three years after creation and zero otherwise. |
| Survival 5 years | Dummy variable that equals one if the start-up survives five years after creation and zero otherwise. |
| Employment size at start | Number of employees at the end of the first year. Employment size is also created at periods three years after creation (t+3) and five years after creation (t+5). |
| N. employees | Number of employees. |
| Δ sales (0,3) | Variation of firm sales between the first year of operation and year t+3 |
| Δ sales (0,5) | Variation of firm sales between the first year of operation and year t+5 |
| Δ employment (0,3) | Variation of firm's number of employees between the first year of operation and year t+3 |
| Δ employment (0,5) | Variation of firm's number of employees between the first year of operation and year t+5 |
| Log(total assets) | Logarithm of the total assets on the balance sheet. |
| Tangible/ total assets | Tangible ratio is the sum of tangible assets divided by the balance sheet total assets. |

A. Additional Figures and Tables

Table A1. Profile of Entrepreneurs and the Entrepreneurial Pipeline

Source: SINE survey. *Sample:* New firms founded in 2010, 2014, and 2018. This table analyzes the correlation between the entrepreneurs' profiles and choices made at different stages of the entrepreneurial pipeline. The dependent variables are entrepreneur's gender *Female* (column 1), whether the entrepreneur is *High-growth oriented* (column 2), whether the startup is *Incorporated* (column 3), and whether the entrepreneur uses *VC* for the startup (column 4). All models include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. They also include county and 5-digit French SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

| Dependent variable: | Female entrepreneur | High-growth preference | Incorporated startup | VC |
|---------------------------|----------------------|------------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) |
| Female | | -0.0506*** (0.00) | -0.0384*** (0.01) | -0.0012*** (0.00) |
| Age \geq 40 | -0.0132** (0.01) | -0.0371*** (0.00) | 0.0249*** (0.01) | 0.0006 (0.00) |
| French national | 0.0252*** (0.01) | -0.0331*** (0.01) | -0.0042 (0.01) | 0.0007 (0.00) |
| Undergraduate | 0.0660*** (0.01) | 0.0003 (0.01) | 0.0549*** (0.01) | -0.0019*** (0.00) |
| Graduate | 0.0745*** (0.01) | 0.0084 (0.01) | 0.0590*** (0.01) | 0.0013** (0.00) |
| Grande ecole | -0.1339*** (0.01) | 0.0357*** (0.01) | 0.0281*** (0.01) | 0.0083*** (0.00) |
| Industry expert | -0.0691*** (0.01) | -0.0076 (0.00) | 0.0189** (0.01) | -0.0011** (0.00) |
| Serial entrepreneur | -0.0757*** (0.01) | 0.0385*** (0.00) | 0.0212*** (0.01) | 0.0014*** (0.00) |
| Co-founder(s) | 0.0204*** (0.01) | 0.1181*** (0.01) | 0.1520*** (0.01) | 0.0031*** (0.00) |
| Innovative business | 0.0077** (0.00) | 0.0998*** (0.00) | 0.0062* (0.00) | 0.0017*** (0.00) |
| High-growth oriented | -0.0449*** (0.01) | | 0.1074*** (0.01) | 0.0024*** (0.00) |
| Incorporated | -0.0399*** (0.01) | 0.1256*** (0.01) | | 0.0006 (0.00) |
| Independent | -0.0141*** (0.00) | -0.1037*** (0.00) | -0.0242*** (0.00) | -0.0003 (0.00) |
| Taste | -0.0177*** (0.00) | 0.1506*** (0.00) | 0.0371*** (0.00) | -0.0001 (0.00) |
| New Idea | 0.0068 (0.00) | 0.1043*** (0.01) | 0.0263*** (0.00) | 0.0037*** (0.00) |
| Opportunity | 0.0230*** (0.00) | 0.0460*** (0.01) | 0.0231*** (0.00) | -0.0004 (0.00) |
| Successful peer | 0.0135** (0.01) | 0.0142*** (0.01) | -0.0058 (0.01) | 0.0018* (0.00) |
| Other controls | Yes | Yes | Yes | Yes |
| Sector \times Cohort FE | Yes | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes | Yes |
| R ² | 0.208 | 0.176 | 0.331 | 0.031 |
| N | 79,276 | 79,276 | 79,276 | 79,276 |
| Mean Dep. Var. | 0.293 | 0.340 | 0.616 | 0.003 |

Do Entrepreneurs Substitute External Equity with Other Financing Sources?

Source: SINE survey and tax files. *Sample:* New firms founded in 2002, 2006, 2010 and 2014. This table uses OLS to study whether entrepreneurs substitute the VC financing by other financing sources. The dependent variable is a dummy variable that is equal to one if the startup uses VC. The entrepreneur's gender, *Female*, is interacted with other external financing sources: bank debt in column (1), personal debt in column (2), non-bank debt in column (3), microcredit in column (4), public grants in column (5), and other sources of external equity in column (6). All models include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. In addition, this table include the size of the firm (Log(total assets)) and asset tangibility (Tangible assets/total assets) at the end of the first year of operation. They also include county and 5-digit French SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

Source: SINE survey and tax files. *Sample:*

| Dependent variable: | External equity | | All external | Public | Bank loans | | Other loans | |
|--------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | VC (1) | All types (2) | Financing (3) | Grants (4) | Corporate debt (5) | Personal debt (6) | Microcredit (7) | Other (8) |
| Female | -0.0023*** (0.001) | -0.0073*** (0.001) | 0.0097 (0.007) | 0.0070* (0.004) | 0.0016 (0.006) | 0.0035 (0.003) | 0.0020 (0.001) | 0.0145*** (0.003) |
| Age \geq 40 | 0.0007 (0.000) | 0.0036*** (0.001) | -0.0286*** (0.004) | -0.0067** (0.003) | -0.0361*** (0.003) | 0.0018 (0.002) | 0.0001 (0.001) | -0.0124*** (0.002) |
| French national | 0.0005 (0.001) | 0.0006 (0.002) | 0.1342*** (0.009) | 0.0599*** (0.004) | 0.1205*** (0.006) | 0.0305*** (0.004) | -0.0074*** (0.002) | 0.0147*** (0.003) |
| Undergraduate | -0.0017*** (0.000) | 0.0038** (0.002) | 0.0184*** (0.005) | 0.0209*** (0.004) | 0.0239*** (0.006) | 0.0021 (0.003) | -0.0029* (0.002) | 0.0108*** (0.003) |
| Graduate | 0.0018** (0.001) | 0.0108*** (0.002) | -0.0216*** (0.005) | 0.0083** (0.004) | -0.0212*** (0.005) | -0.0123*** (0.003) | -0.0057*** (0.002) | 0.0006 (0.003) |
| Grande ecole | 0.0100*** (0.003) | 0.0168*** (0.005) | -0.0178** (0.009) | 0.0103** (0.005) | -0.0305*** (0.007) | -0.0102** (0.005) | -0.0011 (0.002) | 0.0006 (0.005) |
| Industry expert | -0.0013** (0.001) | 0.0026** (0.001) | 0.0264*** (0.005) | -0.0096*** (0.003) | 0.0346*** (0.005) | 0.0031 (0.002) | -0.0043*** (0.001) | 0.0084*** (0.002) |
| Serial entrepreneur | 0.0016*** (0.001) | 0.0130*** (0.001) | -0.0620*** (0.006) | -0.0835*** (0.004) | -0.0366*** (0.006) | -0.0061** (0.002) | -0.0021* (0.001) | -0.0281*** (0.002) |
| Co-founder(s) | 0.0023*** (0.001) | 0.0150*** (0.002) | 0.0041 (0.004) | -0.0289*** (0.003) | 0.0324*** (0.005) | -0.0087*** (0.003) | -0.0058*** (0.001) | 0.0003 (0.002) |
| Incorporated | 0.0007 (0.001) | 0.0153*** (0.001) | 0.0100 (0.006) | -0.0501*** (0.004) | 0.0992*** (0.007) | -0.0490*** (0.005) | -0.0117*** (0.002) | 0.0086*** (0.002) |
| High-growth oriented | 0.0027*** (0.001) | 0.0185*** (0.002) | 0.0352*** (0.004) | -0.0079*** (0.003) | 0.0300*** (0.004) | 0.0117*** (0.002) | 0.0013 (0.001) | 0.0129*** (0.002) |
| Innovative business | 0.0026*** (0.001) | 0.0058*** (0.001) | 0.0734*** (0.004) | 0.0580*** (0.003) | 0.0380*** (0.004) | 0.0259*** (0.002) | 0.0067*** (0.001) | 0.0259*** (0.003) |
| Tangible/total assets t=0 | -0.0012 (0.002) | 0.0019 (0.003) | 0.1744*** (0.012) | 0.0701*** (0.008) | 0.1854*** (0.011) | 0.0450*** (0.008) | -0.0002 (0.003) | 0.0450*** (0.006) |
| Log(total assets) t=0 | 0.0002 (0.000) | 0.0035*** (0.000) | 0.0188*** (0.002) | -0.0035*** (0.001) | 0.0254*** (0.002) | 0.0046*** (0.001) | -0.0002 (0.000) | 0.0032*** (0.001) |
| SIC-5 Sector \times Cohort-year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| R ² | 0.029 | 0.045 | 0.160 | 0.250 | 0.121 | 0.057 | 0.024 | 0.043 |
| N | 58,552 | 93,331 | 93,331 | 93,331 | 93,331 | 93,331 | 58,552 | 93,331 |
| Mean dep. var. | 0.0031 | 0.0284 | 0.5149 | 0.2008 | 0.3023 | 0.1261 | 0.0158 | 0.0877 |

Table A2. Gender Gap among Entrepreneurs who are More Likely to Seek VC Financing

Source: SINE survey and tax files. *Sample:* New firms founded in 2010, 2014, and 2018. This table uses OLS to analyze the effect of gender on the use of VC financing among entrepreneurs who are more likely to seek VC financing. The dependent variable is VC financing which takes the value one if the entrepreneur uses VC financing. The main independent variable is the entrepreneur's gender, *Female*. The sample is restricted to Serial entrepreneurs (column 1), incorporated startups (column 2), entrepreneurs who have the growth of the startup as their main motivation (column 3), entrepreneurs who declare that getting financing is one of their main difficulties (column 4), incorporated startups that do not use any external financing sources (column 5), entrepreneurs who do not have children (column 6). All models include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. They also include county and 5-digit French SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

| Dependent variable: X: | 1(VC X) | | | | | |
|---------------------------|----------------------------|------------------------------|-----------------------------|-------------------------------------|---|----------------------|
| | Serial entrepreneur (1) | Incorporated start-up (2) | High-growth oriented (3) | Difficulty raising financing (4) | Incorporated & No external financing (5) | No children (6) |
| Female | -0.0021** (0.001) | -0.0018*** (0.001) | -0.0019* (0.001) | -0.0023** (0.001) | -0.0016** (0.001) | -0.0012** (0.001) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Sector \times Cohort FE | Yes | Yes | Yes | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes | Yes | Yes | Yes |
| R ² | 0.077 | 0.038 | 0.072 | 0.092 | 0.057 | 0.046 |
| N | 23,675 | 48,817 | 26,788 | 16,743 | 28,182 | 20,379 |
| Mean Dep. Var. | 0.0046 | 0.0041 | 0.0060 | 0.0062 | 0.0028 | 0.0029 |

Do Entrepreneurs Substitute VC with Other Financing Sources?

Source: SINE survey. *Sample:* New firms founded in 2010, 2014, and 2018. This table uses OLS to study whether entrepreneurs substitute the VC financing by other financing sources. The dependent variable is a dummy variable that is equal to one if the startup uses VC. The entrepreneur's gender, *Female*, is interacted with other external financing sources: bank debt in column (1), personal debt in column (2), non-bank debt in column (3), microcredit in column (4), public grants in column (5), and other sources of external equity in column (6). All models include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. They also include county and 5-digit French SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

| Dependent variable: | 1(VC) | | | | | |
|---------------------------------------|-------------------------------|-------------------------|---------------------|----------------------|-------------------------|------------------------|
| Item: | Bank debt corporate (1) | Personal debt (2) | Other debt (3) | Microcredit (4) | Public grants (5) | Other equity (6) |
| Female | -0.0009** (0.00) | -0.0012*** (0.00) | -0.0009** (0.00) | -0.0010*** (0.00) | -0.0011*** (0.00) | -0.0011*** (0.00) |
| Bank loan | 0.0010 (0.00) | | | | | |
| Female \times Bank loans | -0.0009 (0.00) | | | | | |
| Personal loan | | 0.0007 (0.00) | | | | |
| Female \times Personal loans | | 0.0001 (0.00) | | | | |
| Other loans | | | | 0.0053*** (0.00) | | |
| Female \times Other loans | | | | -0.0030 (0.00) | | |
| Microcredit | | | | | 0.0052* (0.00) | |
| Female \times Microcredit | | | | | -0.0068** (0.00) | |
| Public grant | | | 0.0102*** (0.00) | | | |
| Female \times Public grants | | | -0.0047* (0.00) | | | |
| Other external equity | | | | | | 0.0117*** (0.00) |
| Female \times Other external equity | | | | | | -0.0013 (0.01) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Sector \times Cohort FE | Yes | Yes | Yes | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes | Yes | Yes | Yes |
| R ² | 0.030 | 0.030 | 0.032 | 0.031 | 0.031 | 0.031 |
| N | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 |
| Mean Dep. Var. | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |

Table A3. Selection into High-Growth Entrepreneurial Strategies - Choice of the Sector

Source: SINE survey and Firm registry. *Sample:* New firms founded in 2010, 2014, and 2018. This table uses OLS to test whether entrepreneurs self-select into high-growth entrepreneurial strategies. This table focuses on the choice of the sector. The dependent variable is a dummy variable that takes the value one if the 5-digit SIC sector is male-dominated according to the percentage of new firms created in the sector. The main independent variables are the entrepreneur's gender, *Female*, interacted with entrepreneurs' individual characteristics including Serial entrepreneur, Elite school, Co-founders, High growth oriented, Innovative business. All models include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. They also include county and 5-digit French SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

| Panel A: Choice to start in a male-dominated sector | | | | | | |
|---|--------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Dependent variable | 1(Male-dominated sector) | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Female \times Serial entrepreneur | 0.0502*** (0.015) | | | | | |
| Female \times Elite engineering school | | 0.0928* (0.051) | | | | |
| Female \times Co-founder(s) | | | 0.1314*** (0.035) | | | |
| Female \times Incorporated | | | | 0.2461*** (0.037) | | |
| Female \times High-growth | | | | | 0.1333*** (0.020) | |
| Female \times Innovative business | | | | | | 0.0403** (0.017) |
| Female | -0.2586*** (0.045) | -0.2499*** (0.044) | -0.2792*** (0.047) | -0.3841*** (0.054) | -0.2864*** (0.045) | -0.2651*** (0.043) |
| Serial entrepreneur | -0.0180*** (0.006) | -0.0057 (0.006) | -0.0044 (0.006) | -0.0017 (0.006) | -0.0047 (0.006) | -0.0057 (0.006) |
| Grande ecole | 0.0589** (0.027) | 0.0415 (0.031) | 0.0596** (0.027) | 0.0610** (0.026) | 0.0610** (0.027) | 0.0588** (0.027) |
| Co-founder(s) | -0.0016 (0.016) | -0.0017 (0.016) | -0.0398*** (0.011) | -0.0034 (0.015) | -0.0017 (0.016) | -0.0015 (0.016) |
| Incorporated | 0.1358*** (0.043) | 0.1353*** (0.043) | 0.1339*** (0.043) | 0.0580* (0.032) | 0.1330*** (0.042) | 0.1353*** (0.042) |
| High-growth oriented | 0.0206** (0.009) | 0.0208** (0.009) | 0.0209** (0.009) | 0.0194** (0.009) | -0.0140** (0.007) | 0.0207** (0.009) |
| Innovative business | -0.0138 (0.012) | -0.0137 (0.012) | -0.0127 (0.012) | -0.0145 (0.011) | -0.0138 (0.012) | -0.0256*** (0.008) |
| Other controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Cohort FE | Yes | Yes | Yes | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes | Yes | Yes | Yes |
| R ² | 0.148 | 0.148 | 0.152 | 0.166 | 0.152 | 0.148 |
| N | 79,496 | 79,496 | 79,496 | 79,496 | 79,496 | 79,496 |
| Mean Dep. Var. | 0.7884 | 0.7884 | 0.7884 | 0.7884 | 0.7884 | 0.7884 |

Table A4. Oaxaca-Blinder Decomposition of the Entrepreneur's Use of VC

Source: SINE survey 2006-2014 and tax files. Sample:

| | Baseline model | | Baseline + Family | |
|-------------|----------------|-----|-------------------|-----|
| Mean Female | 0.0015*** | | 0.0017*** | |
| Mean Male | 0.0036*** | | 0.0033*** | |
| Difference | -0.0021*** | | -0.0016*** | |
| Endowment | -0.0008*** | | -0.0006*** | |
| Coefficient | -0.0014*** | 67% | -0.0010** | 63% |

| | Endowment (1) | Coefficient (2) | Endowment (3) | Coefficient (4) |
|-----------------------------|------------------|--------------------|------------------|--------------------|
| Age and citizenship | -0.0000 | 0.0014* | -0.0001 | 0.0024** |
| Education | -0.0003*** | -0.0001 | -0.0003** | -0.0003 |
| Industry expert | 0.0001*** | 0.0009* | 0.0001 | 0.0001 |
| Serial entrepreneur | -0.0002*** | -0.0005** | -0.0003*** | -0.0004 |
| Team composition | -0.0001*** | -0.0006** | -0.0001** | -0.0006 |
| Incorporated | -0.0001 | -0.0002 | 0.0000 | -0.0005 |
| Innovative | 0.0000*** | -0.0010*** | 0.0000** | -0.0016*** |
| Growth preferences | -0.0003*** | -0.0008 | -0.0001 | -0.0006 |
| Preference for independence | -0.0000 | 0.0002 | -0.0000 | 0.0012** |
| Family | | | 0.0001*** | 0.0011 |

| Cohorts | All | 2010 & 2018 |
|----------|--------|-------------|
| N | 79,496 | 45,464 |
| N Female | 23,271 | 13,643 |
| N Male | 56,225 | 31,821 |

Table A5. The Effects of Family Situation on the Entrepreneurial Pipeline

Source: SINE survey. *Sample:* New firms founded in 2010, 2014, and 2018. This table analyzes the effects of the entrepreneur’s family situation choices made at different stages of the entrepreneurial pipeline. The dependent variables are entrepreneur’s gender *Female* (column 1), whether the entrepreneur is *High-growth oriented* (column 2), whether the startup is *Incorporated* (column 3), and whether the entrepreneur uses *VC* for the startup (column 4). Independent variables capturing the entrepreneur’s family situation are dummies variables if the entrepreneur has *Children* and if the entrepreneur lives is *Married* or lived in a spousal relationship. These variables are interacted with the entrepreneur’s gender in columns 1 to 3. All models include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. They also include county and 5-digit French SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

| Dependent variable: | Female entrepreneur | High-growth preference | Incorporated startup | VC |
|---------------------------|----------------------|------------------------|----------------------|---------------------|
| | (1) | (2) | (3) | (4) |
| Female | | -0.0387*** (0.01) | -0.0541*** (0.01) | -0.0014 (0.00) |
| Children | 0.0652*** (0.00) | 0.0118* (0.01) | 0.0260*** (0.01) | -0.0000 (0.00) |
| Female \times Children | | 0.0066 (0.01) | 0.0091 (0.01) | 0.0015 (0.00) |
| Married | -0.0487*** (0.01) | -0.0033 (0.01) | 0.0011 (0.01) | -0.0020** (0.00) |
| Female \times Married | | -0.0313*** (0.01) | -0.0013 (0.01) | 0.0002 (0.00) |
| Other controls | Yes | Yes | Yes | Yes |
| Sector \times Cohort FE | Yes | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes | Yes |
| R ² | 0.232 | 0.161 | 0.372 | 0.029 |
| N | 45,315 | 45,315 | 45,315 | 45,315 |
| Mean Dep. Var. | 0.300 | 0.336 | 0.633 | 0.003 |

Table A6. The Effects of Other Sources of Income on the Entrepreneurial Pipeline

Source: SINE survey. *Sample:* New firms founded in 2010, 2014, and 2018. This table analyzes the effects of the entrepreneur’s family situation choices made at different stages of the entrepreneurial pipeline. The dependent variables are entrepreneur’s gender *Female* (column 1), whether the entrepreneur is *High-growth oriented* (column 2), whether the startup is *Incorporated* (column 3), and whether the entrepreneur uses *VC* for the startup (column 4). Independent variables capturing the entrepreneur’s other sources of income are dummies variables if the entrepreneur has *No other income*, if the entrepreneur has access to *Spouse income*, and if the entrepreneur has other *Employment income* as an employee or as an independent worker. These variables are interacted with the entrepreneur’s gender in columns 1 to 3. All models include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. They also include county and 5-digit French SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

| Dependent variable: | Female entrepreneur | High-growth preference | Incorporated startup | VC |
|---|---------------------|------------------------|----------------------|-------------------|
| | (1) | (2) | (3) | (4) |
| Female | | -0.0523*** (0.01) | -0.0417*** (0.02) | -0.0010 (0.00) |
| No other income | 0.0055 (0.01) | 0.0138* (0.01) | -0.0063 (0.01) | 0.0001 (0.00) |
| Female \times No other income | | -0.0026 (0.02) | 0.0169 (0.01) | -0.0008 (0.00) |
| Spouse income | 0.0205*** (0.01) | -0.0154* (0.01) | -0.0016 (0.01) | -0.0003 (0.00) |
| Female \times Spouse income | | 0.0234* (0.01) | -0.0151 (0.01) | -0.0009 (0.00) |
| Other employment income | 0.0017 (0.01) | 0.0378*** (0.01) | 0.0140 (0.01) | -0.0006 (0.00) |
| Female \times Other employment income | | -0.0069 (0.02) | 0.0060 (0.02) | -0.0008 (0.00) |
| Other controls | Yes | Yes | Yes | Yes |
| Sector \times Cohort FE | Yes | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes | Yes |
| R ² | 0.223 | 0.138 | 0.353 | 0.037 |
| N | 44,538 | 44,538 | 44,538 | 44,538 |
| Mean Dep. Var. | 0.287 | 0.340 | 0.638 | 0.003 |

Table A7. Reported Difficulties at Start

Source: SINE survey. *Sample:* New firms founded in 2010, 2014, and 2018. This table uses OLS to test whether male and female entrepreneurs report different difficulties associated with the creation of the new firm. The dependent variables are the difficulty items that stem from the survey question “What are the main difficulties you faced during the startup creation process?”. The main independent variables are the entrepreneur’s gender, *Female*. All models include the baseline human capital and start-up control variables, which are defined in the variable definition appendix. They also include county and 5-digit French SIC sector \times cohort-year fixed effects. Clustered standard errors at the sector level are reported in parentheses. *, **, and *** indicate significantly different from zero at the 10, 5, and 1% levels, respectively.

| Reported Difficulties: | None (1) | Getting financing (2) | Opening bank account (3) | Getting bank overdraft (4) | Hiring skilled workers (5) | Finding clients (6) | Administrative tasks (7) | Being alone (8) |
|--------------------------------|----------------------|--------------------------|-----------------------------|-------------------------------|-------------------------------|------------------------|-----------------------------|----------------------|
| Female | 0.0013 (0.01) | -0.0295*** (0.01) | 0.0011 (0.00) | 0.0015 (0.00) | -0.0022 (0.01) | 0.0150* (0.01) | -0.0022 (0.01) | -0.0175*** (0.01) |
| Incorporated | -0.0031 (0.00) | 0.0015 (0.00) | 0.0074*** (0.00) | 0.0138*** (0.00) | 0.0509*** (0.00) | -0.0267*** (0.01) | 0.0191*** (0.01) | -0.0098** (0.00) |
| Female \times Incorporated | -0.0182*** (0.01) | 0.0250*** (0.01) | 0.0019 (0.00) | 0.0096* (0.00) | 0.0012 (0.01) | -0.0135* (0.01) | 0.0041 (0.01) | 0.0106 (0.01) |
| Age \geq 40 | 0.0674*** (0.00) | -0.0075** (0.00) | 0.0012 (0.00) | 0.0077*** (0.00) | -0.0125*** (0.00) | -0.0392*** (0.00) | -0.0584*** (0.00) | -0.0222*** (0.00) |
| French national | 0.0210*** (0.01) | -0.0100 (0.01) | -0.0579*** (0.00) | -0.0183*** (0.00) | -0.0279*** (0.00) | -0.0138** (0.01) | 0.0257*** (0.01) | -0.0304*** (0.01) |
| Undergraduate | -0.0309*** (0.00) | -0.0066 (0.01) | -0.0072** (0.00) | -0.0012 (0.00) | 0.0034 (0.00) | 0.0234*** (0.00) | 0.0223*** (0.01) | 0.0252*** (0.00) |
| Graduate | -0.0224*** (0.00) | -0.0259*** (0.00) | -0.0087*** (0.00) | -0.0169*** (0.00) | 0.0070* (0.00) | 0.0266*** (0.01) | 0.0287*** (0.01) | 0.0496*** (0.00) |
| Grande ecole | 0.0058 (0.01) | -0.0058 (0.01) | -0.0006 (0.00) | -0.0188*** (0.00) | 0.0015 (0.01) | 0.0173** (0.01) | 0.0009 (0.01) | 0.0241*** (0.01) |
| Industry expert | 0.0112*** (0.00) | -0.0244*** (0.00) | -0.0078*** (0.00) | -0.0016 (0.00) | 0.0070** (0.00) | -0.0248*** (0.00) | 0.0329*** (0.00) | -0.0211*** (0.00) |
| Serial entrepreneur | 0.0601*** (0.00) | 0.0087*** (0.00) | 0.0008 (0.00) | 0.0283*** (0.00) | 0.0390*** (0.00) | -0.0523*** (0.00) | -0.0582*** (0.00) | -0.0277*** (0.00) |
| Co-founder(s) | 0.0020 (0.00) | 0.0365*** (0.00) | 0.0024 (0.00) | 0.0071*** (0.00) | 0.0187*** (0.00) | -0.0142*** (0.00) | 0.0277*** (0.00) | -0.1079*** (0.00) |
| High-growth oriented | -0.0314*** (0.00) | 0.0765*** (0.00) | 0.0062*** (0.00) | 0.0306*** (0.00) | 0.0902*** (0.00) | -0.0229*** (0.00) | -0.0011 (0.00) | -0.0142*** (0.00) |
| Innovative business | -0.0736*** (0.00) | 0.0603*** (0.00) | 0.0088*** (0.00) | 0.0200*** (0.00) | 0.0183*** (0.00) | 0.0077* (0.00) | 0.0369*** (0.00) | 0.0296*** (0.00) |
| Sector \times Cohort year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| County FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| R ² | 0.064 | 0.079 | 0.039 | 0.045 | 0.092 | 0.050 | 0.041 | 0.058 |
| N | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 | 79,276 |
| Mean Dep. Var. | 0.224 | 0.214 | 0.067 | 0.078 | 0.096 | 0.197 | 0.402 | 0.164 |