Female Skin in the Game: Bridging the Gender Financing Gap

Kristine Sahakyan*

Abstract

I examine the role of skin in the game, such as paid-up equity or collateral, in narrowing the gender financing gap in entrepreneurship. I find, first, that skin in the game reduces this gap: a 10 percent increase in collateral value raises bank debt by around 4 percent for women—twice as much as for men. Similarly, one standard deviation increase in paid-up equity ratio (46 percentage points) boosts bank debt by 6.22 percent more for female-owned firms, or at least 1.7 times more than for men. This aligns with cross-country evidence that more equal property rights are linked to better access to credit for women and improved conditions for female entrepreneurship. Second, I find the return on investment from an additional dollar of debt is higher for women, implying that women face more significant financial constraints and forgo higher NPV projects. The economic magnitude is large: for a female-owned business with one standard deviation larger leverage, the performance gap (2 percentage points lower ROA for females) shrinks by at least 60 percent. My findings imply that policies like subsidizing unsecured credit or increasing collateral availability for women (e.g., through property rights) could help reduce the gender financing gap.

JEL Codes: G21, J16, L26

Keywords: Gender gap, entrepreneurship, bank debt, collateral, paid-up equity

*PhD candidate at ESCP Business School, Visiting Scholar at Kellogg School of Management, Northwestern University. E-mails: kristine.sahakyan@edu.escp.eu, kristine.sahakyan@kellogg.northwestern.edu

1 Introduction

The entrepreneurial gender gap is a well established fact. Women are underrepresented in entrepreneurship with only 2 percent of venture capital going to women-led start-ups globally.[1] A growing literature documents difficulties for women to raise project financing as a major cause of the gap, both for equity in venture capital as well as debt from financial institutions.[2] At the same time, progress in closing the entrepreneurial gender gap has been sluggish: Ewens (2022) observes that improvement is minimal over the last decade, with rates of convergence suggesting it will take at least another three decades to reach equality.

In this paper, I study the role of one's personal stake in an entrepreneurial investment, or *skin in the game*, in bridging the gender financing gap in one particular form of financing: debt from financial institutions (banks, hereafter). This question is important for several reasons. First, as already discussed, the funding gap is large. Second, bank financing is a major source of small business formation.[3] Finally, the results have implementable policy implications discussed below. In short, I find that increased skin in the game—either in form of pledging more collateral or more paid-up equity—can help reduce the funding gap.

Theoretically, more skin in the game will incentivize banks to increase financing for all groups of borrowers. Yet this effect well may be stronger for women compared to men, irrespective of whether the existing financing gap is due to rational reasons (Phelps, 1972; Arrow, 1973) or biased decision making (Bohren et al., 2019; Becker, 1957). First, according to theories of statistical discrimination (Phelps, 1972; Arrow, 1973), various groups can have different qualities, and in the absence of individual-level information on true qualities, observable group characteristics (such as race or gender) will determine outcomes (such as wages or loan terms). It is well established how such individual-level asymmetric information can be reduced in credit markets by

[1] Pitchbook reports share of female-only founded startups was just 2 percent in 2023—lowest since 2016. Additionally, while female co-founded VC capital is increasing, it remains low at 20.7 percent of total US VC funding. See https://pitchbook.com/news/articles/female-founders-vc-year-in-review-2023). In Europe, 1 percent of women account for venture capital investments. See European Investment Bank's 2022 March report.

[2] See for instance Hebert (2020), Hellmann et al. (2021) for VC, and (de Andrés et al. (2021), Ongena and Popov (2016) for debt. For policy discussion, see European Investment Bank https://www.eib.org/en/events/access-to-finance-for-female-entrepreneurs-creating-opportunity. For a review of academic literature, see Ewens (2022). In the latter, Table 1 in particular provides a summary of the entrepreneurship gap at the various stages of a start-up's cycle.

[3] Commercial bank loans provide 19 percent of all financing for small businesses, and for comparison, venture capital investments provide 2 percent. Other major sources include principal owner's equity (31 percent) and trade credit (16 percent). See Berger and Udell (1998).

either asking for *more collateral* to signal good project quality (Bester, 1985; adverse selection) or *more equity* to commit to working hard (Holmström and Tirole, 1987; moral hazard).

Second, if banks are making biased decisions, whether due to inaccurate statistical discrimination (Bohren et al., 2019) or taste-based discrimination (Becker, 1957), the biases result in lenders providing less funding, or they demand more equity for a given amount of funding Ewens (2022).

Thus, I begin by studying whether the availability of more skin in the game will increase female-led firms' bank credit *more* than for their male counterparts. To measure skin in the game, I first use pledgeable collateral, as measured by real estate in the firm. As a second measure I use personal equity used at the initial stages of founding—paid-up equity.

For my empirical tests I utilize a unique Norwegian dataset covering the universe of Norwegian firms from their year of incorporation, their financial statements merged with shareholder registry data, which provides details on the share structure, each shareholder's gender and age information, paid-up equity at the starting and follow-up years.

Studying the impact of skin in the game on reducing the gap in bank credit supply can be empirically challenging. Identifying the supply of credit is hard since I do not observe credit application and approval amounts, and therefore both unobserved demand factors as well as confounding supply factors may bias the estimates. The identification assumption is that there are no unobservable unmodelled factors that will impact the amount of debt borrowed, and *more so* for female entrepreneurs who *also* have high skin in the game. Put differently, identification requires that conditional on controls, any factors that are correlated with the availability of skin in the game should not impact entrepreneurs' borrowed bank debt in a manner that is also correlated with gender. Importantly, the correlation of skin in the game (or gender) separately with unobserved variables is not problematic for my identification assumption.

I show that both collateral and paid-up equity play an important role for long-term (as well as total) debt of young firms. My main findings are as follows: a 10 percent increase in the value of real estate is associated with about 4 percent increase in long-term bank debt for female-owned businesses. The result is the same for total debt: In fact, I mostly find no effect of collateral

on short-term debt. The intensity of this collateral channel is twice as large for women as for men during the first three years following a firm's establishment, yet this relative gender effect is reduced in the later stages of a firm's life.

To measure the impact of personal equity, I construct the variable *skin ratio* or *equity ratio*: the ratio of lagged paid-up equity on total assets. I find that for young single-owned firms an additional 1 standard deviation increase in equity ratio (equivalent to a change of 0.46 in the ratio) generates an additional 5.54 percent increase in long-term debt from banks.

Is banks' decision to suppress supply of funds to women rational? Statistical discrimination with correct (rational) beliefs suggests that lenders perceive gender as an indicator of certain borrower attributes (lower quality in terms of creditworthiness) that are not visible to the researcher, yet they exist and are apparent to the bank. According to this theory, banks provide less credit because they expect female owners to perform worse, and they do so correctly. To shed light on this, I study female and male firms' ex-post performance: return on assets (ROA) and revenue volatility in the initial years as well as over the entire life. I find evidence that female borrowers show only 1-2 percent lower ROA controlling for observables, and I find no evidence that their sales are riskier compared to males.

Importantly, however, I show that female borrowers who receive more bank debt perform better in the following year: they have higher ROA, and, at the same time, are not riskier in terms of sales volatility. Specifically, the marginal dollar of debt is used in a project with a ROA in a female-owned firm compared to a male-owned firm. Assuming there are no confounding unobservable factors that could increase returns, *and* more so for women, *and* correlate with having more (lagged) debt, this result means female entrepreneurs are more constrained; if they had received more credit, they would have carried out projects with *higher NPV*. The economic effect is large: a one-standard-deviation higher leverage reduces the performance gap between 60 and 80 percent. Therefore, this finding does not lend credence to rational choice by banks.

I then conduct robustness and placebo tests, as well as shed light on external validity. To make sure my results are not driven by tiny firms with a single founder who is also the employee, I conduct several robustness tests by leaving candidate small firms out. Specifically, I omit small single-owned firms employing only one individual, as well as firms with assets and sales falling

below the 10th percentile of their respective distributions. My results change to a negligible extent only. I also conduct "leave-one-industry-out" exercise, and observe that my results are not sensitive to the inclusion or exclusion of certain industries. For the collateral channel, I then use intangible assets as a placebo and find it has no pronounced effect on borrowed debt for women. Moreover, for short-term debt as outcome variable, I also find mostly insignificant results, in line with real estate being more important for long-term debt.

Finally, I collect cross-country information on property rights and entrepreneurship from the World Bank. While I am not able to establish causality here, the evidence I find further corroborates my main findings: property right improvements for women are associated with better entrepreneurial environment for them, including getting credit.

My findings have important policy implications. Around the world banks lend to female entrepreneurs less than to male entrepreneurs (Demirgüç-Kunt et al., 2018). Discrimination by lenders can indeed constrain supply of credit to women (Organisation for Economic Co-operation and Development (OECD), 2016). If female entrepreneurs are prohibitively credit-constrained, this can leave their talent unused and affect unfavorably on productivity and growth (Hsieh et al., 2019). As long as such a gap comes from the supply, policymakers can then improve the inefficiency.

My findings show that a more equal approach across genders can be crucial when designing policies such as property or inheritance rights. These have implications for small businesses' access to external funds. As an additional unit of skin is more important for women (who currently have more inferior property rights across the globe), moving towards equality may well increase total entrepreneurship.

While there might be arguments for as well as against supporting general policies aimed at promoting equal property rights, my findings suggest that initiatives aimed at fostering entrepreneurship would be more effective if they specifically incorporate the larger financing hurdles faced by women, who are more reliant on collateral or equity for starting business.

2 Related literature

My study is closely related to research on discrimination in small business financing via bank loans. Worldwide, banks extend less lending to female entrepreneurs compared to their male counterparts (Demirgüç-Kunt et al., 2018). Alesina et al. (2013) demonstrate significant disparities in credit supply (specifically, credit costs) for female entrepreneurs using data from Italy. Bellucci et al. (2010) found that female business owners in Italy face more challenges in obtaining credit compared to men, although the costs of the credit they obtain are comparable. Interestingly, by examining the relationship between the genders of borrowers and loan officers, they find that male loan officers are likely to require more collateral from female borrowers. Similarly, Brock and De Haas (2023) find, through a lab-in-the-field experiment, that loan officers are 26 percent more likely to require a guarantor when the same credit application is from a female, rather than a male entrepreneur.

Using, Kauffman Firm Survey (KFS), Coleman and Robb (2009) examine financing choices at the founding stage focusing on within-industry analysis.[4] Consistent with my data, they find that businesses owned by women tend to raise lower debt following the starting year, and are more inclined to utilize personal financing compared to businesses owned by men. These results are also in line with findings in Fairlie and Robb (2009) and Constantinidis et al. (2006).

Ongena and Popov (2016) use information on approximately 6,000 small business entities across 17 countries and find that in countries with more pronounced gender bias, women entrepreneurs are more inclined to abstain from even *applying* for loans and instead turn to informal financing options.[5] The authors fail to attribute the finding to discriminatory practices or differences in credit risk between businesses owned by women and men.[6] The lower propensity to apply due to fear of rejection, coupled with potential disparities in loan approval rates and conditions, points toward significant impediments that marginalized groups face when trying to get credit for their small businesses.

[4] Initiated in 2004 and continuing until 2011, the KFS tracks the development of newly established businesses in the United States.

[5] Similar results on women's relative reluctance to apply for credit was also documented in Coleman (2002).

[6] Similar findings are present in the context of black entrepreneurs. In particular, Fairlie et al. (2022) also reveal a strong predisposition among black borrowers towards expecting credit application rejections, which deterred them from applying. They also document a higher rate of loan denials for them, controlling for creditworthiness, educational background, wealth, and sectoral affiliation.

Discrimination is also present in minority groups, such as based on ethnicity. Supporting the notion of discrimination within lending markets, Chatterji and Seamans (2012) demonstrate that external enhancements in credit card debt accessibility result in increased entrepreneurial ventures among black entrepreneurs. In their seminal work, Blanchflower et al. (2003) pioneered the empirical investigation into discriminatory practices in small business lending. Through an analysis of data procured from the 1993 and 1997 National Surveys of Small Business Finances, they examined the interplay between racial identity and expectations regarding loan rejection, as well as actual outcomes related to lending. Finally, using KFS data Fairlie et al. (2022) examine how black entrepreneurs navigate initial financing challenges over time. They find that black entrepreneurs face difficulties in securing debt persists for up to eight years following the establishment of the firm, indicating that neither additional information nor experience in managing the business helps to mitigate this financial disparity.

My work is related to the literature on the availability of collateral values, access to credit, and entrepreneurship. Naaraayanan (2022) examines the impact of reforms that increase inheritance rights for women in entrepreneurship. He finds that these reforms alleviate financial constraints and promote female entrepreneurship without compromising the quality of new businesses, in a setting where significant social costs of starting a female-led business are present. I explore a different question in a different setting. I show that the availability of both collateral and equity allows women to get more bank financing. In addition, I show women are more financially constrained and in equilibrium forgo higher NPV projects, compared to men – in a country that boasts a strong commitment to gender equality.

Firm borrowing and investments can increase if collateral values increase (Chaney et al., 2012). Changes in collateral values can also spur spillover effects and have macroeconomic implications (Campbell et al., 2009; Benmelech and Bergman, 2011). Schmalz et al. (2017) find that house price growth can boost external funding and encourage entrepreneurship. Similar to my work, Kerr et al. (2022) study the impact of collateral on entrepreneurship for different groups of population based on their financial position: the role of collateral is less significant in the broader context of the impact of house price growth on business startups. For individuals with financial constraints, the growth in home equity plays a crucial role in enabling more sustained

business ventures. In my setting, I instead have borrowers that face more constraints due to discrimination, rather than a different position in their home leverage. I further show that as women assume more debt when providing more collateral, they carry out projects with higher NPV.

3 Hypotheses Development

Gender biases are one of the key reasons for differential access to finance (Ewens and Townsend, 2020). They may exist due to taste-based discrimination (Becker, 1957), or incorrect beliefs about women's qualities — statistical discrimination with incorrect beliefs (Bordalo et al., 2016; Ewens and Townsend, 2020). Alternatively, differential treatment of various groups may be rational, as in the case of classical statistical discrimination, where beliefs about varying group qualities are correct (Phelps, 1972; Arrow, 1973). Whether banks have an incorrect bias against lending to women or they are correctly perceived to have less promising projects, women will be at a disadvantage in getting financial resources. In either case, the gap should be reduced if female entrepreneurs can provide their own stake in the project: 1) collateral pledged against borrowing from banks, or 2) their own equity financing. In the first case, under the assumption that discrimination can be compensated by providing more collateral or equity (or higher interest rates, which I do not observe), lending to women will increase.[7] In the second case, if financiers' skepticism comes from a lack of trust in entrepreneurial abilities or project qualities, high-ability entrepreneurs can provide more collateral to signal their quality.[8] Indeed, the willingness to invest personal resources will signal the entrepreneur's commitment to the venture and the quality of the business opportunity. This effect will be stronger where asymmetric information is more severe and should ceteris paribus lead to more financing for women compared to men.

Hypothesis 1. The impact of collateral (in the form of real estate assets) on enhancing borrowing capacity is stronger for female entrepreneurs than for their male counterparts.

Hypothesis 2. The impact of personal equity (represented by the skin ratio) on enhancing

[7] Borrowing the term from psychology, Becker (1957) redefines discrimination based on individuals' actions: they will pay directly or indirectly to be associated with some groups instead of others. This can lead to either investing less capital, increasing interest rates, demanding more equity, not hiring or paying lower wages. See the discussion on discrimination in Ewens (2022).

[8] Theoretical literature has demonstrated the role of own resources in ameliorating asymmetric information problems. See Bester (1985) and Holmstrom and Tirole (1997) for collateral and equity, respectively.

borrowing capacity is stronger for female entrepreneurs than for their male counterparts.

4 Data

I use data on Norwegian firms and firm owners from 2003 to 2020. I combine information from the universe of Norwegian firms' financial statements (P&L, balance sheet) with the Shareholder Register data (shareholder structure, personal information on shareholders, including age and gender, and their initial paid-up equity) from the Norwegian Tax Administration. The datasets are merged using a unique national firm identification number (organisasjonsnummer) that is consistent in all firm registries and is assigned to all firms registered in Norway as well as to their foreign institutional shareholders.

To construct my main sample of interest, I begin by identifying single-owned firms which have been functioning between 2003 and 2020. After data cleaning and excluding financial firms, my final sample of interest is comprised of 33,183 firms with 190,501 firm-year observations.

In my sample, only 18 percent of single-owned firms are owned by females (Table 1). These female-owned enterprises tend to be younger, are smaller in size, possess fewer real estate assets, and carry lower levels of debt from financial institutions, along with generally less leverage. Moreover, female owners of single-owned firms are typically younger, contribute a smaller absolute investment or *skin in the game*, yet display a higher inside equity-to-firm-size ratio or *skin ratio*.[9]

To capture the financing that firms borrow, I use short-term (<1 year), long-term (>1 year) and total debt from financial institutions. I define skin in the game as the amount of an owner's paid-up equity. Skin or equity ratio is defined as the ratio of the skin in the game on the total assets of the firm. I use commercial real estate as a proxy for available collateral.

For owners, I know their age and gender information. $Female$ is a dummy that takes a value of 1 if the owner of a single-owned firm is a female. For firms with multiple owners, I define a continuous variable of female ownership, which is the total share of a firm owned by female owners. Majority-female is a dummy that takes a value of 1 if the majority of a firm is female-

[9] Interestingly, very similar patterns are observed in Coleman and Robb (2009): they report lower levels of both debt and equity in initial years, with higher paid-up equity ratios.

owned. In addition to the gender of owners, I also control for owner's age. To control for firm characteristics I use firm age, firm size as measured by log of *Total assets*, log of *Sales*, *Leverage*, and profitability as measured by *ROA*.

For external validity checks I collect data on the rights of women, the extent of their financial independence, and entrepreneurial activity from World Bank databases: Gender Data Portal and Women, Business and the Law. The latter offers unique insights into how legal and regulatory environments affect women's economic opportunities. Specifically, I employ The Women, Business and the Law index or *WBL index*, a comprehensive measure developed by the World Bank to evaluate how laws and regulations affect women's economic opportunities in 190 economies around the world. The index is based on eight indicators that span various stages of a woman's working life: Mobility, Workplace, Pay, Marriage, Parenthood, Entrepreneurship, Assets, and Pension. Each of these indicators comprises questions that assess the legal differences between men and women, scoring economies on a scale from 0 to 100, where a higher score indicates more favorable conditions for women's economic participation. In addition to that general measure, I use WBL Entrepreneurship Indicator or *WBL Ent*, a metric ranging from 1 to 100, to assess how female-friendly the institutions are in initiating and managing a business. To proxy for gender equality in property ownership rights, I take a binary indicator, *Equal property rights*, (1 for yes; 0 for no). This metric assesses the absence of legal restrictions on property ownership and administration based on gender, including any disparities in the treatment of spousal property and cases where customary practices and judicial precedents influence legal systems.

5 Methodology and hypothesis development

I begin by analyzing bank debt from financial institutions at the beginning of start ups' lives, starting from their first three years. My baseline specification takes the following form:

$$y_{i,t} = \alpha + \beta X_{i,t-1} + \gamma Zi, t + \delta Zi, t \times C_{i,t-1} + \zeta C_{i,t-1} + \phi I_j + \psi Y_t + u_{i,t} \tag{1}$$

where X includes the characteristics that predict the amount of debt and Z is a zero-one variable for gender — dummy variable taking value one for female single owner, or majority female.

Outcome y is (log of) short-term, long-term or total debt from financial institutions. C stands for collateralizeable assets, as proxied by real estate, or skin ratio. Within X, I control for the owner characteristics (such as age), as well as firm characteristics, such as log of $Total\ assets$, log of $Sales$, $Leverage$, and profitability as measured by ROA.

If there are no unobservable omitted variables, outcomes and the variables are uncorrelated with the error term, then $\gamma < 0$ reveals discrimination (Ewens, 2022). However, typical real-world datasets used to estimate equation 1 rarely satisfy these conditions. For example, datasets typically have an omitted variables problem with unobservable factors that correlate with gender Z (e.g., risk preferences) or collateral (e.g., borrowers with more housing, more collateral, and more wealth, in general, could be coming from entrepreneurial families and may thus have favorable entrepreneurial skills). My focus is however on the interaction coefficient δ. To be able to identify the latter, one must make sure there are no unobservable factors that are not controlled for, and will impact the amount of debt borrowed by female entrepreneurs that also have high skin in the game. Put differently, there may be, first, demand factors that correlate with the interaction of gender and skin in the game. For instance, women that have more collateral demand more credit for some unknown reasons compared to other borrowers. If so, it would load on the interaction coefficient.

Second, banks may supply more funds to certain females for other unobservable reasons (such as unusually good qualities), but that is not related to rational or irrational discrimination. It would have to be that more skin in the game makes banks supply more credit and this effect is stronger for females because their higher collateral is related to a higher increase in their quality than in men's. I believe these assumptions are relatively light compared to identifying single coefficients and I rely on their holding when making my claims.

As an alternative to collateral, I study the impact of a lagged skin ratio on bank funding in male and female-owned enterprises. For hypothesis 2, I still use the specification as in equation 1, except that collateral is replaced by lagged skin ratio.

5.1 Identification

Due to limitations in my data, identification of the supply of credit to women is somewhat challenging: for instance, I do not observe credit application and approval amounts. Therefore, both unobserved demand and supply factors may bias the estimate. My identification assumption is that there are no unmodeled unobservable factors which will impact the amount of debt borrowed by female entrepreneurs that *also* have high skin in the game. Put differently, identification requires that conditional on controls, any factors that are correlated with the availability of skin should not impact entrepreneurs' borrowed bank debt in a manner that is also correlated with the gender. It is noteworthy, that for the identification of the interaction coefficient, the correlation between collateral (or gender) and unobserved variables is not problematic.

The assumption means that, first, there are no demand factors that correlate with the interaction of gender and skin in the game. For instance, rather than causing more supply, it is plausible that with more equity ratio or real estate, all entrepreneurs demand more credit, for instance because they have more ambitious projects. My identification assumption requires that even when true, this effect is not stronger for women than it is for men. Second, even if it is supply-driven, to make sure my coefficient reflects banks' supply response to skin in the game, the assumption means there are no unobservable supply factors that correlate both with gender and more, such as, for instance, unusually good qualities of entrepreneurs that are observable to the bank but not in the data. That is, it would have to be that more skin in the game makes banks supply more credit due to talent and this effect is stronger for females: larger skin is correlated with an increase in entrepreneurs' unobservable quality, *and* this increase in quality is stronger for women than for men. I believe these assumptions are relatively light compared to identifying single coefficients and I rely on their holding when making my claims.

6 Results

In this section I detail my main findings with respect to 1) the importance of collateral in reducing relative barriers to bank debt for women, 2) role of initial paid-up equity for female access to bank debt, and 3) performance of the firms.

6.1 Collateral

Table 2 illustrates the importance of collateral, proxied by the real estate in a firm. This table is done for single-owned firms, for whom a clear gender variable of the single owner is known. I find that collateral plays an important role in the long-term and total debt of young firms. My main finding is that although collateral facilitates access to financing from financial institutions for young firms, its significance is particularly pronounced for female entrepreneurs. Specifically, a 10 percent enhancement in the value of real estate is associated with approximately *2 percent larger* increase in bank debt in female-owned firms. This effect is approximately twice as big as the effect for males (i.e., for the latter 10 percent increase in collateral generates a 2 percent increase in total debt). I then move to multiple-owned firms, and define majority-female-owned firms, based on absolute majority. My results are confirmed in this sample, too. Finally, I find that collateral generally does not exert a significant influence on short-term debt financing. This finding is reassuring in terms of placebo, as typically real estate is pledged as collateral for borrowing long-term credit rather than short-term.

6.2 Equity

In addition to the collateral channel, I study the importance of skin in the game in the form of paid-up equity for single-owned firms. I find that for young single-owned firms, an additional 1 standard deviation increase in skin ratio (equivalent to a change of 0.46 in the ratio) brings about an additional 1.35 percent increase (respectively, 5.54, 6.22 percent) in short-term (respectively, long-term, total) debt from financial institutions (Table 6). For firms of all ages, the effect is more pronounced: 1 standard deviation increase in skin ratio (equivalent to a change of 0.49 in the ratio) in female-owned firms brings about an additional 3.07 percent increase (respectively, 6.96, and 9.05 percent) in short-term (respectively, long-term, and total) debt from financial institutions.

6.3 Performance

Could it be that eventually, firms give less credit to females for rational reasons? This discussion is closely related to theories of discrimination, which I extensively discuss following the results section. In this subsection, I provide performance results based on ROA and $Sales$

volatility.

In Table 4, I examine the performance and stability of single-owned firms, by the gender of the owner. Without taking into consideration financial constraints, I observe a 1-2 percent lower ROA for female-owned firms (in line with previous research). However, a key finding here is that women show higher ROA with higher leverage (Female*Leverage). This means that female entrepreneurs' marginal return from an additional unit of debt is higher: female entrepreneurs are more constrained, but can realize their existing *higher NPV* projects compared to their male counterparts, if more credit is provided. Taking this into consideration, one-standard-deviation higher leverage reduces the initial performance gap by at least 60 percent (about 80 percent), based on column 4 (column 6).[10] I also check if better performance is also associated with more risk-taking by female single owners. I find that with additional unit of debt female entrepreneurs still have lower sales volatility than their male counterparts.

In panel B I show that female-led firms are not riskier either, as measured by volatility of sales. Moreover, the interaction coefficient in columns 4-6 also shows that the marginal projects more indebted women carry out are neither riskier.

7 Robustness Checks

To address the concern that the observed differences in access to finance between female-owned and male-owned firms might be driven by inherent differences between these firms, rather than by the gender of the owner, I employ a propensity score matching (PSM) technique. This method allows for the comparison of firms that are similar in all observed characteristics except for the gender of the owner, thereby isolating the impact of gender on access to finance.

The propensity score is the probability of a unit being assigned to a particular treatment given a set of observed covariates. In this context, the treatment is being a female-owned firm. For the covariates, I include variables that are likely to influence both the likelihood of a firm being female-owned and its access to finance. These variables include firm size, sales, industry sector, real estate amount, skin ratio, as well as the age of the entrepreneur. I estimate the propensity scores using a logistic regression model, where the dependent variable is a binary indicator of

[10] I observe similar results for firms with multiple owners: the performance of majority-female-owned firms.

whether the firm is female-owned. After estimating the propensity scores, I use nearest neighbor matching—originally suggested by Rosenbaum and Rubin (1983)—to pair each female-owned firm with one male-owned firm that has the closest propensity scores. This matching is done without replacement to ensure that each control firm is used only once. The matching procedure effectively balances the covariates between the treated and control groups, since the standardized differences for each covariate after matching are less than 5% (unreported). The reduction in standardized differences after matching (Figure 2) demonstrates the effectiveness of the matching procedure in balancing the covariates between treated (female-owned) and control (male-owned) firms.

After matching, I re-estimate the impact of collateral value and paid-up equity on access to bank debt, focusing on the matched sample. This allows for a more accurate estimation of the gender effect by comparing firms that are similar in all other observed aspects. PSM results confirm the robustness of my initial findings—the intensity of the collateral channel is twice as large for women as for men during the first three years following a firm's establishment. It provides strong evidence that the observed differences in access to finance between female-owned and male-owned firms are not merely driven by other observable firm characteristics. By matching firms on a comprehensive set of covariates, this analysis isolates the gender effect and reaffirms the importance of collateral in improving access to finance for female entrepreneurs. This robustness check strengthens the validity of the policy recommendations aimed at reducing the gender financing gap.

8 External Validity

For the external validity checks I use the World Bank Group data on Women, Business, and the Law (WBL) that measures laws and regulations that affect women's economic opportunity in 190 economies. Specifically, I use the Women, Business and the Law: Entrepreneurship Indicator or *WBL Ent*, a metric ranging from 1 to 100, to assess the legal constraints faced by women in initiating and managing a business across 190 economies. This indicator is derived from an unweighted average of four key components, each contributing equally (25 points) to the overall score, thereby scaling the final result to 100. These components are as follows:

- The ability of a woman to legally sign a contract in an equivalent manner to a man, denoted as *"A woman can sign a contract."*
- The legal provision for a woman to register a business on the same terms as a man, referred to as *"A woman can register a business"* or just *"Register business."*
- The equality of opportunity for a woman to open a bank account as compared to a man, indicated by *"A woman can open a bank account"* or just *"Open account."*
- The presence of laws that explicitly prohibit discrimination in accessing credit on the basis of gender, captured by *"The law prohibits discrimination in credit access"* or just *"Get credit."*

To study gender equality in property ownership rights, I take a binary indicator, *Equal property rights*, (1 for yes; 0 for no). This metric assesses the absence of legal restrictions on property ownership and administration based on gender, including any disparities in the treatment of spousal property and cases where customary practices and judicial precedents influence legal systems.

I find that in countries where women and men enjoy equal rights to immovable property — referred to as Equal property rights — there exists a more conducive environment for female entrepreneurship, as assessed by WBL index[11], WBL Ent and its components. Table 8 demonstrates that in countries with equal property rights, the average Women, Business and the Law: Entrepreneurship Indicator is 25 points higher, amounting to one quarter of the maximum value of WBL Ent. The countries with equal property rights for women are 44 percent more likely to have laws explicitly forbidding gender-based discrimination in accessing credit.

9 Discussion and Policy Implications

My work currently has limitations not allowing us to directly test theories of discrimination. For instance, I am unable to accurately identify the gender of both parties in lending, or see loan applications and approvals. I believe my findings are generally supported by statistical

[11]The Women, Business and the Law index or WBL index (0-100) evaluates legal impacts on women's economic opportunities, using eight indicators to score gender disparities, where higher scores signify better conditions for women's participation.

discrimination with incorrect beliefs. To discuss why, I first quickly review the discrimination theories.

Taste-based discrimination, as conceptualized by Becker (1957) in his seminal analysis on the economics of discrimination, is defined as a bias or aversion towards a specific group driven by individual preferences or inclinations. This mode of discrimination arises from subjective biases, favoring one group to the detriment of another, *irrespective of the actual abilities* or attributes of the individuals concerned. Therefore, Becker's theory posits that individuals might be inclined to bear additional costs or forgo benefits as a trade-off for not interacting with certain groups, highlighting a willingness to absorb financial detriments to adhere to personal biases. This results in providing less capital or demanding more equity (Becker, 1957; Ewens, 2022) as well as, not hiring or paying lower wages, etc.

If this type of discrimination is present in my context, it could result in a deliberate reduction in credit supply to women. To ameliorate the consequences of such a bias women would need to provide more equity or collateral. This aspect of the model is key in empirical evaluations, suggesting that those who exhibit taste-based discrimination are willing to forego potential profits (Ewens (2022)). However, the model's predictions are challenging to test (Charles and Guryan (2008)).

But providing more equity and collateral is also consistent with theories of statistical discrimination. Indeed, statistical discrimination theory (i.e., with accurate beliefs) suggests that disparities in treatment across race or gender do not stem from personal bias (Phelps (1972), Arrow (1973), Aigner and Cain (1977)). It involves making decisions about individuals based on statistical averages or probabilities associated with the group to which those individuals belong, rather than their personal abilities. This type of discrimination arises when there is incomplete information about an individual's qualifications or productivity. Lenders or other decision-makers use group averages or stereotypes as a proxy for unknown individual characteristics. For example, if a banker believes that women, on average, do not have great enough projects or do not have a particular skill important for the company's success (adverse selection), or, that they may not work hard enough to succeed in a highly competitive environment (moral hazard), they might be less likely to extend credit to women, even when some individuals within the group

might possess the required skill level.

Statistical discrimination with incorrect beliefs also suggests that decision-makers use group averages or stereotypes to make judgments about individuals. However, these averages or stereotypes are based on inaccurate information (Ewens and Townsend (2020); Bordalo et al. (2016)). In either case, by providing more skin in the game, women can signal that they will work diligently (moral hazard, as in Holmstrom and Tirole (1997)) or signal their good project type (adverse selection, as in Bester (1985))—despite the higher average risk in their group—and thereby reduce informational frictions.

Two pieces of my findings taken together lend support to the presence of statistical discrimination with incorrect beliefs: the reduced effect of collateral for women over time, as well as higher performance by female-led firms *with more bank credit*. The first effect suggests that discrimination is likely to be statistical: as additional information becomes available, lenders gradually perceive the two groups as increasingly alike. Indeed, if there's initially greater information asymmetry for startups owned by females, as banks progressively attain more complete information for both groups, the process of reducing information asymmetry issues will be more pronounced for female-owned businesses.

Second, I find that after receiving more bank debt, female-owned firms perform better than male-owned ones. This means that females are more credit-constrained and the marginal (un)funded projects that females possess have a higher NPV. This contradicts rational or profit-maximizing behavior by banks, as it suggests that lenders inaccurately attribute lower quality to projects owned by females.

My research indicates that a nuanced strategy tailored to the needs of genders is essential for policymakers. Implementing policies like credit subsidies, including mortgage financing subsidies, or enhancing women's property rights will influence small enterprises' ability to secure external financing, particularly for women. Although there are strong reasons to advocate for (or against) broad policies designed to encourage home ownership or broader property rights for women, my results imply that efforts to stimulate entrepreneurship and job creation would be more successful if they explicitly address the greater financial obstacles encountered by groups more dependent on collateral or equity.

10 Concluding Remarks

In this paper, I study the role of skin in the game in diminishing the gender financing gap, with a particular focus on debt from financial institutions. My main finding is that providing more skin in the game—either in the form of collateral or paid-up equity—helps women to acquire funds *more* than men. This finding is also in line with my cross-country analysis of property rights changes and their impact on the entrepreneurial environment for women.

The study is important for several reasons. Firstly, the gender financing gap is sizeable. Secondly, bank financing continues to be a primary means for launching small businesses. Lastly, my findings have policy implications: the key implication is that supporting a more equal distribution of collateral—such as through moving to a more equal distribution of property rights—will increase access to credit for women. And because it will decrease access to credit for men to a lower extent, total credit may increase.

References

Aigner, D. J. and Cain, G. G. (1977). Statistical theories of discrimination in labor markets. Industrial and Labor Relations Review, 30(2):175–187.

Alesina, A., Lotti, F., and Mistrulli, P. E. (2013). Women, firms and the gender gap in Italy. The Quarterly Journal of Economics, 128(2):705–748.

Arrow, K. J. (1973). The theory of discrimination. Discrimination in Labor Markets, 3(10):3–33.

Becker, G. S. (1957). The Economics of Discrimination. University of Chicago Press.

Bellucci, A., Borisov, A., and Zazzaro, A. (2010). Does gender affect access to credit for small and medium enterprises in italy? Journal of Banking and Finance, 34(10):2379–2394.

Benmelech, E. and Bergman, N. K. (2011). Bankruptcy and the collateral channel. The Journal of Finance, 66(2):337–378.

Berger, A. and Udell, Gregory, k. . V. a. . T. (1998). The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle. Journal of Banking Finance, 22(6):613–673.

Bester, H. (1985). Screening vs. rationing in credit markets with imperfect information. American Economic Review, 75(4):850–855.

Blanchflower, D. G., Levine, P. B., and Zimmerman, D. J. (2003). Discrimination in the small-business credit market. The Review of Economics and Statistics, 85(4):930–943.

Bohren, J. A., Imas, A., and Rosenberg, M. (2019). The dynamics of discrimination: Theory and evidence. American Economic Review, 109(10):3395–3436.

Bordalo, P., Coffman, K., Gennaioli, N., and Shleifer, A. (2016). Stereotypes. The Quarterly Journal of Economics, 131(4):1753–1794.

Brock, J. M. and De Haas, R. (2023). Discriminatory lending: Evidence from bankers in the lab. American Economic Journal: Applied Economics, 15(2):31–68.

Campbell, J. Y., Giglio, S., and Pathak, P. (2009). Forced sales and house prices. Working paper, Harvard University.

Chaney, T., Sraer, D., and Thesmar, D. (2012). The collateral channel: How real estate shocks affect corporate investment. American Economic Review, 102(6):2381–2409.

Charles, K. K. and Guryan, J. (2008). Prejudice and wages: an empirical assessment of becker's the economics of discrimination. Journal of Political Economy, 116(5):773–809.

Chatterji, A. K. and Seamans, R. C. (2012). Entrepreneurial finance credit cards and race. Journal of Financial Economics, 106(1):182–195.

Coleman, S. (2002). Characteristics and borrowing behavior of small, women-owned firms: evidence from the 1998 survey of small business finances. Journal of Business and Entrepreneurship, 14(2):151–166.

Coleman, S. and Robb, A. (2009). A comparison of new firm financing by gender: evidence from the kauffman firm survey data. Small Business Economics, 33(4):397–411.

Constantinidis, C., Cornet, A., and Asandei, S. (2006). Financing of women-owned ventures: The impact of gender and other owner -and firm-related variables. Venture Capital, 8(2):133–157.

de Andrés, P., Gimeno, R., and Mateos de Cabo, R. (2021). The gender gap in bank credit access. Journal of Corporate Finance, 71(C):S0929119920302261.

Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., and Hess, J. (2018). The global findex database 2017: Measuring financial inclusion and the fintech revolution.

Ewens, M. (2022). Gender and race in entrepreneurial finance. Columbia Business School Working paper.

Ewens, M. and Townsend, R. R. (2020). Are early stage investors biased against women? Journal of Financial Economics, 135(3):653–677.

Fairlie, R. W., Robb, A., and Robinson, D. T. (2022). Black and white: Access to capital among minority-owned startups. Management Science.

Fairlie, R. W. and Robb, A. M. (2009). Gender differences in business performance: evidence from the characteristics of business owners survey. Small Business Economics, 33(4):375–395.

Hebert, C. (2020). Gender stereotypes and entrepreneur financing.

Hellmann, T. F., Mostipan, I., and Vulkan, N. (2021). Gender in start-up financing: Evidence from equity crowdfunding. Available at SSRN 3768361.

Holmstrom, B. and Tirole, J. (1997). Financial intermediation, loanable funds, and the real sector. The Quarterly Journal of Economics, 112(3):663–691.

Hsieh, C.-T., Hurst, E., Jones, C. I., and Klenow, P. J. (2019). The allocation of talent and us economic growth. Econometrica, 87(5):1439–1474.

Kerr, S. P., Kerr, W. R., and Nanda, R. (2022). House prices, home equity, and entrepreneurship: Evidence from us census micro data. Journal of Monetary Economics.

Naaraayanan, L. (2022). Women's inheritance rights and entrepreneurship gender gap. Working Paper. Unpublished manuscript.

Ongena, S. and Popov, A. (2016). Gender bias and credit access. Journal of Money, Credit and Banking, 48(8):1691–1724.

Organisation for Economic Co-operation and Development (OECD) (2016). Entrepreneurship at a Glance 2016. OECD Publishing.

Phelps, E. S. (1972). The statistical theory of racism and sexism. The American Economic Review, 62(4):659–661.

Rosenbaum, P. R. and Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. Biometrika, 70(1).

Schmalz, M. C., Sraer, D. A., and Thesmar, D. (2017). Housing collateral and entrepreneurship. The Journal of Finance, 72(1):99–132.

Table 1: Summary statistics

The table provides summary statistics for a sample of Norwegian single-owned firms and their owners from 2003 to 2020. Company age is defined as the number of years since a company's establishment. Total assets show the sum of current assets and fixed assets of the firm. Sales is the total value of goods and services sold. Paid-up equity is total paid-up equity in the company, calculated as share capital + share premium. Real estate is the value of real estate owned by the company. Leverage is calculated as debt-to-equity ratio. ROA is return on assets, calculated as net income over total assets of the firm. Female-owned is a dummy that equals to 1 if the firm has a female owner, and 0 otherwise. Owner's age is the age of the single owner. Skin in or skin in the game is the amount of an owner's paid-up equity. Skin ratio is the ratio of the skin in the game on total assets. All the variables are winsorized at 1%.

Panel A: All single-owned companies

	Mean	SD	p25	p50	p75	N
Company age	6.28	3.70	3.00	5.00	9.00	190501
Total assets	3801.52	59164.34	369.00	996.00	2657.00	190501
Sales	2437.22	8909.59	350.00	1140.00	2546.00	190501
Paid-up equity	324.79	3832.02	30.00	100.00	104.00	190501
Real estate	459.15	2946.32	0.00	0.00	0.00	190501
ST fin. debt	50.77	1189.17	0.00	0.00	0.00	190501
LT fin. debt	555.28	8830.63	0.00	0.00	0.00	190501
Total debt	605.97	9057.19	0.00	0.00	43.00	190501
Leverage	0.55	5.15	0.00	0.00	0.15	190501
ROA	0.01	0.62	-0.03	0.08	0.22	190501
ROE	0.41	1.74	0.01	0.24	0.62	190501
Female-owned	0.16	0.36	0.00	0.00	0.00	190501
Owner's age	49.83	10.83	42.00	50.00	57.00	190501
Skin in	279.00	1454.52	30.00	100.00	104.00	190501
Skin ratio	0.25	0.51	0.03	0.08	0.22	190501

Panel B: Comparison by gender of single-owner

	N_F	N_M	$Mean_F$	$Mean_M$	Difference	t-value
Company age	29986	160515	5.901	6.356	-0.455***	20.3
Total assets	29986	160515	1895.058	4157.670	-2262.612***	12.9
Sales	29986	160515	1834.673	2549.786	-715.113***	22
Real estate	29986	160515	257.498	496.824	-239.327***	20.5
Log(Real estate)	29986	160515	0.66	0.982	-0.322***	24.3
ST debt	29986	160515	23.137	55.937	-32.8**	3.8
LT debt	29986	160515	219.403	618.025	-398.623***	15.6
Total debt	29986	160515	242.501	673.875	-431.375***	15.75
Leverage	29986	160515	0.373	0.635	-0.262**	10.8
ROA	29986	160515	-0.045	0.018	-0.064***	14.4
Owner's age	29986	160515	48.633	50.052	-1.419***	22.15
Skin in	29986	160515	178.62	297.750	-119.132***	15.45
Skin ratio	29986	160515	0.311	0.233	0.079***	-21.25

Table 2: The effect of collateral for single-owned firms

The dependent variable is debt to financial institutions. In columns 1-3, I study young firms up to 3 years after the establishment. The dependent variable in column 1 is Log(ST debt), where ST debt is the short-term debt to financial institutions. The dependent variable in column 2 is Log(LT debt), where LT debt is the long-term debt to financial institutions. The dependent variable in columns 3-6 is Log(Total debt), where Total debt is the sum of short-term and long-term debt to financial institutions. Column 4 (column 5) shows results for firms up to 5 years (10 years) after the establishment. Column 6 shows results for firms of all ages. Log(Real estate) is used as a proxy for available collateral for the firm. Female is a dummy that takes value of 1 if the single owner of firm is a female. The Female*Log(Real estate) term shows results for the value of collateral for female-owned firms. Panel A (Panel B) shows results for firms with positive real estate, excluding (including) companies from construction sector. Panel C shows results for all firms, excluding construction sector. The specification includes company related controls, year and sector fixed effects. Robust standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5% and 10% level.

Panel A: Firms with real estate, excl. construction sector

	[1]	[2]	[3]	[4]	[5]	[6]
	Log[ST debt]	Log[LT debt]	Log[Total debt]			
Female	-0.063	-0.780*	-0.692*	-1.023***	-1.320***	-1.454***
	[0.227]	[0.414]	[0.413]	[0.296]	[0.221]	[0.204]
Log[Real estate]	0.065***	0.232***	0.203***	0.264***	0.413***	0.425***
	[0.025]	[0.047]	[0.045]	[0.031]	[0.022]	[0.020]
Female*Log[Real estate]	-0.004	0.232***	0.218***	0.239***	0.246***	0.256***
	[0.046]	[0.073]	[0.072]	[0.050]	[0.036]	[0.033]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1965	1965	1965	4184	8981	12209
Adjusted R^2	0.08	0.26	0.28	0.27	0.25	0.23

Panel B: All firms with real estate, incl. construction sector

	[1] Log[ST debt]	[2] Log[LT debt]	[3]	[4]	[5] Log[Total debt]	[6]
Female	-0.002	-0.923**	-0.738**	-0.727***	-0.903***	-0.945***
	[0.174]	[0.358]	[0.357]	[0.254]	[0.195]	[0.180]
Log[Real estate]	0.006	0.337***	0.312***	0.372***	0.498***	0.510***
	[0.016]	[0.032]	[0.031]	[0.022]	[0.015]	[0.014]
Female*Log[Real estate]	-0.011	0.157**	0.130**	0.116***	0.135***	0.142***
	[0.031]	[0.061]	[0.061]	[0.043]	[0.031]	[0.028]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4332	4332	4332	9164	19475	26439
Adjusted R^2	0.07	0.20	0.22	0.23	0.22	0.21

Panel C: All firms, excl. construction sector

	[1] Log[ST debt]	[2] Log[LT debt]	[3]	[4]	[5] Log[Total debt]	[6]
Female	0.001	0.002	0.006	-0.038**	-0.113***	-0.144***
	[0.011]	[0.022]	[0.024]	[0.018]	[0.015]	[0.014]
Log[Real estate]	0.069***	0.358***	0.362***	0.376***	0.388***	0.372***
	[0.009]	[0.016]	[0.016]	[0.010]	[0.007]	[0.006]
Female*Log[Real estate]	-0.014	0.084***	0.085***	0.071***	0.061***	0.064***
	[0.019]	[0.032]	[0.031]	[0.021]	[0.014]	[0.013]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	38212	38212	38212	68080	110666	129451
Adjusted R^2	0.04	0.24	0.24	0.25	0.26	0.26

Table 3: The effect of collateral for firms with multiple owners

The dependent variable is debt to financial institutions. In columns 1-3, I study young firms up to 3 years after the establishment. The dependent variable in column 1 is Log(ST debt), where ST debt is the short-term debt to financial institutions. The dependent variable in column 2 is Log(LT debt), where LT debt is the long-term debt to financial institutions. The dependent variable in columns 3-6 is Log(Total debt), where Total debt is the sum of short-term and long-term debt to financial institutions. Column 4 (column 5) shows results for firms up to 5 years (10 years) after the establishment. Column 6 shows results for firms of all ages. Log(Real estate) is used as a proxy for available collateral for the firm. Majority-female is a dummy that takes value of 1 if the majority of firm is female-owned. The Majority-female*Log(Real estate) term shows results for the value of collateral for majority-female owned firms. Panel A (Panel B) shows results for firms with positive real estate, excluding (including) companies from construction sector. Panel C shows results for all firms, excluding construction sector. The specification includes company related controls, year and sector fixed effects. Robust standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5% and 10% level.

Panel A: Firms with real estate, excl. construction sector

	[1]	[2]	[3]	[4]	[5]	[6]
	Log[ST debt]	Log[LT debt]	Log[Total debt]			
Majority-female	0.154	-2.130***	-1.981***	-1.802***	-1.902***	-1.814***
	[0.169]	[0.305]	[0.304]	[0.233]	[0.173]	[0.152]
Log[Real estate]	0.032*	0.144***	0.106***	0.151***	0.235***	0.302***
	[0.017]	[0.030]	[0.029]	[0.021]	[0.016]	[0.014]
Majority-female*Log[Real estate]	-0.017	0.486***	0.458***	0.372***	0.361***	0.338***
	[0.030]	[0.050]	[0.049]	[0.040]	[0.029]	[0.024]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6022	6022	6022	11924	23903	31070
Adjusted R^2	0.11	0.19	0.22	0.18	0.16	0.17

Panel B: All firms with real estate, incl. construction sector

	[1] Log[ST debt]	[2] Log[LT debt]	[3]	[4]	[5] Log[Total debt]	[6]
Majority-female	0.126	-1.139***	-0.966***	-0.579***	-0.430***	-0.428***
	[0.138]	[0.268]	[0.267]	[0.195]	[0.147]	[0.132]
Log[Real estate]	-0.014	0.314***	0.277***	0.338***	0.446***	0.483***
	[0.012]	[0.021]	[0.021]	[0.015]	[0.011]	[0.010]
Majority-female*Log[Real estate]	-0.023	0.246***	0.214***	0.133***	0.090***	0.067***
	[0.022]	[0.042]	[0.041]	[0.031]	[0.023]	[0.020]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12657	12657	12657	24644	49247	64565
Adjusted R^2	0.09	0.19	0.21	0.20	0.18	0.18

Panel C: All firms, excl. construction sector

	[1] Log[ST debt]	[2] Log[LT debt]	[3]	[4]	[5] Log[Total debt]	[6]
Majority-female	-0.007	-0.018	-0.032*	-0.071***	-0.127***	-0.140***
	[0.009]	[0.017]	[0.018]	[0.014]	[0.012]	[0.011]
Log[Real estate]	0.049***	0.252***	0.248***	0.268***	0.288***	0.306***
	[0.005]	[0.009]	[0.009]	[0.006]	[0.004]	[0.004]
Majority-female *Log[Real estate]	-0.007	0.181***	0.174***	0.120***	0.110***	0.105***
	[0.011]	[0.020]	[0.019]	[0.015]	[0.010]	[0.009]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	85030	85030	85030	141256	220934	256228
Adjusted R^2	0.05	0.23	0.24	0.25	0.25	0.26

Table 4: The effect of the paid-up equity

The dependent variable is debt to financial institutions. Column 1 and 4 show results for Log(ST debt), where ST debt is the short-term debt to financial institutions. Columns 2 and 5 show results for Log(LT debt), where LT debt is the long-term debt to financial institutions. Columns 3 and 6 show results for Log(Total debt), where Total debt is the sum of short-term and long-term debt to financial institutions. Column 1-3 show results for firms up to 3 years after the establishment (Young firms). Columns 4-6 show results for Firms of all ages. Skin ratio is the ratio of the paid-up equity to total assets. Female is a dummy that takes value of 1 if the single owner of firm is a female. Majority-female is a dummy that takes value of 1 if the majority of firm is female-owned. Panel A shows results for single-owned firms. Panel B shows results for firms with multiple owners. The specification includes company related controls, year and sector fixed effects. Robust standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5% and 10% level.

Panel A: Single-owned firms

	[1]	[2]	[3]	[4]	[5]	[6]
	Young firms			Firms of all ages		
	Log[ST debt]	Log[LT debt]	Log[Total debt]	Log[ST debt]	Log[LT debt]	Log[Total debt]
Female	-0.010	-0.035	-0.028	-0.055***	-0.144***	-0.171***
	[0.013]	[0.028]	[0.029]	[0.008]	[0.016]	[0.017]
Skin ratio	0.046***	-0.014	0.019	0.079***	0.051***	0.099***
	[0.009]	[0.020]	[0.021]	[0.007]	[0.010]	[0.012]
Female*Skin ratio	0.029*	0.117***	0.131***	0.061***	0.136***	0.175***
	[0.018]	[0.030]	[0.033]	[0.012]	[0.016]	[0.019]
Log[Real estate]	0.032***	0.370***	0.369***	0.024***	0.391***	0.383***
	[0.005]	[0.009]	[0.009]	[0.002]	[0.004]	[0.004]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	54259	54259	54259	190026	190026	190026
Adjusted R^2	0.05	0.25	0.26	0.05	0.28	0.28

Panel B: Firms with multiple owners

	[1]	[2]	[3]	[4]	[5]	[6]
	Young firms			Firms of all ages		
	Log[ST debt]	Log[LT debt]	Log[Total debt]	Log[ST debt]	Log[LT debt]	Log[Total debt]
Majority-female	-0.026**	-0.031	-0.053**	-0.065***	-0.123***	-0.159***
	[0.011]	[0.021]	[0.022]	[0.006]	[0.013]	[0.013]
Skin ratio	0.035***	-0.035**	-0.022	0.081***	0.054***	0.099***
	[0.009]	[0.016]	[0.017]	[0.006]	[0.008]	[0.010]
Majority-female*Skin ratio	0.079***	0.207***	0.262***	0.083***	0.188***	0.237***
	[0.017]	[0.027]	[0.031]	[0.012]	[0.015]	[0.018]
Log[Real estate]	0.016***	0.335***	0.322***	0.011***	0.375***	0.357***
	[0.003]	[0.006]	[0.006]	[0.001]	[0.002]	[0.002]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	109880	109880	109880	365304	365304	365304
Adjusted R^2	0.06	0.27	0.28	0.05	0.29	0.29

Table 5: Performance of single-owned firms

The dependent variable in Panel A is return on assets (ROA), as a measure of performance. The dependent variable in Panel B is Sales volatility, as a measure of risk. Column 1 and 3 show results for firms up to 3 years after the establishment. Columns 2 and 4 show results for firms up to 5 years after the establishment. Columns 3 and 6 show results for firms of all ages. Female is a dummy that takes value of 1 if the single owner of firm is a female. Leverage is defined as firm's debt-to-equity ratio. Female*Leverage term shows the efficiency of debt usage by female-owned firms. The specification includes company related controls, year and sector fixed effects. Robust standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5% and 10% level.

Panel A: Profitability

	(1) ≤ 3	(2) ≤ 5	(3) All	(4) ≤ 3	(5) ≤ 5	(6) All
Female	-0.016*	-0.019***	-0.009**	-0.017*	-0.019***	-0.010**
	[0.009]	[0.006]	[0.004]	[0.009]	[0.006]	[0.004]
Leverage	-0.003***	-0.003***	-0.002***	-0.004***	-0.003***	-0.002***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Female*Leverage				0.003***	0.002***	0.002***
				[0.001]	[0.001]	[0.001]
Log[Real estate]	-0.050***	-0.041***	-0.028***	-0.050***	-0.041***	-0.028***
	[0.001]	[0.001]	[0.000]	[0.001]	[0.001]	[0.000]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	54331	97581	190501	54331	97581	190501
Adjusted R^2	0.16	0.14	0.12	0.16	0.14	0.12

Panel B: Risk

	(1) ≤ 3	(2) ≤ 5	(3) All	(4) ≤ 3	(5) ≤ 5	(6) All
Female	-28.312	-6.205	30.005*	-22.437	-3.452	31.382*
	[21.088]	[18.145]	[18.029]	[21.157]	[18.258]	[17.565]
Leverage	-1.318	-3.870*	-5.706**	0.324	-2.994	-5.269**
	[2.819]	[2.005]	[2.628]	[3.228]	[2.244]	[2.686]
Female*Leverage				-11.776***	-6.664**	-3.457
				[4.115]	[3.228]	[6.285]
Log[Real estate]	-94.828***	-77.958***	-58.806***	-95.103***	-78.091***	-58.815***
	[9.769]	[8.298]	[5.337]	[9.782]	[8.306]	[5.338]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	54311	97554	190460	54311	97554	190460
Adjusted R^2	0.09	0.09	0.03	0.09	0.09	0.03

Table 6: Performance of firms with multiple owners

The dependent variable in Panel A is return on assets (ROA). The dependent variable in Panel B is Sales volatility. Column 1 and 3 show results for firms up to 3 years after the establishment. Columns 2 and 4 show results for firms up to 5 years after the establishment. Columns 3 and 6 show results for firms of all ages. Female is a dummy that takes value of 1 if the single owner of firm is a female. Leverage is defined as firm's debt-to-equity ratio. Majority-female*Leverage term shows the efficiency of debt usage by majority-female owned firms. The specification includes company related controls, year and sector fixed effects. Robust standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5% and 10% level.

Panel A: Profitability

	(1) ≤ 3	(2) ≤ 5	(3) All	(4) ≤ 3	(5) ≤ 5	(6) All
Majority-female	-0.058***	-0.034***	-0.013***	-0.061***	-0.036***	-0.014***
	[0.006]	[0.005]	[0.003]	[0.006]	[0.005]	[0.003]
Leverage	-0.002***	-0.001***	-0.001***	-0.002***	-0.002***	-0.001***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Majority-female*Leverage				0.004***	0.002***	0.001***
				[0.000]	[0.000]	[0.000]
Log[Real estate]	-0.049***	-0.041***	-0.027***	-0.049***	-0.041***	-0.027***
	[0.001]	[0.001]	[0.000]	[0.001]	[0.001]	[0.000]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	121362	203561	380740	121362	203561	380740
Adjusted R^2	0.15	0.14	0.11	0.15	0.14	0.11

Panel B: Risk

	(1) ≤ 3	(2) ≤ 5	(3) All	(4) ≤ 3	(5) ≤ 5	(6) All
Majority-female	-112.970***	-91.599***	-74.372***	-113.360***	-92.435***	-75.188***
	[19.417]	[15.819]	[14.859]	[19.484]	[15.885]	[14.586]
Leverage	-9.902***	-9.881***	-11.322***	-9.977***	-10.057***	-11.508***
	[1.640]	[1.356]	[1.664]	[1.804]	[1.471]	[1.708]
Majority-female*Leverage				0.638	1.550	1.660
				[2.972]	[2.568]	[3.851]
Log[Real estate]	-138.916***	-115.242***	-90.007***	-138.914***	-115.236***	-90.010***
	[7.901]	[6.644]	[4.367]	[7.901]	[6.644]	[4.367]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	88319	148604	276789	88319	148604	276789
Adjusted R^2	0.09	0.10	0.05	0.09	0.10	0.05

Table 7: Summary statistics of property rights and female entrepreneurship

The table shows summary statistics for key variables regarding rights of women and the extent of their financial independence and entrepreneurial activity. Equal property rights that takes value of 1 if women had equal ownership rights to immovable property. Women, Business and the Law: Entrepreneurship Indicator or WBL Ent assesses the legal constraints faced by women in initiating and managing a business. This indicator is derived from an unweighted average of four key components, each contributing equally (25 points) to the overall score, ranging from 1 to 100. Register business measures the legal provision for a woman to register a business on the same terms as a man. Open account measures the equality of opportunity for a woman to open a bank account as compared to a man. Get credit measures the presence of laws that explicitly prohibit discrimination in accessing credit on the basis of gender. The Women, Business and the Law index or WBL index (0-100) evaluates legal impacts on women's economic opportunities, using eight indicators to score gender disparities, where higher scores signify better conditions for women's participation. Number of female business owners refers to females who own at least a share in a newly registered limited liability company within a given calendar year. Share of female business represents the percentage of newly registered female-owned limited liability companies compared to the total of such entities registered in the economy within a calendar year. Firms with female ownership refer to the percentage of firms having at least one woman as a principal owner. Firms with female top manager refers to the percentage of firms who have females as top managers. Women who own house alone indicates the share of women aged 15-49 who solely own a legally registered house. Women who own a house jointly indicates the share of women aged 15-49 who have shared ownership of a house. Women who own land alone refers to the share of women aged 15-49 who exclusively own legally registered land in their name. Women who own land jointly refers the share of women aged 15-49 who share ownership of legally registered land.

	Mean	SD	p25	p50	p75	N
Equal property rights	0.86	0.35	1.00	1.00	1.00	4275
WBL Entrepreneurship Indicator	78.54	18.62	75.00	75.00	100.00	4275
A woman can sign a contract	0.28	0.45	0.00	0.00	1.00	4275
A woman can register a business	0.97	0.16	1.00	1.00	1.00	4275
A woman can open a bank account	0.95	0.22	1.00	1.00	1.00	4275
The law prohibits discrimination	0.94	0.23	1.00	1.00	1.00	4275
WBL Index	69.10	18.24	57.50	71.25	81.88	4275
Number of female business owners	8445.35	23115.92	642.00	2215.00	6556.00	223
Share of female business owners	21.73	9.20	15.03	21.16	29.76	223
Firms with female ownership	33.97	14.93	24.00	33.50	42.90	317
Firms with female top manager	18.21	9.37	12.10	17.40	23.60	231
Women who own a house alone	8.25	7.30	3.80	6.70	9.45	80
Women who own a house jointly	22.27	14.35	10.65	19.70	29.55	80
Women who own land alone	7.99	6.44	3.90	6.90	9.70	75
Women who own land jointly	16.07	11.87	6.10	14.60	24.50	75

Source: World Bank's Gender Data Portal and Women, Business and the Law.

Table 8: Property rights and female entrepreneurship

The table shows the correlation between property rights of women and female entrepreneurship. Women, Business and the Law: Entrepreneurship Indicator or WBL Ent assesses the legal constraints faced by women in initiating and managing a business. This indicator is derived from an unweighted average of four key components, each contributing equally (25 points) to the overall score, ranging from 1 to 100. Register business measures the legal provision for a woman to register a business on the same terms as a man. Open account measures the equality of opportunity for a woman to open a bank account as compared to a man. Get credit measures the presence of laws that explicitly prohibit discrimination in accessing credit on the basis of gender. The Women, Business and the Law index or WBL index (0-100) evaluates legal impacts on women's economic opportunities, using eight indicators to score gender disparities, where higher scores signify better conditions for women's participation. The independent variable in Panel A is *Equal property rights* that takes value of 1 if women had equal ownership rights to immovable property in country *i* in the previous year *t-1*. The independent variable in Panel B is *Introduction* that takes value of 1 if equal property rights were introduced in that country *i* in the previous year *t-1*. The specification includes country and year fixed effects. Robust standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5% and 10% level.

Panel A: Equal property rights

	[1] WBL Ent	[2] Register business	[3] Open account	[4] Get credit	[5] WBL index
Equal property rights	24.754***	0.362***	0.345***	0.441***	11.680***
	[2.870]	[0.040]	[0.041]	[0.043]	[1.054]
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Observations	4104	4104	4104	4104	4104
Adjusted R^2	0.81	0.80	0.87	0.89	0.93

Panel B: Introduction of equal property rights

	[1] WBL Ent	[2] Register business	[3] Open account	[4] Get credit	[5] WBL index
Introduction of equal property rights	13.064***	0.122***	0.108***	0.199***	5.039**
	[3.282]	[0.046]	[0.037]	[0.065]	[2.303]
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Observations	4104	4104	4104	4104	4104
Adjusted R^2	0.79	0.72	0.83	0.84	0.92

Table 9: The effect of collateral for single-owned firms - matched subsample

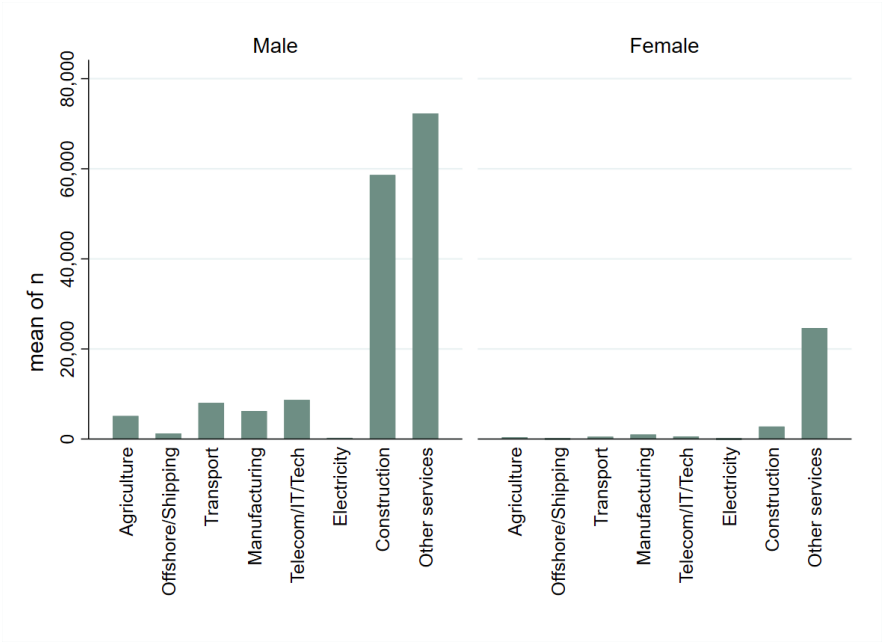
This table shows results for the subsample of female-owned and male-owned young firms (up to 3 years after the establishment) matched on firm size, sales, industry sector, real estate amount, skin ratio, as well as the age of the entrepreneur. The dependent variable is debt to financial institutions. The dependent variable in column 1 is Log(ST debt), where ST debt is the short-term debt to financial institutions. The dependent variable in column 2 is Log(LT debt), where LT debt is the long-term debt to financial institutions. The dependent variable in columns is Log(Total debt), where Total debt is the sum of short-term and long-term debt to financial institutions. Log(Real estate) is used as a proxy for available collateral for the firm. Female is a dummy that takes value of 1 if the single owner of firm is a female. The Female*Log(Real estate) term shows results for the value of collateral for female-owned firms. Table shows results for firms with positive real estate, excluding companies from construction sector. The specification includes company related controls, year and sector fixed effects. Robust standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5% and 10% level.

	Log[ST debt]	Log[LT debt]	Log[Total debt]
Female	0.127	-0.322	-0.271
	[0.284]	[0.476]	[0.480]
Log[Real estate]	0.042	0.183**	0.134*
	[0.047]	[0.082]	[0.080]
Female*Log[Real estate]	-0.036	0.198**	0.180**
	[0.055]	[0.087]	[0.087]
Firm controls	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes
Observations	972	972	972
Adjusted R^2	0.10	0.31	0.32

Appendix

Figure A1. Distribution of firms by sector and gender of the owner
The histogram in Panel A illustrates the number of single-owned firms across various sectors, categorized by the gender of the owner. The pie charts in Panel B show the distribution of female and male single-owned firms by sector.

Panel A



Panel B

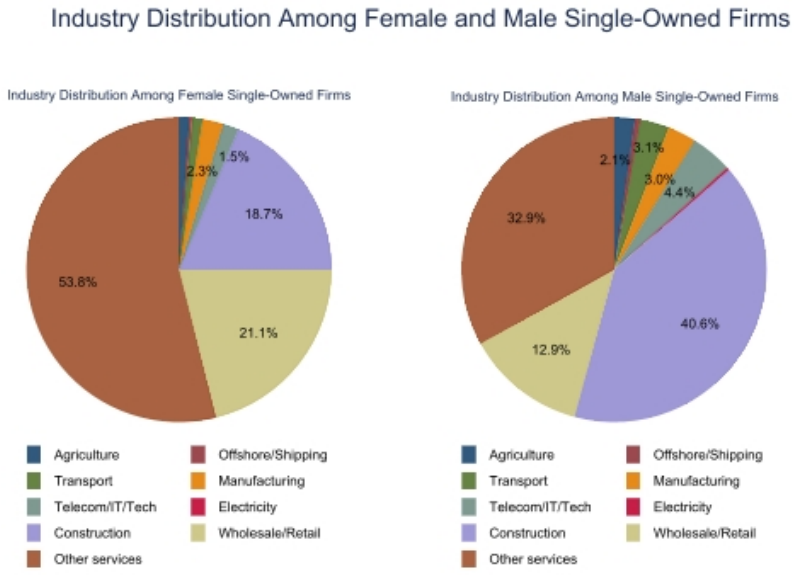


Figure A2. Standardized bias plot before and after matching
This plot displays the standardized differences for each covariate before and after propensity score matching. Black round points indicate the standardized differences before matching, while red triangles represent the differences after matching.

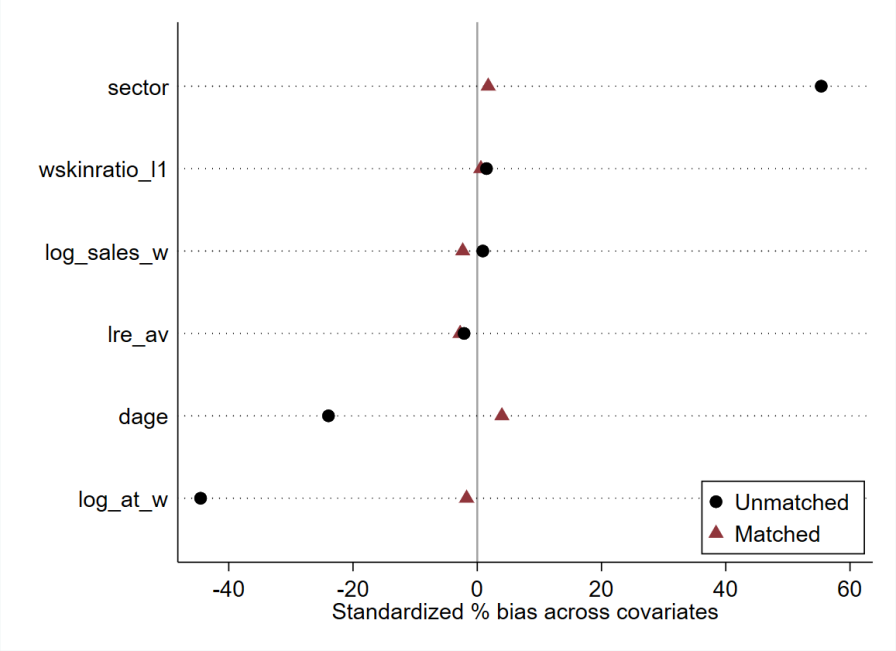


Figure A3. Propensity score histogram by treatment status
This histogram illustrates the distribution of propensity scores for treated (female-owned) and control (male-owned) firms. The graph shows how well the propensity scores overlap between the two groups, indicating the extent to which the matching procedure has balanced the covariates across treated and control firms.

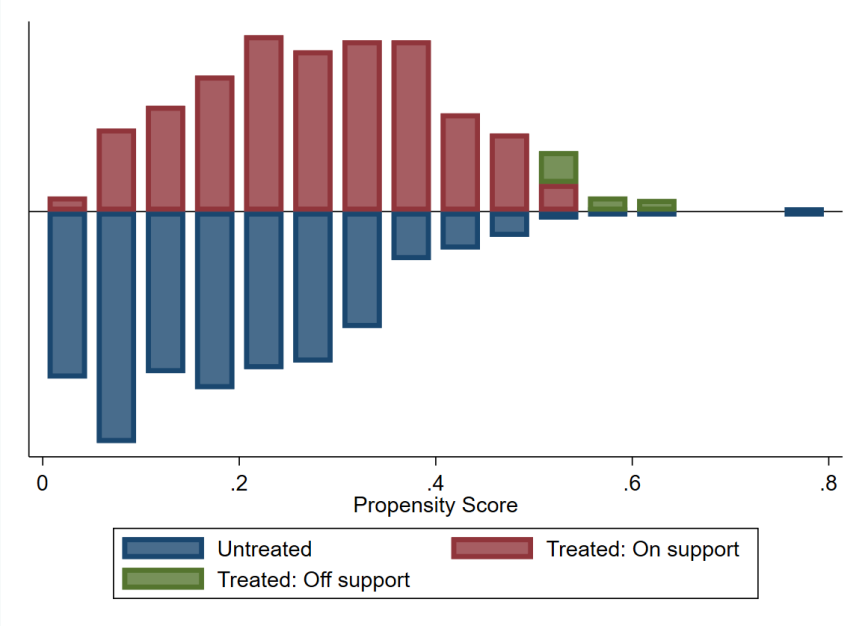


Table A1: Summary statistics for firms with multiple owners

The table provides summary statistics for a sample of Norwegian firms with multiple owners and their owners from 2003 to 2020. Company age is defined as the number of years since a company's establishment. Total assets show the sum of current assets and fixed assets of the firm. Sales is the total value of goods and services sold. Paid-up equity is total paid-up equity in the company, calculated as share capital + share premium. Real estate is the value of real estate owned by the company. Leverage is calculated as debt-to-equity ratio. ROA is return on assets, calculated as net income over total assets of the firm. Owner's age is the average age of the owners. Skin in or skin in the game is the amount of an owner's paid-up equity. Skin ratio is the ratio of the skin in the game on total assets.

	Mean	SD	p25	p50	p75	N
Company age	6.06	4	3.00	5	8	374158
Total assets	4515.46	70016	403.00	1119	3004	374158
Sales	3121.52	8197	392.00	1337	3335	374158
Paid-up equity	578.35	18467	30.00	100	115	374158
Real estate	632.06	3222	0.00	0	0	374158
Log(Real estate)	1.17	3	0.00	0	0	374158
ST fin. debt	64.68	1303	0.00	0	0	374158
LT fin. debt	736.83	7760	0.00	0	60	374158
Total debt	801.29	7976	0.00	0	135	374158
Leverage	0.78	5	0.00	0	0	374158
ROA	-0.01	1	-0.04	0	0	374158
Owner's age	48.51	12	40.00	48	57	374158
Skin in	215.88	1286	30.00	50	100	374158
Skin ratio	0.19	0	0.02	0	0	374158

Table A2: The effects of collateral and paid-up equity for not medium and large single-owned firms and their performance

I exclude small single-owned firms employing only one individual, as well as firms with assets and sales falling below the 10th percentile of their respective distributions. The dependent variable in Panel A is debt to financial institutions. Panel A shows results for firms with positive real estate. In columns 1-3, I study young firms up to 3 years after the establishment. The dependent variable in column 1 is Log(ST debt), where ST debt is the short-term debt to financial institutions. The dependent variable in column 2 is Log(LT debt), where LT debt is the long-term debt to financial institutions. The dependent variable in columns 3-6 is Log(Total debt), where Total debt is the sum of short-term and long-term debt to financial institutions. Column 4 (column 5) shows results for firms up to 5 years (10 years) after the establishment. Column 6 shows results for firms of all ages. Log(Real estate) is used as a proxy for available collateral for the firm. Female is a dummy that takes value of 1 if the single owner of firm is a female. The Female*Log(Real estate) term shows results for the value of collateral for female-owned firms. The dependent variable in Panel B is return on assets (ROA), as a measure of performance. The dependent variable in Panel B is Sales volatility, as a measure of risk. Column 1 and 3 show results for firms up to 3 years after the establishment. Columns 2 and 4 show results for firms up to 5 years after the establishment. Columns 3 and 6 show results for firms of all ages. Leverage is defined as firm's debt-to-equity ratio. Female*Leverage term shows the efficiency of debt usage by female-owned firms. The dependent variable in Panel C is debt to financial institutions. Column 1 and 4 show results for Log(ST debt), where ST debt is the short-term debt to financial institutions. Columns 2 and 5 show results for Log(LT debt), where LT debt is the long-term debt to financial institutions. Columns 3 and 6 show results for Log(Total debt), where Total debt is is the sum of short-term and long-term debt to financial institutions. Column 1-3 show results for firms up to 3 years after the establishment (Young firms). Columns 4-6 show results for Firms of all ages. The specifications includes company related controls, year and sector fixed effects. Robust standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5% and 10% level.

Panel A: Collateral

	[1]	[2]	[3]	[4]	[5]	[6]
	Log[ST debt]	Log[LT debt]	Log[Total debt]			
Female	0.060	-0.678	-0.582	-0.985***	-1.225***	-1.407***
	[0.243]	[0.468]	[0.465]	[0.329]	[0.251]	[0.232]
Log[Real estate]	0.030	0.359***	0.322***	0.318***	0.419***	0.439***
	[0.028]	[0.047]	[0.047]	[0.032]	[0.022]	[0.019]
Female*Log[Real estate]	-0.045	0.192**	0.179**	0.232***	0.231***	0.240***
	[0.044]	[0.077]	[0.077]	[0.053]	[0.039]	[0.036]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2032	2032	2032	4183	8546	11547
Adjusted R^2	0.08	0.21	0.22	0.23	0.23	0.22

Panel B: Performance

	(1) ≤ 3	(2) ≤ 5	(3) All	(4) ≤ 3	(5) ≤ 5	(6) All
Female	-0.020***	-0.014**	-0.012***	-0.020***	-0.013**	-0.011***
	[0.007]	[0.005]	[0.004]	[0.008]	[0.005]	[0.004]
Leverage	-0.002***	-0.001***	-0.001***	-0.002***	-0.001***	-0.001***
	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]
Female*Leverage				0.000	-0.000	-0.000
				[0.001]	[0.001]	[0.000]
Log[Real estate]	-0.023***	-0.019***	-0.014***	-0.023***	-0.019***	-0.014***
	[0.001]	[0.001]	[0.000]	[0.001]	[0.001]	[0.000]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19180	35131	71606	19180	35131	71606
Adjusted R^2	0.08	0.07	0.06	0.08	0.07	0.06

Panel C: Paid-up equity

	[1]	[2] Young firms	[3]	[4]	[5] Firms of all ages	[6]
	Log[ST debt]	Log[LT debt]	Log[Total debt]	Log[ST debt]	Log[LT debt]	Log[Total debt]
Female	-0.073**	0.022	-0.001	-0.128***	-0.174***	-0.241***
	[0.030]	[0.062]	[0.063]	[0.017]	[0.031]	[0.032]
Skin ratio	0.040	-0.511***	-0.451***	0.181***	-0.238***	-0.114***
	[0.039]	[0.077]	[0.079]	[0.026]	[0.038]	[0.041]
Female*Skin ratio	0.233**	0.306*	0.433**	0.241***	0.317***	0.483***
	[0.105]	[0.178]	[0.177]	[0.067]	[0.079]	[0.096]
Log[Real estate]	0.031***	0.307***	0.297***	0.043***	0.335***	0.329***
	[0.009]	[0.015]	[0.014]	[0.004]	[0.006]	[0.006]
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Owner controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19144	19144	19144	71478	71478	71478
Adjusted R^2	0.07	0.22	0.23	0.07	0.23	0.24

Table A3: Key variable definitions

Variable	Definition
Company age	Number of years since a company's establishment.
Equal property rights	Dummy variable equal to 1 if women have equal ownership rights to immovable property in a given country.
Female	Dummy variable equal to 1 if the owner of a firm is female.
Leverage	Debt-to-equity ratio of the firm, indicating financial risk.
Log(Real estate)	Natural log of the value of real estate, used as a proxy for collateral.
Majority-female	Dummy variable equal to 1 if the firm is majority-owned by women.
Owner's age	Age of the owner of the firm.
Paid-up equity	Total paid-up equity in the company, calculated as share capital plus share premium.
Real estate	Value of real estate owned by the company, used as collateral.
ROA (Return on Assets)	Measure of profitability, calculated as net income divided by total assets.
Sales	Total value of goods and services sold by the firm.
Skin in	Amount of an owner's paid-up equity in the firm.
Skin ratio	Ratio of the owner's paid-up equity to the total assets of the firm.
Total assets	Sum of current assets and fixed assets of the firm.
WBL Entrepreneurship Indicator	Composite score (0-100) assessing legal constraints for women in initiating and managing businesses.