Banking competition and gender debt bias: Evidence from China[1]

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Preliminary Version: January 2021

Abstract

Using the deregulation of banks' branching as a shock to the credit supply of privately-owned Chinese SMEs, we provide evidence that increased bank competition reduces the debt gender gap: female entrepreneurs are more likely to use debt financing after the deregulation. This effect does not depend on the provinces' banking concentration in the pre-deregulation period. We also document that local cultural biases shape how bank competition influences the gender debt gap. Indeed, female-led firms resort less to debt in provinces with high discrimination. Our results are robust to a battery of tests accounting for omitted variables, sample selection, alternative explanations, and variation in firm size.

Keywords: *Female entrepreneurs, debt, informal finance, formal finance, China, Gender*

JEL Classification: G30, J16, 016, 017

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[1] We are grateful to Federica Salvadé, Mascia Bedendo, Mattia Girotti, Iftekhar Hasan, Ornella Ricci, Claudia Girardone, Thomas Kuo, Nemanja Radic and to all the participants at the Seminars at the University of Essex, University of Cranfield, University of Birmingham, and 4th Conference on Contemporary Issues at the University of St Andrews, for insightful comments helpful comments and suggestions.

1. Introduction

Gender disparities continue to limit the stock of new businesses and reduce firms' economic potential. Although governments have adopted regulations to reduce gender inequalities, gender-related discrimination can still prevent women from properly capitalizing on economic opportunities in entrepreneurship (e.g., Alesina et al., 2013; Blau and Kahn, 2003, 2013, 2017; Moro et al., 2017). Access to external funding sources is among these well-documented obstacles, with female entrepreneurs relying less on credit than male entrepreneurs (e.g., Muravyev et al., 2009; Wu and Chua, 2012; Alesina et al., 2013; Asiedu et al., 2013; Mascia and Rossi, 2017; Campbell et al., 2019; Galli et al., 2020). Despite several studies have explored the effect of gender bias in credit market outcomes (e.g, loan denial rate, pricing and lending contractual conditions) and corporate debt choice,[2] the implications of banking competition on female entrepreneurs' corporate debt usage have received less attention.

Previous literature has shown that banking competition expands credit supply (Zarutskie, 2006; Rice and Strahan, 2010), eases firms' access to finance (e.g., Bertrand et al., 2007; Love and Pería, 2015; Gao et al., 2019; Chen et al., 2020), lowers costs and improving lending' efficiency (e.g., Beck et al., 2004; Cetorelli and Strahan, 2006; Bertrand et al., 2007; Carbo-Valverde et al., 2009; Rice and Strahan, 2010; Krishnan et al., 2015). Drawing on this literature,

[2] See for example Muravyev et al. (2009); Wu and Chua (2012); Alesina et al. (2013); Asiedu et al. (2013); Ongena and Popov (2016); Mascia and Rossi (2017); Campbell et al. (2019); Galli et al. (2020); De Andrés et al. (2020); and Delis et al. (2021) for credit market outcomes; and Huang and Kisgen (2013); Faccio et al. (2016); Datta et al. (2021) for corporate debt choices.

this paper adds to this line of research by providing nuanced evidence on whether banking competition may alleviate gender debt bias.

We hypothesize that a more vigorous banking competition can facilitate female entrepreneurs' access to the credit market and reduce the debt-gender gap. In fact, taste-based discrimination is an inefficient behaviour that can highly damage lenders if they forego potentially profitable opportunities to avoid interacting with a certain category of borrowers (Becker, 1971). A more competitive environment heightens the cost of not lending to women and should, therefore, alleviate prejudicial forms of discrimination from lenders.

To test the effect of competition on the relationship between gender and debt, we exploit the deregulation of the branching policy of joint equity shareholding banks (JEBs, hereafter) and city commercial banks (thereafter CCBs). This reform took place in China in 2009 as a plausibly exogenous shock increasing competition, and therefore the supply of credit available to small and medium enterprises (henceforth SMEs). The banking system in China is mainly dominated by five State-owned banks, but it also comprises JEBs and CCBs. In 2009 the China Banking Regulatory Commission (CBRC) allowed both JEBs and CCBs to freely open multiple branches in any city without any restrictions on their number, conditional on having already branches in that city or in the provincial capital city. Previous literature has documented the importance of the increased interbank competition stemming from the reform in terms of improvements of privately-owned firms' investments, access to finance, profitability, and export capability (Chong et al., 2013; Gao et al., 2019; Chen et al. 2020).

This reform represents, therefore, an ideal setting for our analysis. First, although changes to the economic, political, and social environment have significantly weakened gender discrimination in China, evidence suggest that women are still substantially discriminated in many situations, ranging from education (Rosenzweig and Zhang, 2009, 2013) to household expenditure patterns (Park and Rukumnuaykit, 2004).[3] Second, despite enhancements in competition and efficiency in the banking system, Chinese privately owned firms still encounter difficulties to obtain bank loans in a state-dominated banking sector that favours lending to state-owned enterprises (Chong et al., 2013; Allen et al., 2019), hindering their growth (Ayyagari et al, 2010). Third, the reform also allows us to examine its impact on informal finance, which can act as a substitute for bank credit for financially constrained firms (Degryse et al, 2016; Allen et al., 2019) or during period of banking turmoil (see, e.g., Choi and Kim 2005; Love et al. 2007). In fact, informal lending represents a substantial and growing source of financing for privately-owned firms in China (e.g., Allen et al., 2005; Ayyagari et al., 2010; Song et al., 2011; Degryse et al., 2016; Allen et al., 2019).[4]

Finally, Chinese commercial banks were less exposed to the Great Financial Crisis (henceforth GFC) of 2007-2008 compared to their Western counterparts, because of the conservative nature of their operations and the fact that mortgage borrowers were less likely to

[3] China has also had a strong preference for son (Lee and Wang 1999), and with one-child policy implemented since late 1970s there has been a deterioration of women status in families (Knight et al., 2010).

[4] Informal finance typically encompasses loans provided by delegated monitors (Rotating Savings and Credit Associations or ROSCAs, moneylenders and informal banks), trade credit, and family members and friends (Degryse et al, 2016; Lee and Persson, 2016; Allen et al., 2019). Informal finance tends to exhibit informational advantages compared to formal finance, rely less on collateral, have a greater contracting flexibility, and apply social sanctions and coercion (Kislat et al., 2013).

default bank loans have allowed (Luo, 2016). This attenuates concerns that the GFC is a confounding event in our analysis. This makes China an ideal setting to investigate how banking competition can affect gender debt bias.

Using granular survey of privately-owned SMEs in China that provides a variety of information on firm and entrepreneurs' characteristics,[5] our findings show that banking competition causes female entrepreneurs' debt usage to increase after the reform. Our estimations encompass industrial and provincial fixed effects, as well as firms' and entrepreneurs' characteristics. Our main findings are also robust to alternative model specifications.

We also explore for the effect of deregulation on the use of different types of external finance for female-led firms. Indeed, there could a substitution effect between different types of external finance related to the deregulation process. Previous studies argue that informal financing is considered as a second-best choice to formal financing as it is more expensive and less scalable (Degryse et al., 2016; Lee and Persson, 2016). Therefore, we conjecture that banking competition can alleviate distortions in the allocation of formal finance to female-led firms, reducing the use of informal financing. However, other studies (e.g., Allen et al., 2019) document that informal financing is also positively associated with the market proportion of credit allocation in China. This suggests that informal lenders could channel more resources to credit-constrained firms after the reform. Under this view, the reform can lead to the reduction

[5] The survey has been widely used in other studies (e.g., Lu and Tao, 2009; Chong et al., 2013; Zhou, 2013; Degryse et al., 2016; Haveman et al., 2017; Marquis and Qiao, 2020).

of the gender debt gap through the increase of both formal and informal finance and not only because of greater credit supply from banks. Our findings offer evidence that an increase of banking competition triggered by a shock to credit supply increases female entrepreneurs' usage of both formal and informal finance.

A concern in our analysis is that banking competition can exert an heterogenous effect on gender debt bias according to the degree of banking concentration in the local banking markets at the time of the reform. In fact, it could be that the reform is more beneficial to female-led firms in markets that are heavily concentrated pre-deregulation. To account for the heterogeneous effect of banking competition, we build an index of bank concentration using Herfindahl-Hirschman Index (HHI) based on provincial number of branches scaled by provincial amount of deposits. Then, we assign HHI dummy to equal to one if the index takes value greater or equal to the median value in 2008, and 0 otherwise. Finally, we rerun the baseline model conditional on the level of banking concentration at the provincial level. Our findings do not indicate any heterogeneous effect of provincial banking structure on access to debt for female entrepreneurs. This could be explained by the fact that structural indicators may not entirely capture local competitive dynamics as the number of branches increased similarly among provinces around the deregulation period. As highlighted by Gao et al. (2017), while the expansion from JEBs and CCBs have improved the credit allocation towards private firms, conversely the expansion from big five banks appeared to not have played a similar effect. Indeed, big five banks' new branches remain bias towards public and large firms also after the deregulation.

In China, gender inequality is especially prevalent in the provinces where gender stereotypes are rooted in local social norms (Wang et al., 2021). The existence of strong stereotypes against women may be a predetermined component of the gender debt bias, which could influence the effect of banking competition. Indeed, according to Ongena and Popov (2016), cultural gender bias determines a large proportion of the variation in credit access by female led firms. We posit that the effect of stereotypes towards women can reduce the effect of the enhanced banking competition. While deregulation could still be valuable, we expect that female entrepreneurs' debt usage may still be lower in provinces characterized by stronger stereotypes against women. Moreover, female-led firms may recur to more formal finance especially in the provinces with lower inherited gender bias, while they could resort to informal finance when experiencing higher financial constraints in the traditional lending market. Using data on stereotypes portraying women as less skilled and efficient at provincial level in 2008 from the China General Social Survey, we identify the provinces with the higher cultural bias against women.

Then, we re-estimate our basic specifications by further interacting with provincial gender cultural bias. We find that the effect of deregulation on gender debt gap weakens in provinces where gender cultural bias is particularly higher, although the coefficient is only significant at 10%. When focusing on the modes of external finance, however, we do not find evidence of a significant effect of cultural bias on access to debt for female entrepreneurs after the deregulation. Overall, this suggest that the level of provincial cultural bias do not alter the effect of deregulation on external finance' use for female entrepreneurs.

Another issue is related to the variation in firm size. While we study small firms, there is a considerable variation in their size, with female-led firms being usually among the smallest. The enhanced competition should be more relevant for small firms. In fact, small firms in China are more likely to incur on relatively severe financial constraints (Cull et al., 2015). Our findings show that firm size does not mitigate the effect of banking competition on gender debt gap.

We also rule out alternative explanations for our results. Specifically, we exclude that either female entrepreneurs' age or political connections can drive our results. We also run a battery of additional robustness tests. First, we saturate the model by including provincial multiplied industry fixed effects to control for possible time-variant provincial and industry characteristics that could affect both female entrepreneurs' participation choice and access to debt market. These tests confirm and support our findings. Then, we run a placebo test to corroborate the interpretation of the baseline results as evidence of deregulation on the gender debt gap. Finally, we employ a matching technique to construct suitable control/treatment samples for the comparison of debt usage between female and men-led firms after the deregulation.

This study contributes to the existing literature in several ways. First, this is the first study to examine the implications for gender-related aspects of access to credit due to an increase in banking competition. Previous studies mainly focus on whether banks are biased against female-led firms in their credit decisions (e.g., Muravyev et al., 2009; Alesina et al., 2013; Aristei and Gallo, 2016; Moro et al., 2017; De Andrés et al., 2020; Galli et al., 2020; De Andrés

et al., 2020; Delis et al., 2021). Others examine the impact of cultural belief on female entrepreneurs' credit access (e.g, Ongena and Popov, 2016).

Second, we contribute to the corporate finance literature on capital structure by showing how gender influences the firm's capital structure response to a banking competition shock. We add new insights to the literature examining the relationship between female entrepreneurs and financial decision-making. Previous studies find that firms run by women executives issue less debt than male executives (Huang and Kisgen, 2013; Faccio et al., 2016), choose a significantly shorter debt maturity structure compared to their male executive (Datta et al., 2021), and are generally more risk-averse (e.g., Sunden and Surette, 1998; Bernasek and Shwiff, 2001; Agnew et al., 2003; Huang and Kisgen, 2013).

Finally, this paper brings a new dimension to the literature on formal and informal finance in China. Previous studies have mainly focused on the implications of the use of either formal finance or informal finance for firms' growth (Ayyagari et al., 2010; Degryse et al., 2016, Allen et al., 2019). We document a spillover effect of the banking reform to the informal finance sector. We also add to this strand of the literature by showing that informal finance contributes to reducing the debt gender gap is certain situations.

The remainder of the paper proceeds as follows. Section 2 briefly discusses the banking deregulation in China; Section 3 presents data and methodology; Section 4 shows the main empirical results; Section 5 discusses additional analysis and robustness checks. Finally, Section 6 concludes.

2. Chinese banking deregulation

Since the economic reforms of 1978, the Chinese economy has been undergoing a steady growth with a sharp increase in privately-owned enterprises, which are currently regarded as the major drivers of the Chinese economic growth (Allen et al., 2005). Nonetheless, SMEs tend to experience severe credit constraints. The banking system is in fact dominated by five main state-owned banks,[6] which are biased towards extending lending to state-owned enterprises rather than to privately-owned enterprises (Chong et al., 2013). The lack of banking competition can hinder firms' access to finance as bank loans represent their primary source of finance. In fact, according to the China Statistical Yearbook 2017, about 71.19% of the Chinese enterprises was in fact financed by bank loans, while less than 3% by corporate bonds.

The banking system in China is mainly dominated by five State-owned banks, but it also comprises joint-equity shareholdings banks (JEBs) and city commercial banks (CCBs). JEBs are relatively large banks, although smaller than state-owned banks, and are specialized in large firms and SMEs. CCBs were created in the 1980s as urban credit cooperatives, which were non-bank financial institutions mainly oriented towards local SMEs (Chong et al., 2013). Starting from the mid-1990s, the Chinese government restructured urban credit cooperatives into city commercial banks to enhance and preserve financial stability. CCBs still mostly target SMEs. Before 2006, JEBs and CCBs were not allowed to freely expand their branches in other cities other than headquarter cities. Since 2006, the China Banking Regulatory Commission

[6] The big five banks encompass the Construction Bank of China, Agricultural Bank of China, Bank of China, Industrial and Commercial Bank of China, and the Bank of Communications. The latter one was also classified as a large state-owned bank in 2004, while the first four banks were established during 1978 –1984.

(CBRC) permitted JEBs and CCBs to open new branches in other cities. However, the 2006 policy imposed strict entry regulations to the opening of new branches, de-facto limiting the reform.[7]

This regulation remained in place until 2009, after which the legal barriers to bank branching was substantially removed. With the "Adjustment Comment on the Market Access policy of Setting up Branches for Small- and Medium-sized Commercial Banks" in 2009, both JEBs and CCBs could submit a single application to open multiples branches in a city, although conditional on the 2006 policy' geographic requirements. In addition, the cap to the number of branches was removed. Furthermore, there has been an effective reduction of the cost of new branch entry applications and simplification of approval's procedure by allowing the local CBRC office instead of CBRC central office to revise banks' applications. As a result, the timing for the reviewing process was largely reduced to 4 months (Gao et al., 2019).

This policy shock led to a significant growth of city commercial banks' branches and an increase competition pressure to incumbent commercial banks. As a result of this deregulation policy, there was a rapid increase in bank branches after 2009 as city commercial banks expanded outside their home cities (Hou et al. 2020). The total number of branches of city JEBs and CCBs has strongly increased from almost 6000 before the deregulation process to more

[7] Firstly, JEBs or CCBs could open branches in a city only on the condition of; i) having already a branch in that city; ii) or having established their provincial headquarters in the capital city of the province the city belongs to. Secondly, banks could only apply for a single branch and not for multiple branches at the same time. In addition, the total number of branches in one city was capped for any JEB or CCB. Thirdly, the review and approval process for each bank's application was requiring on average one year or longer.

than 15,000 in 2016 (see Figure 1).[8] Thus, the 2009 deregulation represents as an exogenous shock to bank competition and offers an ideal empirical setting to explore the effect of banking competition on access to finance for female entrepreneurs.

[Insert Figure 1 about here]

3. Data & Methodology

3.1. Data source

Our firm-level data come from the Survey of China's Private Enterprises, a bi-annual survey conducted jointly by the United Front Work Department of the Central Committee of the Communist Party of China, the All China Industry and Commerce Federation, and the China Society of Private Economy at the Chinese Academy of Social Sciences. This survey has been widely used in other studies (e.g., Chong et al., 2013; Degryse et al., 2016; Haveman et al., 2017; Lu and Tao, 2009; Marquis and Qiao, 2020; Zhou, 2013).

The survey employs a multi-stage stratified random sampling method and reports data for a balanced number of enterprises across all regions and industries in China. The dataset provides mainly information on entrepreneurs' characteristics (e.g., age, previous professional experience, gender), firms' characteristics (e.g., capital structure, performance, employees, asset type, firm policies, ownership structure). Our final sample encompasses 13,752 firms—10,194 owned by male entrepreneurs and 1,360 owned by female entrepreneurs over the period

[8] Data retrieved from China Banking Regulatory Commission.

2004-2016. Number of female-led firms remain relatively stable over the sample period as shown in Figure 2.

[Insert Figure 2 about here]

Data both on stereotypes portraying women as less skilled and efficient is retrieved from the China General Social Survey (CGSS). Finally, data on banks comes from official bank websites, annual financial reports, National Bureau of Statistics, government reports and a variety of other sources.

3.2 Empirical Strategy

To study the effect of shock to credit supply to gender debt bias, we employ a linear probability model where the dependent variable captures the debt usage from privately-owned firms. Specifically, we are interested in exploring whether changes to banking competition due to an exogenous shock to credit supply may affect the propensity of female entrepreneurs to use debt. In our empirical setting our key independent variables are *Female* and *Deregulation*. *Female* is a binary variable equal to one if the entrepreneur of firm j in sector s and province p is female, otherwise it is zero. *Deregulation* is equal to 1 for all the years after 2009 for all the firms.

For our investigation we consider a three-bi-annual surveys period: 2004, 2006 and 2008 surveys to analysis for the pre-deregulation period; and 2012, 2014 and 2016 for the post-deregulation period.[9] Finally, we interact the *Female* and *Deregulation* dummies to exploit the

[9] Survey for 2009/2010 does not include some key variables for our analysis. However, 2009/2010 coincides with the deregulation shock and would have not anyway considered for the analysis.

effect of deregulation for female entrepreneurs' debt usage. All firms and entrepreneurs' variables are retrieved from the survey.

Our empirical model is as follows:

$$\begin{aligned}\text{Finance}_{j,s,p,t} = \beta_0 + \beta_1 \text{Female}_{j,s,p} + \beta_2 \text{Deregulation}_t + \beta_3 \text{Female}_{j,s,p} \times \text{Deregulation}_t \\ + \beta_4 X_{j,p} + \gamma_s + \delta_p + \eta_t + \varepsilon_{j,s,p,t}\end{aligned} \quad (1)$$

where *Finance* encompasses a variety of variables to explore the female entrepreneurs' debt usage. First, we use a dummy, *Debt*, which is equal to 1 for those firms using debt otherwise it is zero. To identify whether a firm uses debt in general, we recur to questions in the survey that explicitly ask the entrepreneur to indicate the debt sources such as: *"By the end of year x, where did your loan for the business originate from? (also, in the format of loan balance); Did your business have any non-paid debt from other business?"*. By using dummies as dependent variables we can better detect changes in the propensity of female entrepreneurs towards the use of debt.

To explore the different modes of external finance, we distinguish between informal finance and formal finance. Following Allen et al. (2019) and Degryse et al (2016), we consider as formal debt all the loans provided by domestic commercial banks (state-owned banks, joint-stock banks, city commercial banks and credit cooperatives, and private banks) and foreign banks. Instead, we consider as informal debt all the loans provided by delegated monitors (Rotating Savings and Credit Associations or ROSCAs, moneylenders and informal banks), trade credit, and family members and friends. Informal finance mainly encompasses resources from individuals in the entrepreneurs' social circle, which is consistent with the existing literature (Degryse et al, 2016; Lee and Persson, 2016). We employ two dummies: i) *Formal*

debt which is equal to 1 for those firms using formal debt, otherwise it is equal to 0; ii) *Informal debt* which is equal 1 for those firms using informal debt, otherwise it is equal to 0.

A negative β_3 coefficient suggests that female gender bias is decreased for the effect on an increase of banking competition associated with the 2009 credit shock. Conversely, a positive or insignificant β_3 coefficient would indicate respectively an increase or no effect of banking competition on gender debt bias.

We employ a set of control variables as in previous studies (e.g., Brown et al., 2009; Ongena et al., 2013; Ongena and Popov, 2016; Allen et al., 2019). First, we account for entrepreneur-level characteristics: age (*Age*), personal income (*Personal income*) and several variables related to political connections. Specifically, we consider whether the entrepreneur is: i) a member of the All-China Federation of Industry and Commerce (*ACFIC*); ii) a member of the People's Congress or a member of the Chinese People's Political Consultative Conference (*CPPCC*) at the time of investigation, and 0 otherwise. We also consider whether the entrepreneur has previous ascribed political experience. Accordingly, we build a dummy variable, *Government Exp*, which is equal to 1 if the entrepreneur has any government experience, and 0 otherwise. Then, we consider firm-level variables as age (*Firm age*), sales increase (*Turnover increase*), logarithm of employees (*Firm Size*), ownership structure (*Ownership*), the presence of board of directors (*Bod*), overseas' investment (*Overseas invest*). Finally, we include provincial, industry fixed effect. Standard errors are clustered at the provincial level. The definitions of all variables are provided in Table A1 of the Appendix, while their pairwise correlations are in Table A2.

Table 1 presents the summary statistics for access to debt for the entire sample, female entrepreneurs, and male entrepreneurs. Female entrepreneurs represent 14.4% of our sample observations. As the table indicates, on average 43% of female-owned firms use debt against 59% of male-owned firms. Such difference is mainly driven by formal finance (38% vs. 53%). The gap between female entrepreneurs and male entrepreneurs narrows in the case of informal finance (15% vs. 19%), but it is still statistically significant.[10]

[Insert Table 1 about here]

4. Empirical Analysis

4.1. Main Results

In this section we present the main results. Column 1 of Table 2 reports the probability of debt usage of female led firms following the policy shift in 2009. First, we establish that female-led firms use less debt than their male-led counterparts, which is consistent with the notion that they experience higher barrier to access to finance. The coefficient estimates of *Female* are negative in all the specifications and significant at the 1% level, which suggests that female entrepreneurs use less debt, including both formal and informal debt, compared to male entrepreneurs. However, the coefficient of the iteration term *Deregulation*Female* has a positive effect on debt. This indicates that the deregulation, which increases banking competition, helps female-led firms to obtain more credit. These results are robust to

[10] Correlation coefficients between variables are reported in Table A2 in the Appendix.

controlling for provincial level and sector fixed effects as well as entrepreneurs and firms' characteristics.

[Insert Table 2 about here]

In Columns 2-3, we repeat this test with respectively formal debt and informal debt as the dependent variable and we observe a similar pattern around the deregulation year. The estimated coefficient on the iteration term between *Deregulation*Female* is in fact significantly and negatively related to formal debt and informal debt in Columns (2) and (3), respectively. Thus, female entrepreneurs are more likely to use both formal and informal debt after the 2009 shock. These results provide supporting the view that the effect of banking deregulation spills over also to the informal credit market, with positive implications for female-run firms.

Overall, our findings support the view that an increase of banking competition because of a shock to credit supply alleviates female entrepreneurs' difficulties to access debt market.

4.2.Bank Concentration

In this section, we explore whether banking concentration exerts an heterogenous effect on female entrepreneurs' debt usage according to the degree of provincial banking competition. In fact, the effect of the deregulation should be stronger in more concentrated local markets.

For this analysis, we calculate banking concentration using the HHI based on bank branch presence of financial institutions divided by the volume of deposits at the provincial level in 2008, the year before the deregulation. Then, we compute the median HHI and

construct a dummy variable, High HHI, which equals one for the provinces above the provincial median HHI value and zero for the other provinces (the ones below the region median HHI value).

Table 3 shows the results conditional on *Bank HHI Deposit*. In all the specification the coefficient of *Female*Deregulation* Bank HHI Deposit* is never significant. Instead, the coefficient for *Female*Deregulation* remains significant and like those of Table 3 in all specifications. The effect of deregulation on female-led firms' debt usage does not appear to depend on the level of banking concentration in the market pre-deregulation. This could be explained by the fact that structural indicators may not effectively measure the local banking competitive dynamics. Indeed, branches increases similarly between provinces so that structural differences among provinces did not significantly change around the deregulation period.[11] Then, banks do not appear to compete as they have a different business orientation. Top 5 banks' new branches serve state-owned and large firms while CCBs and JEBs' new branches approach a large variety of clients.

In provinces characterized by degree of banking concentration pre deregulation, the reform does not close the gender debt gap since it affects less the degree of competition compared to high HHI provinces.

Our findings suggest that similar arguments can be extended to female-led firms. Our results are also in line with prior studies arguing that more concentrated banking market prevent

[11] After ranking the HHI for each province in tencile in 2008 and 2009, the average standard deviation is 0.27

Chinese private firms from getting access to formal finance (Dollar and Wei, 2007; Song et al., 2011; Chong et al., 2013; Degryse et al., 2016).

[Insert Table 3 about here]

4.3. Variation in Stereotypes against Women

Another concern is that the presence of stereotypes against women may affect the relationship between banking competition and female entrepreneurs' debt usage. Indeed, the roles of women and men traditionally differ in China, and such differences emerge more forcefully in rural provinces (Banister, 2004; Rosenzweig and Zhang, 2009, 2013; Knight et al., 2010). Banking competition could be particularly valuable in the presence of stereotypes against women as it could alleviate the negative effect of such stereotypes by reducing inefficient behaviours in the lending market, and thus improving female entrepreneurs' access to debt market. Yet, taste-based discrimination could still reduce the effect of banking competition on gender debt bias: female-led businesses would either experience difficulties in accessing debt or be less likely to apply for a loan even in a more banking competitive environment.

We therefore consider whether the existence of stereotypes at the provincial level may affect the relationship between banking deregulation and women-led enterprises' debt usage. For this purpose, we use responses to a question from the China General Social Survey (CGSS) related to stereotypes portraying women as less skilled and efficient.[12] We compute the

[12] Specifically, respondents were asked to indicate the extent of their agreement—on a five-point scale ranging from "strongly agree" to "strongly disagree"—to the following statements: "Do you agree that men are more capable than women?".

provincial average for all the responses to such statement. Then, we build a dummy equal to 1 for the provinces with average responses in the top quartile, and zero otherwise, and we further interact the measure with *Female*Deregulation*.

Table 4 reports the findings. The coefficient estimates of *Female*Deregulation** *Discrimination* is negative and significant at 10 percent for *Total debt*, suggesting that high stereotypes against women may offset the positive effect of banking competition on gender debt bias.[13] In those provinces, female-led firms may even experience higher gender debt gap despite an increase of banking competition. On the contrary, such effect is not significant when focusing at the specific external modes of finance.

[Insert Table 4 about here]

Overall, this finding shows that high local cultural biases may shape how bank competition influences the gender debt gap.

5. Alternative Explanations

This section presents a battery of additional exercises that we carried out to rule out alternative stories. Firstly, it could be that political connections may alleviate female entrepreneurs' debt gap. The link between business and government covers indeed a pivotal role in China for firms' growth and viability, as the government decides in terms of resources allocation, issuance of licenses and permits, access to infrastructure (Li and Zhang, 2007; Shi et al., 2014). Political

[13] Deregulation has been particularly effective in provinces with low discrimination where the average number of branches is increased by almost 11% over the sample period. Conversely, provinces with high discrimination have seen a lower increase of the average branches over the sample period (nearly 7%).

connections can indeed help firms to address regulatory challenges (Agrawal and Knoeber, 2001), to overcome obstacles, such as access to finance (Faccio, 2006), but also to improve performance (Fan et al., 2007). Entrepreneurs, particularly in privately owned firms, may therefore recur to their political connections to get easier access to the debt market.).

For this analysis, we further estimate our model condition on owners' political position. Table 5 Panel A shows that the estimates for *Female*Deregulation*Political position* are never significant in any specification while the coefficient for *Female*Deregulation* remains significant and positive as in Table 2. This suggests that political connections do not affect how deregulation impact on female entrepreneurs' debt usage.

[Insert Table 5 about here]

As a further test, we consider the possibility that female entrepreneurs' age might explain the propensity towards debt. Indeed, young women may experience more difficulties in getting access to external finance as they appear to be more discriminated in the job market than elderly women or men (e.g. Guiso et al., 2008; Faccio et al., 2016).

For this analysis we interact entrepreneur' age, *Age,* with *Deregulation* and *Female*. Table 5 Panel B shows that the estimates for *Female*Deregulation*Age* is only negatively and significantly related at 10 percent in Column 1 when we consider Total Debt. Contrary to our expectations, it seems that older female entrepreneurs could be less inclined to use total debt. This could be explained by the possibilities that they did not use debt in the past and even after the deregulation they tend to be more sceptical towards external finance compared to younger entrepreneurs. No significant effect for *Female*Deregulation*Age* is found for formal and

informal finance, while the coefficient for *Female*Deregulation* remains significant and positive as in Table 2. Overall, our findings rule out these alternative explanations.[14]

6. Additional Analysis & Robustness Checks

This section presents a battery of additional analysis and exercises to assess the robustness of our findings. First, we consider the presence of foreign banks as an alternative indicator of domestic competitive dynamics in alternative to HHI. Then, we consider the fact that access to the debt market could depend on the fact that female entrepreneurs usually own smaller firms than their male counterparts.

Lastly, we run several tests to corroborate the validity of our empirical setting addressing concerns on the shock's exogeneity to the credit supply, potential omitted variables issues and sample selection.

6.1 Alternative Analysis

We first consider alternative measure to banking competition to assess whether deregulation may exert a heterogeneous effect on gender debt gap according to banking provincial characteristics. For this analysis, we focus on the foreign banks' penetration at the provincial level. Following China's entry into the World Trade Organization (WTO) in the late 1990s and with deregulation of the banking sector, China has gradually lifted its restrictions on foreign

[14] We highlight that both in the case of *Age* and *Political connections* we could not consider the values only in 2008 as the survey does not include panel data information on the firms.

banks (Lin and Zhang, 2009). This has favored the establishment of foreign banks' branches in China although their heir combined share of Chinese banking assets was only 1.3% in 2015, limiting their potential impact (Chen et al., 2020). For this analysis, we consider *Foreign banks %*. at the provincial level which is calculated as foreign banks' branches divided total number of branches at the provincial level in 2008. Table 6 exhibits the findings for this analysis. Our results do not show any significant coefficient for *Female*Deregulation*Foreign banks %*. Similarly, to Table 3 with HHI, this result confirms the pre-deregulation level of competition at the provincial level does not alleviate the effect of *Deregulation* on gender debt gap.

[Insert Table 6 about here]

Another issue is related to firm size. Specifically, we consider whether the effect of banking deregulation on the gender debt gap depends on the fact that female-led firms are usually small size. SMEs are typically more opaque than large firms as they do not usually have audited financial information and assets to be pledged as collaterals (Berger and Udell, 2002; Beck et al., 2006; Calabrese et al., 2020). As a result, they tend to be more credit rationed than their larger counterparts (Beck et al., 2006; Ferri and Murro, 2015). Similarly, small firms in China tend to experience severe financial constraints (Cull et al., 2015).

We therefore interact the variable *Firm size* with *Deregulation*Female.* Table 7 presents the results. Specifically, we observe no effect of *Female*Deregulation*Firm size* on *Total Debt*, *Formal Debt* and *Informal Debt*. This finding indicates that banking competition alleviate the gender debt gap regardless the firm size.

[Insert Table 7 about here]

6.2 Additional tests

In this section, we run a battery of robustness tests to corroborate our main findings. To ensure that our baseline results are driven by 2009 policy shock, we perform a placebo test by assigning to the variable *Deregulation* the value of one in the years following 2006 and zero for prior years. This test allows to exclude that the 2006 policy may have already exerted an impact on gender debt gap (See Section 2 for an extensive discussion on this point). Table 8 Panel A reports the findings. As expected, the estimates for *Deregulation*Female* are never significant.

Then, we saturate our model with provincial multiplied industrial FEs, whereas still controlling for many other firm and entrepreneurs' characteristics. In this way we account for possible time-variant provincial and industry characteristics that could affect both female entrepreneurs' participation choice and access to debt market. In Table 8, we rerun the analysis for Province multiplied Industry FEs for the baseline model (Panel B). Our findings still confirm that banking competition alleviate gender debt bias as female-owned firms use more debt after the 2009 policy shift.

Finally, we address potential selection bias, we employ a matching technique to construct suitable control/treatment samples for female and male led firms to explore the effect of *Deregulation* on debt usage. For this analysis we consider 1:1 matching with a caliper at 0.1%. The controls in defining the propensity score are the same as in the baseline model. Table 8

Panel C shows that the estimates for *Female*Deregulation* are still positive and significant for *Total Debt, Formal Debt, and Informal Debt* as in the case of the baseline model in Table 2.

[Insert Table 8 about here]

7. Conclusions

This paper explores the impact of an increase in banking competition on female entrepreneurs' debt usage for a sample of privately-owned Chinese SMEs. For this analysis, we focus on the deregulation of joint equity shareholding banks and city commercial banks' branching policy that took place in China in 2009 as a plausibly exogenous shock to the credit supply. Our findings show that female entrepreneurs recur to more debt if bank competition increases as well. We further investigate whether shock to credit supply can be stronger for certain modes of finance. Our findings offer new evidence that an increase of banking competition due to the shock to credit supply increases female entrepreneurs' usage of both formal and informal finance.

We document that local cultural biases may shape how bank competition influences the gender debt gap. In fact, female-led firms may recur to less debt in provinces with high gender discrimination even in the period post deregulation. We also exclude that our findings may be affected by female entrepreneurs' characteristics such as age or political connections. Our results are robust to the use of alternative model specifications, accounting for omitted variables, sample selection. Our findings offer tangible implications for female managers, financial institutions, and regulators. Further research may better shed light on whether female-

led firms use informal financing as a second-best choice when they cannot access banks loans, or because of specific firm conditions or behavioural mechanisms.

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Figure 1. Trend for City Commercial Banks (CCBs)
& Joint Equity Shareholding banks (JEBs) over the period 2004-2016

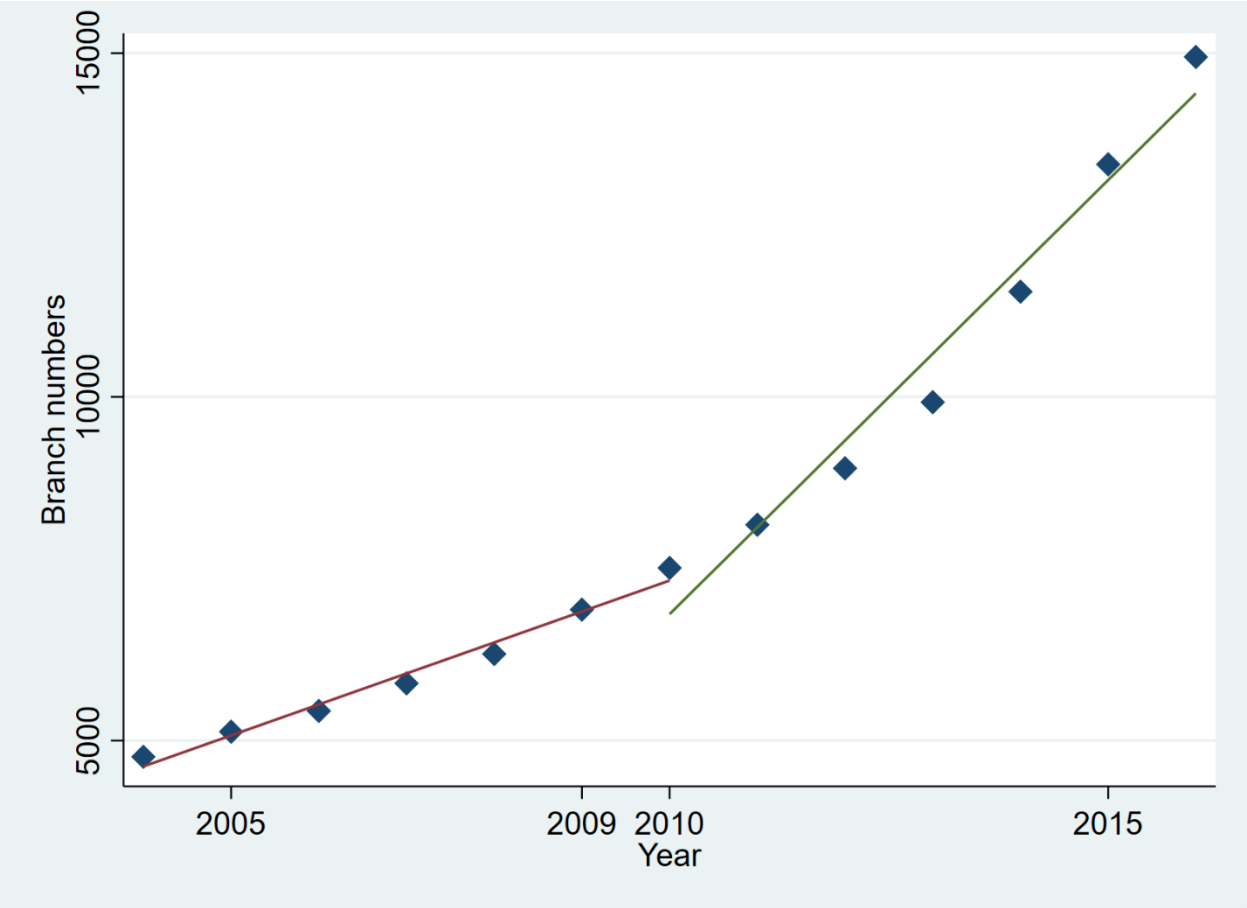

Figure 2. Female owners, formal/informal debt usage by female

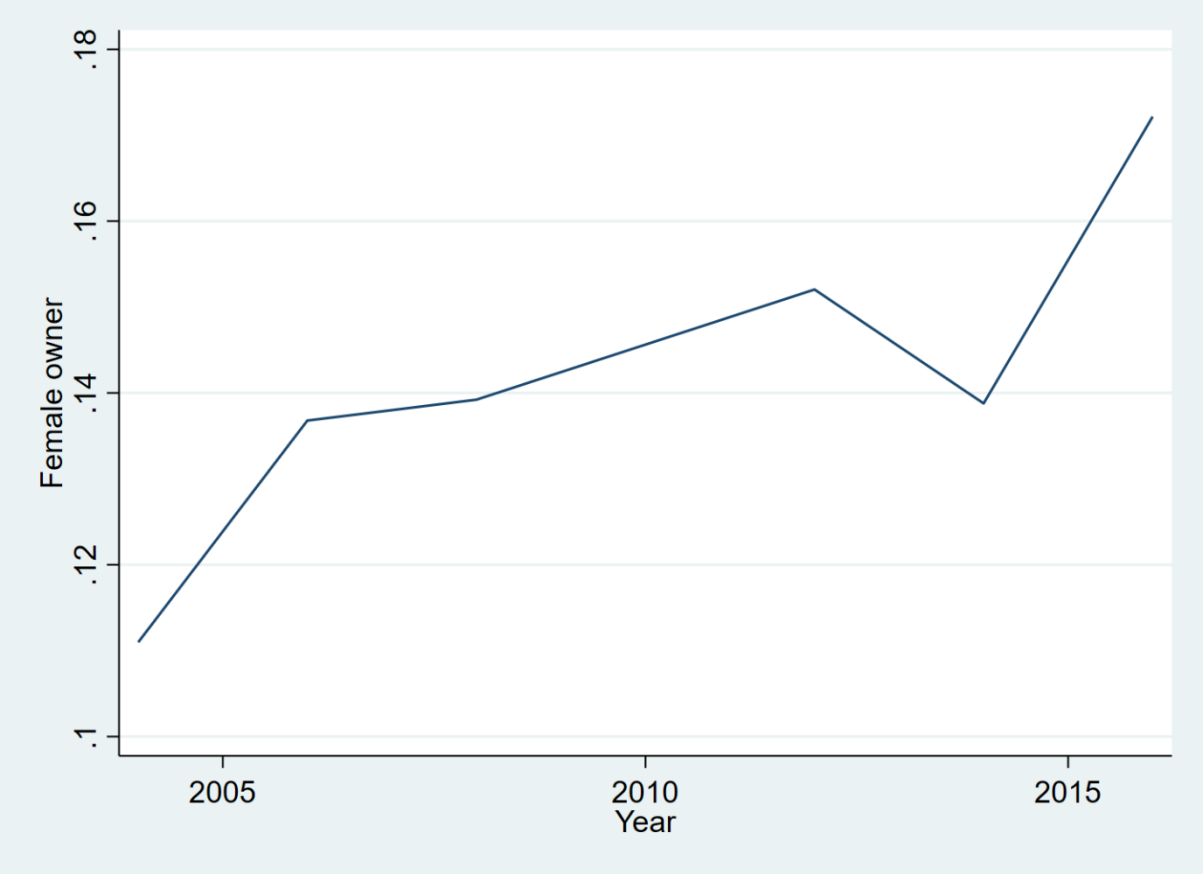
Female owner
.1
.12
.14
.16
.18
2005
2010
2015
Year

Table 1. Summary statistics

This Table presents the summary statistics of all variables including the cross-sectional average, standard deviation, median and observation number for total sample, the sample of firm led by female and male entrepreneurs, respectively. Variables are defined in Appendix Table A1.

Variable name	Total sample				Female				Male				F-M
	Mean	S.D.	Median	Obs.	Mean	S.D.	Median	Obs.	Mean	S.D.	Median	Obs.	Diff.
Female	0.144	0.351	0	15,175									
Age	46.791	8.613	47	15,175	44.797	8.723	44	2,187	47.127	8.549	47	12,988	-2.33***
Personal income (in 10000)	20.877	43.235	10	14,310	16.939	38.309	7.2	2,076	21.544	43.982	10	12,234	-4.605***
Firm age	10.016	5.576	9	15,175	9.160	5.495	8	2187	10.160	5.577	9	12,988	-1***
Firm size	199.274	814.596	50	15,018	100.255	374.809	25	2,158	215.890	865.702	56	12,860	-115.634***
Ownership	0.730	0.296	0.8	15,175	0.755	0.299	0.9	2187	0.726	0.295	0.8	12,988	0.029***
Turnover increase	0.548	0.498	1	15,175	0.484	0.499	0	2187	0.558	0.496	1	12,988	-0.074***
Bod	0.523	0.499	1	15,175	0.416	0.493	0	2187	0.541	0.498	1	12,988	-0.125***
Oversea invest	0.046	0.211	0	14,395	0.035	0.184	0	2101	0.048	0.215	0	12,294	-0.013***
Gov Exp	0.394	0.489	0	15,175	0.351	0.477	0	2187	0.402	0.490	0	12,988	-0.051***
ACFIC member	0.614	0.486	1	15,175	0.505	0.500	1	2187	0.632	0.482	1	12,988	-0.127***
Political position	0.541	0.498	1	15,175	0.430	0.495	0	2187	0.559	0.496	1	12,988	-0.129***

Table 2. The effect of banking deregulation on gender debt gap

This Table reports the probability of formal/informal debt usage of female led firms following the banking deregulation in 2009. Variables are defined in Appendix Table A1. Standard errors are clustered at province and year level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dep. Var.:	Total debt	Formal debt	Informal debt
	(1)	(2)	(3)
Female*Deregulation	0.0506**	0.0304*	0.0534***
	(0.018)	(0.017)	(0.014)
Female	-0.0462***	-0.0262**	-0.0437***
	(0.012)	(0.010)	(0.014)
Age	-0.0018	-0.0389	0.0088
	(0.034)	(0.034)	(0.033)
Personal income	0.0051	0.0138**	-0.0192***
	(0.006)	(0.006)	(0.007)
Firm age	0.0610**	0.0634***	0.0287*
	(0.028)	(0.019)	(0.016)
Ownership	-0.0207*	-0.0148	-0.0398***
	(0.011)	(0.015)	(0.012)
Turnover increase	0.0207**	0.0227***	-0.0055
	(0.008)	(0.007)	(0.010)
Bod	0.0189**	0.0222***	0.0087
	(0.007)	(0.006)	(0.011)
Oversea invest	0.1043***	0.1213***	0.1388***
	(0.032)	(0.019)	(0.031)
Firm size	0.1515***	0.2022***	0.0380***
	(0.007)	(0.018)	(0.009)
Gov Exp	0.0287**	0.0190*	0.0435**
	(0.011)	(0.011)	(0.016)
ACFIC member	0.0574***	0.0846***	0.0032
	(0.018)	(0.014)	(0.012)
Political position	0.0468***	0.0693***	-0.0048
	(0.007)	(0.008)	(0.011)
Sector FE	YES	YES	YES
Province FE	YES	YES	YES
Year FE	YES	YES	YES
Adj-R2	0.1946	0.2269	0.0974
Obs.	13452	13452	13452

Table 3. Interacting with HHI

This Table reports the probability of formal/informal debt usage of female led firms following the banking deregulation in 2009. Variables are defined in Appendix Table A1. Standard errors are clustered at province and year level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dep. Var.:	Total debt	Formal debt	Informal debt
	(1)	(2)	(3)
Female*Deregulation	0.0596***	0.0491***	0.0583***
	(0.017)	(0.016)	(0.020)
Female*Bank HHI Deposit	0.0061	0.0331	-0.0095
	(0.026)	(0.030)	(0.018)
Deregulation* Bank HHI Deposit	-0.2101***	-0.1195**	-0.1302***
	(0.030)	(0.042)	(0.033)
Female*Deregulation* Bank HHI Deposit	-0.0423	-0.0869	-0.0180
	(0.055)	(0.058)	(0.063)
Female	-0.0497***	-0.0360**	-0.0423**
	(0.015)	(0.016)	(0.017)
Controls	YES	YES	YES
Sector FE	YES	YES	YES
Province FE	YES	YES	YES
Year FE	YES	YES	YES
Adj-R2	0.1959	0.2263	0.0978
Obs.	13452	13452	13452

Table 4. Cultural gender biases

This Table reports the probability of formal/informal debt usage of female led firms following the banking deregulation in 2009. Variables are defined in Appendix Table A1. Standard errors are clustered at province and year level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dep. Var.:	Total debt	Formal debt	Informal debt
	(1)	(2)	(3)
Female*Deregulation	0.0839**	0.0660**	0.0634***
	(0.036)	(0.025)	(0.013)
Female*Discrimination	0.0211	0.0198	-0.0035
	(0.019)	(0.017)	(0.030)
Deregulation*Discrimination	0.0155	0.0270	-0.0018
	(0.020)	(0.027)	(0.032)
Female*Deregulation*Discrimination	-0.0893*	-0.0706	0.0201
	(0.049)	(0.057)	(0.048)
Female	-0.0646***	-0.0496***	-0.0626***
	(0.013)	(0.010)	(0.014)
Discrimination top	0.0217***	0.0149	0.0314
	(0.007)	(0.011)	(0.020)
Controls	YES	YES	YES
Sector FE	YES	YES	YES
Province FE	YES	YES	YES
Year FE	YES	YES	YES
Adj-R2	0.1636	0.1889	0.0726
Obs.	13452	13452	13452

Table 5. Ruling out alternative channels

This Table reports the probability of formal/informal debt usage of female led firms following the banking deregulation in 2009. Variables are defined in Appendix Table A1. Panel A reports the results when interacting with owner's age, while Panel B reports the results when interacting with political connections. Standard errors are clustered at province and year level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A	Total debt	Formal debt	Informal debt
	(1)	(2)	(3)
Female*Deregulation	0.6408**	0.5106*	0.0451
	(0.295)	(0.258)	(0.195)
Female*Age	-0.0388	-0.0755	-0.1313
	(0.084)	(0.075)	(0.103)
Deregulation* Age	0.2425	0.1348	0.1756
	(0.175)	(0.120)	(0.134)
Female*Deregulation* Age	-0.3445*	-0.2770	0.0130
	(0.173)	(0.160)	(0.114)
Female	0.0026	0.0794	0.1659
	(0.141)	(0.126)	(0.175)
Age	-0.0305	-0.0373	-0.0062
	(0.056)	(0.033)	(0.051)
Controls	YES	YES	YES
Sector FE	YES	YES	YES
Province FE	YES	YES	YES
Year FE	YES	YES	YES
Adj-R2	0.1734	0.1902	0.0967
Obs.	13452	13452	13452
Panel B			
Female*Deregulation	0.0708**	0.0547*	0.0506**
	(0.028)	(0.027)	(0.022)
Female*Political position	-0.0278	-0.0153	-0.0260
	(0.023)	(0.022)	(0.017)
Deregulation* Political position	0.0130	-0.0017	0.0110
	(0.020)	(0.017)	(0.015)
Female*Deregulation* Political position	-0.0388	-0.0381	0.0208
	(0.072)	(0.078)	(0.031)
Female	-0.0466***	-0.0365**	-0.0363**
	(0.013)	(0.016)	(0.016)
Political position	0.0847***	0.1200***	0.0051
	(0.009)	(0.009)	(0.013)
Controls	YES	YES	YES
Sector FE	YES	YES	YES
Province FE	YES	YES	YES
Year FE	YES	YES	YES
Adj-R2	0.1733	0.1902	0.0966
Obs.	13452	13452	13452

Table 6. Foreign banks

This Table reports the probability of formal/informal debt usage of female led firms following the banking deregulation in 2009. Variables are defined in Appendix Table A1. Standard errors are clustered at province and year level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dep. Var.:	Total debt	Formal debt	Informal debt
	(1)	(2)	(3)
Female*Deregulation	0.0694***	0.0427*	0.0608***
	(0.023)	(0.022)	(0.021)
Female*Foreign banks %	0.1625	0.8480	-0.1120
	(0.833)	(0.911)	(0.312)
Deregulation* Foreign banks %	0.0188	-0.0033	-0.3546
	(0.553)	(0.457)	(0.342)
Female*Deregulation*Foreign banks %	-0.6467	-0.7879	0.3738
	(1.207)	(1.383)	(0.431)
Female	-0.0493***	-0.0345**	-0.0541***
	(0.012)	(0.015)	(0.013)
Controls	YES	YES	YES
Sector FE	YES	YES	YES
Province FE	YES	YES	YES
Year FE	YES	YES	YES
Adj-R2	0.1945	0.2258	0.0760
Obs.	13452	13452	13452

Table 7. Firm Size

This Table reports the probability of formal/informal debt usage of female led firms following the banking deregulation in 2009. Variables are defined in Appendix Table A1. Standard errors are clustered at province and year level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dep. Var.:	Total debt	Formal debt	Informal debt
	(1)	(2)	(3)
Female*Deregulation	0.0810**	0.0559**	0.0631**
	(0.036)	(0.021)	(0.025)
Female*Employee top	0.0093	-0.0261	0.0037
	(0.029)	(0.021)	(0.037)
Deregulation* Employee top	0.0230	-0.0236	-0.0174
	(0.019)	(0.027)	(0.015)
Female*Deregulation* Employee top	-0.0529	-0.0320	-0.0179
	(0.062)	(0.036)	(0.046)
Female	-0.0595***	-0.0336**	-0.0489***
	(0.013)	(0.012)	(0.017)
Employee top	0.1053***	0.1779***	0.0192
	(0.005)	(0.016)	(0.014)
Controls	YES	YES	YES
Sector FE	YES	YES	YES
Province FE	YES	YES	YES
Year FE	YES	YES	YES
Adj-R2	0.1814	0.2083	0.0967
Obs.	13452	13452	13452

Table 8. Robustness Tests

This Table reports the probability of formal/informal debt usage of female led firms following the banking deregulation. Panel A reports the results from the placebo test when considering the banking deregulation in 2006. Panel B reports the results by including additional FEs, and Panel C reports the findings based on the matched sample. Variables are defined in Appendix Table A1. Standard errors are clustered at province and year level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Placebo test	Total debt	Formal debt	Informal debt
	(1)	(2)	(3)
Female*Deregulation	0.0533	0.0353	0.0364
	(0.033)	(0.030)	(0.028)
Female	-0.0455**	-0.0231*	-0.0478***
	(0.016)	(0.011)	(0.016)
Controls	YES	YES	YES
Sector FE	YES	YES	YES
Province FE	YES	YES	YES
Year FE	YES	YES	YES
Adj-R2	0.2113	0.2452	0.0760
Obs.	13452	13452	13452

Panel B: Additional FEs	Total debt	Formal debt	Informal debt	Debt ratio
	(1)	(2)	(3)	(4)
Female*Deregulation	0.0647**	0.0439*	0.0647***	-0.0309
	(0.024)	(0.025)	(0.017)	(0.057)
Female	-0.0623***	-0.0430***	-0.0535***	-0.0463
	(0.012)	(0.011)	(0.014)	(0.039)
Controls	YES	YES	YES	YES
Sector*Province FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
R2	0.2129	0.2286	0.1352	0.0838
Obs.	13452	13452	13452	13027

Panel C: Matching sample	Total debt	Formal debt	Informal debt
	(1)	(2)	(3)
Female*Deregulation	0.0404*	0.0452*	0.0343**
	(0.021)	(0.023)	(0.016)
Female	-0.0525***	-0.0358**	-0.0363*
	(0.013)	(0.015)	(0.019)
Controls	YES	YES	YES
Sector FE	YES	YES	YES
Province FE	YES	YES	YES
Year FE	YES	YES	YES
Adj-R2	0.1484	0.1137	0.0831
Obs.	3253	3253	3253

Appendix

Table A.1 Variable definitions

Variable name	Definition
Firm characteristics	
Firm age	It is the age of the business.
Firm size	It is the logarithm of the number of employees in the firm.
Turnover increase	Dummy variable that is equal to 1 if the firm increases its turnover comparing with the previous year, and 0 otherwise.
Ownership	Entrepreneur's equity as a percentage of total equity
Bod	Dummy variable that is equal to 1 if the firm has board of directors, and 0 otherwise.
Oversea invest	Dummy variable that is equal to 1 if the firm has overseas investments and 0 otherwise.
Province level characteristics	
HHI	It is the Herfindahl-Hirschman Index of the branch numbers for the city commercial banks located in certain province.
Discrimination	It is a scale measure to the response of the question "Do you agree that men are more capable than women?" in the survey of the Chinese General Social Surveys (CGSS).
Capital structure	
Debt ratio	It is the total bank debt scaled by turnover.
Debt dummy	Dummy variable that is equal to 1 if the firm has debt, and 0 otherwise.
Formal debt dummy	Dummy variable that is equal to 1 if the entrepreneur uses formal finance, i.e., loans from domestic commercial banks (state-owned banks, joint-stock banks, city commercial banks and credit cooperatives, and private banks) and foreign banks; and 0 otherwise.
Informal debt dummy	Dummy variable that is equal to 1 if the entrepreneur uses informal finance, i.e., loan received from delegated monitors (Rotating Savings and Credit Associations or ROSCAs, moneylenders and informal banks) and family members and friends; and 0 otherwise.
Personal demographics	
Age	The age of the responder.
Female	Dummy variable that is equal to 1 if the responder is female, and 0 otherwise.
Personal income	It is the total personal income of the responder (in 10 thousand).
Political position	Dummy variable that is equal to 1 if the responder is the member of the China Communist Party, and 0 otherwise.
Government exp	Dummy variable that is equal to 1 if the manager previously worked for government or state-owned enterprises before starting her own business, and 0 otherwise.
ACFIC member	Dummy variable that is equal to 1 if the responder is the member of the All-China Federation of Industry and Commerce (ACFIC), and 0 otherwise.

Table A2. Correlation Matrix

This table presents the correlation between each of the variables considered in this research. Variables are defined in Appendix A1.

	1	2	3	4	5	6	7	8	9	10	11	12
(1) Female	1.000											
(2) Firm size	-0.154	1.000										
(3) Firm age	-0.071	0.352	1.000									
(4) Ownership	0.035	-0.138	0.057	1.000								
(5) Turnover increase	-0.048	0.195	0.012	-0.078	1.000							
(6) Bod	-0.090	0.379	0.132	-0.207	0.107	1.000						
(7) Oversea invest	-0.023	0.088	-0.019	-0.008	0.018	0.049	1.000					
(8) Age	-0.096	0.201	0.342	-0.020	0.006	0.109	-0.003	1.000				
(9) personal income	-0.043	0.192	0.208	0.018	-0.029	0.056	-0.180	0.097	1.000			
(10) Government exp	-0.043	0.106	-0.095	-0.092	0.167	0.107	0.179	0.039	-0.340	1.000		
(11) ACFIC member	-0.092	0.465	0.347	0.005	0.115	0.242	0.025	0.187	0.137	0.087	1.000	
(12) Political position	-0.092	0.355	0.126	-0.043	0.159	0.200	0.164	0.105	-0.155	0.413	0.370	1.000