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WIDER Working Paper 2017/67

Discrimination, social capital, and financial constraints

The case of Viet Nam

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March 2017

United Nations University World Institute for Development Economics Research
wider.unu.edu

Abstract: This paper examines the relationship between gender, social capital, and access to finance of micro, small, and medium enterprises in the manufacturing sector in Viet Nam. Our dataset is from the 2011, 2013, and 2015 waves of the Micro, Small, and Medium Enterprise Survey in Viet Nam. Using the Heckman technique to control for sample selection bias, the data do not provide evidence for discrimination against female-owned enterprises in the formal lending market. Specifically, female entrepreneurs have a higher probability of getting a loan and they pay lower interest rates in comparison with male entrepreneurs. No discrimination in formal credit markets may arise from the preference for informal loans over formal loans—that is, entrepreneurs tend to borrow informal loans before applying for formal ones. Further analysis shows that social capital could facilitate loan applications: firms that have a closer relationship with government officials and other business people can get loans of longer duration.

Keywords: entrepreneurship, financial constraints, gender, discrimination
JEL classification: G21, J16, L26

Figures and tables: provided at the end of the paper.

Acknowledgements: We would like to thank the United Nations University World Institute for Development Economics Research (UNU-WIDER) for support.

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This study has been prepared within the UNU-WIDER project on 'Structural transformation and inclusive growth in Viet Nam'.

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ISSN 1798-7237 ISBN 978-92-9256-291-5

Typescript prepared by Lesley Ellen.

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The Institute is funded through income from an endowment fund with additional contributions to its work programme from Denmark, Finland, Sweden, and the United Kingdom.

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1 Introduction

Access to finance is considered as one of the main drivers of firms' growth. However, firms, especially small and medium enterprises (SMEs), often report a lack of access to finance. This, in turn, prevents firms from growing to their full potential and slows down economic development. Furthermore, if firms fail to gain loans from formal sources, they have to use their own funds or informal credit sources, which reduces their financial development due to credit limits, higher interest rates, or risks of borrowing from informal sources. Recently, a number of studies have examined the financial constraints faced by SMEs, especially emphasizing gender discrimination by financial institutions and the role of social capital in relaxing financial constraints.

Studies documenting the issues of gender discrimination and the role of social capital in access to finance face several challenges. First, the problem of sample selection bias has been widely recognized in the literature (e.g. Blanchard et al. 2008). This is the case when the dependent variables, like approval rates, interest rates charged, and loan maturity, are not observed for all firms in a random sample. In particular, entrepreneurs who can raise external finance from family and friends at interest-free rates may not apply for bank loans. Moreover, some entrepreneurs do not apply for bank loans because they anticipate rejection or unfavourable terms and conditions of credit. Although a number of studies have attempted to address this problem (e.g. Cavalluzzo et al. 2002; Cavalluzzo and Wolken 2005), the instruments employed are found not to be strong enough. In this study, we aim to fill this gap in econometric modelling by introducing different instruments in our sample selection corrections.

Second, recent literature suggests limited evidence for gender discrimination against female entrepreneurs. However, this might arise from the fact that most studies have been carried out in the US context where there are strong anti-discriminatory policies. Thus, investigating gender discrimination in the context of a transition country, where gender inequality remains a problem in society, might provide new evidence for the existing literature. Third, there is a lack of studies providing a comprehensive view about the role of social networks in emerging markets. In addition, limited studies consider whether social capital can mitigate the issue of gender discrimination in access to finance. This study aims to fill this gap in the literature by examining the impacts of the interaction between women's ownership of firms and social capital on access to finance of SMEs in Viet Nam.

Viet Nam represents an appropriate field of study for a number of reasons. First, despite the significant growth of SMEs in the economy, many SMEs in Viet Nam face difficulties in raising external financing, especially funds from formal sources. According to the World Bank's Enterprise Surveys for Viet Nam (World Bank 2015), access to finance is one of the top business obstacles for firms. Second, Viet Nam is, to some extent, a network-oriented economy, where social capital plays an important role in running businesses. Collectivism and the value of group membership are more important than individualism in Vietnamese culture (Swierczek 1994). This therefore makes Viet Nam an interesting case for investigating the impact of social networks on obtaining finance. Third, although the gender gap in Viet Nam has been narrowed, gender inequality still remains in society generally and in the economy in particular (World Bank 2016).

Our sample is based on the 2011, 2013, and 2015 waves of the Micro, Small and Medium Enterprise Survey in Viet Nam. The final dataset contains 4,961 observations of 2,661 SMEs in the manufacturing sector. Using Heckman regressions to control for sample selection bias, our key findings do not provide evidence of gender discrimination in the lending market. More specifically, female-owned firms are more likely to get loans and pay lower interest rates compared

to male-owned firms. Although better social capital may not guarantee a bank loan for firms, it might still help firms to get better deals such as longer loan maturity. Our results are robust when we employ different social capital measures. These findings may be explained by discouragement from borrowing formal loans. That is, firms, especially male-owned firms, are more likely to borrow from informal sources like families and friends before applying for formal loans. The preference for informal loans might arise from the fact that although it is easy to get loans from private lenders, loans from families and friends are often interest-rate free.

This study provides an in-depth understanding of obstacles in the financing of SMEs in Viet Nam, which may help firms get better access to finance in the future and guide policy implications. First, firms could invest in their social capital, particularly their relationship with government officials and bankers as well as business networks, to facilitate their loan applications. Second, credit programmes targeting SMEs with low interest rates and longer loan maturity terms might be expanded. This is because the current lending programmes for SMEs are limited to specific sectors and conditions that discourage SMEs from borrowing from the formal sector.

Our paper provides new evidence for the issue of financial constraints regarding the effect of women's ownership of firms and the role of social capital in a developing country context. More specifically, we do not observe the presence of discrimination against women entrepreneurs by Vietnamese financial institutions. Our results are in line with previous studies by Cavalluzzo and Cavalluzzo (1998), Blanchflower et al. (2003), and Madill et al. (2006). This study also sheds light on the relationship between social capital and access to finance: better social capital may partially help firms in relaxing their financial constraints, i.e. firms with better social networks are more likely to have access to longer loan terms. This result is different to suggestions in the existing literature by Ahlstrom and Bruton (2006), Le et al. (2006), and Talavera et al. (2012).

The remainder of the paper is organized as follows. The next section reviews the related literature about discrimination, social capital, and access to finance. Section 3 provides an overview of institutional frameworks of SMEs in Viet Nam. Section 4 presents the descriptive statistics and the identification strategy. Section 5 provides the main empirical results and robustness check. Section 6 concludes and provides the policy implications.

2 Literature review

2.1 Discrimination and access to finance

The economics of discrimination have been well developed in the past few decades and can be divided into two main models: a taste-based model and a statistical model. These models can be distinguished through the causes, nature, and economic effects. The taste-based preference model, or Becker-type model of discrimination, was first introduced by Becker (1957). This suggests that discrimination arises from a personal prejudice, or taste, against certain individuals or groups. Thus, individuals who have a taste for discrimination are willing to pay a price to indulge those tastes. In the lending market context, this can be implied by higher interest rates charged to the disadvantaged group, i.e. lenders require an interest rate premium to compensate for having to associate with the disadvantaged group. Discrimination in the lending market can be also be demonstrated through fewer loans being held by disadvantaged borrowers.

From the statistical perspective, however, discrimination can be the result of imperfect information. Lack of information leads to stereotypes that group-level characteristics can be proxies for characteristics of individuals belonging to that group (Arrow 1973; Phelps 1972).

Hence, individuals can be treated differently depending on what groups they belong to. With regard to the lending market, statistical discrimination may be induced when lenders are imperfectly informed about some borrower characteristics that are relevant to decision making. Further, acquiring information is very costly. Thus, lenders tend to use characteristics of the applicants' groups when making loan decisions.

Discrimination in the credit market is empirically tracked by the differences in loan approval rates or interest rates charged across groups. These differences may be explained by personal characteristics that are irrelevant to transactions (e.g. gender, race, or ethnicity). One of the main threads in the literature examines racial discrimination in lending markets and finds strong evidence for this (e.g. Bates 1997; Blanchard et al. 2008; Blanchflower et al. 2003; Cavalluzzo and Cavalluzzo 1998; Fraser 2009). Another thread in the literature relating to discrimination in lending is gender discrimination, which embraces both types of discrimination. Most of the studies investigate the presence of gender discrimination in the credit markets in the context of developed countries and provide an ambiguous picture. For instance, Cavalluzzo and Cavalluzzo (1998) find that when the US credit market is more concentrated, female-owned businesses have more benefits in relation to loan applications in comparison with their male owned-business counterparts. Similarly, Cavalluzzo et al. (2002) acknowledge that there is a credit gap between male-owned and female-owned firms and greater concentration increases the fears of denial faced by female-owned businesses in the US context. Although there is no difference between female-owned and male-owned businesses in terms of loan approval rates, men-owned firms are more likely to get larger loans and pay lower interest rates compared to women-owned firms (e.g. Alesina et al. 2013; Coleman 2000; Treichel and Scott 2006). However, other studies do not observe discrimination against women in lending markets (Blanchflower et al. 2003; Bostic and Lampani, 1999; Madill et al. 2006). In addition, Asiedu et al. (2012) find that white women-owned firms do not face discrimination in access to finance and pay lower interest rates than white men-owned peers at the same time.

Limited studies about gender discrimination in the context of developing countries also provide mixed results. For example, there is no evidence for gender discrimination in access to finance in Trinidad and Tobago (Storey 2004). Documenting women's disadvantages in access to finance in Sub-Saharan Africa, Aterido et al. (2013) suggest that the gender gap in lending markets can be explained by firms' characteristics and selection bias rather than by pure gender discrimination. More specifically, women-owned firms tend to be smaller, resulting in lower probability of getting loans. Further analysis shows that female entrepreneurs face higher barriers in loan applications in the first place compared to male peers. Focusing on credit access differentials between men- and women-owned manufacturing enterprises, Hansen and Rand (2014a) find evidence for gender discrimination against women for medium-sized firms in Sub-Saharan Africa while the opposite results are found for small enterprises. Furthermore, female-owned firms in Sub-Saharan Africa are more likely to face financial constraints compared to male-owned firms (Asiedu et al. 2013). Employing a cross-country sample, Muravyey et al. (2009) also find the existence of gender discrimination in the credit markets: firms owned by female entrepreneurs experience higher denial rates and pay higher interest rates. However, the discrimination differs across countries: female-owned firms in more financially developed countries are more likely to get loans and receive lower collateral requirements compared to those in less developed countries. A recent study by Hansen and Rand (2014b) reveals that these inconclusive results may be explained by the differences in the measures of credit constraint.

2.2 Social capital and access to finance

Issues relating to the role of social capital in emerging countries have been documented with reference to three different types of networks: official networks (networks with government

officials and bankers), managerial networks (networks with customers and suppliers), and social networks (networks with social organizations or associations and networks with relatives and friends). These types of networks can affect firms' access to finance in different ways.

Several studies have found that better social capital can facilitate firms' loan applications. For example, Ahlstrom and Bruton (2006) find that the relationship with government officials is positively related to venture capital financing in East-Asian transition countries. This can be explained by the considerable power and influence of government officials in project approval and resource allocation (Meyer and Nguyen 2005). Furthermore, it has been documented that asymmetric information is one major problem in the undeveloped financial markets (Nguyen et al. 2006). To learn more about loan applicants, bankers might seek extra information from the relevant government officials or applicants' other networks. As a result, firms with stronger social ties are more likely to get loans or get better loan terms (Le and Nguyen 2009; O'Connor 2000; Tenev et al. 2003). Examining a sample of 282 Argentinean entrepreneurs, Fornoni et al. (2012) acknowledge that social capital can facilitate firms' access to finance. The positive impact of the relationship with key customers on venture capital financing is also found in Ahlstrom and Bruton (2006). Moreover, membership of a business association or political party is one way of spreading knowledge about a firm's existence, as well as being an indicator of reputation (Coleman 1988). This, in turn, may also help firms gain access to finance. Talavera et al. (2012) show that in China, Communist Party membership has a positive impact on state-owned bank loan applications. More specifically, firms whose owners are members of the Communist Party have a higher probability of getting loans from state-owned banks. Furthermore, they find that business associations can assist private enterprises with commercial bank loan applications by recommending good enterprises to banks.

Nevertheless, some other studies suggest that firms with better social networks are less likely to rely on external credit. Documenting this issue regarding different firms' growth stages, Le et al. (2006) acknowledge that ties with government officials have a negative impact on firms' access to credit in Viet Nam. They explain this result by the fact that close ties with government officials may help firms to get financial support from the government and therefore they may no longer need bank loans. Similarly, it may be the case that a close relationship between firms, suppliers, and customers could promote trade credit that in turn distorts the need for external funding. For instance, in their study of informal credit in Viet Nam, McMillan and Woodruff (1999) find that trade credit is quite common in their sample with 57 per cent of ongoing customer relationships and 53 per cent of ongoing supplier relationships having some sort of trade credit. Another argument is that firms might rely on informal loans instead of formal ones since informal loans from family and friends are more convenient, with lower interest rates, longer duration, and no collateral or guarantee requirements. Hussain et al. (2006) find that SMEs in China rely exclusively on financial support from their immediate family at the start-up stage and also during the development of firms. The reliance of SMEs on informal loans is also documented in Viet Nam: Nguyen et al. (2006) find that informal loans are the principal sources of external finance of many private SMEs. As a result, social networks lead to a reduction in the need and use of formal credit (Le and Nguyen 2009).

3 Vietnamese SMEs' institutional framework

Since the *Doi moi* (Reform) policy came into effect in 1986, Viet Nam has achieved remarkable results in socio-economic development. Liberalization of the economy and adoption of the market economy have resulted in a significant increase in private enterprises. The introduction of micro, small, and medium enterprises in Viet Nam has followed the approval of the Law on Enterprises in 2000.[1] Since then, SMEs in Viet Nam have grown dramatically. According to the White Book on SMEs in 2009, from 2000 to 2008, the average registered capital of small and medium enterprises increased by nine times. The increases were VND0.962 billion, VND3.14 billion, VND8.1 billion, and VND8.7 billion in 2000, 2006, 2007, and 2008, respectively.

As Viet Nam has been undergoing an economic transition process toward a market economy with a socialist orientation, obstacles to the development of the private sector remain. Many SMEs report that financial constraint is one of the major obstacles for firms (World Bank 2016) and they, therefore, need to seek external capital such as formal loans, government financial support, or informal credit from different sources. Since the Vietnamese banking sector is heavily regulated, government officials at all levels still have considerable influence on banking operations. Moreover, since the late 1990s, the Vietnamese government has provided financial support programmes—so-called 'policy loans'—which have been channelled through the state-run Social Policy Bank and Viet Nam Development Bank. Thus, SMEs can make use of their close ties with government officials to facilitate commercial loan applications and get access to these support programmes. Other credit sources widely used in Viet Nam are: (1) informal loans from family, friends, and private lenders; (2) informal loans from private lenders; and (3) trade credit from suppliers and customers. Each of these informal credit sources has its own pros and cons. For example, loans from family and friends are inexpensive but limited, while loans from private lenders are very costly with high interest rates. Moreover, given that finding customers is the most critical challenge for Vietnamese SMEs (Nguyen et al. 2002) and the use of trade credit depends on firms' creditworthiness, only firms which already have a good credit history and long-term relationship with suppliers and customers can use trade credit.

In the area of social development, Viet Nam has made some achievements in narrowing the gender gap (Wells 2005). Following the implementation of the Law on Gender Equality and the National Strategy on Gender Equality, gender disparities in primary and secondary education have been reduced while women's participation in politics and in the economy has been promoted and increased. However, since Confucianism has been a main philosophy in Vietnamese society for centuries, its underlying belief of gender difference remains. Therefore, gender inequality has not been removed completely, especially in the less developed/rural parts of Viet Nam. For example, according to the 2009 Labour Force Survey, women's wages are about 75 per cent of men's wages. Women are also exposed to more vulnerable jobs such as own-account work[2] and unpaid family labour (World Bank 2011). Moreover, women in Viet Nam are not encouraged to start their own businesses since there is still resistance to women taking up leadership positions. According to the 2006 National Survey conducted by the Internal Finance Corporation, women entrepreneurs do face difficulties in seeking external capital. These include: (1) a complicated lending process; (2) high interest rates; and (3) lack of collateral. Although gender discrimination is not reported as a

[1] Based on the classification in Government Decree 56/2009/ND-CP, there are two criteria for defining the type of SME i.e. scale of total assets and annual average number of employees. Accordingly, micro, small, and medium enterprises in Viet Nam are firms with less than 10, 10–200, and more than 200–300 employees, respectively.

[2] Own-account workers are entrepreneurs without any employees.

major difficulty, 3 per cent of respondents report that they have perceived some sort of discrimination.

Data from three waves of the Enterprise Surveys conducted by the World Bank in 2005, 2009, and 2015 have provided an overview of access to finance of SMEs in Viet Nam. In general, about 60 per cent of small and medium enterprises reported that access to finance is an obstacle for their operation and growth. In terms of level of impact, most firms judged this to be a moderate or major obstacle. Furthermore, of those firms that reported they required a loan, the number of discouraged borrowers made up about 50 per cent. The major reason given for not applying for a loan was that the application procedures are too complex. Other reasons include: (1) collateral requirements are too high; (2) interest rates are unfavourable; (3) the size of loan and maturity are insufficient; and (4) an expectation that their application would be rejected.

4 Empirical strategy

4.1 Data and sample

This study is based on the data from the 2011, 2013, and 2015 waves of the Micro, Small, and Medium Enterprise Survey in Viet Nam. The surveys are conducted by the United Nations University World Institute for Development Economics Research (UNU-WIDER) in collaboration with two Vietnamese partners (UNU-WIDER 2016). The 2015 survey provides detailed information about 2,649 formal and informal micro SMEs in the private manufacturing sector in nine provinces of Viet Nam.

The surveys consist of three modules: (1) a main enterprise questionnaire whose respondents are either the owners or managers; (2) an employee questionnaire; and (3) an economic accounts questionnaire (UNU-WIDER 2016). In this study, we focus on (1) the enterprise questionnaire that provides detailed information on firm performance, enterprise history, employment, business environment, and owner background characteristics, and (2) the economic accounts questionnaire which contains information on firms' revenues, costs, assets, and liabilities.

The original sample includes 2,512 firms in 2011, 2,542 firms in 2013, and 2,650 firms in 2015. The data-screening process is as follows. First, for the purpose of this study, we only include firms whose legal status is that of household, private/sole proprietorship, partnership, limited liability company or joint stock company without state control. Second, for the purpose of our identification strategy, we only keep firms whose owners are survey respondents. Third, preliminary analysis shows that some formal loans have either zero interest rates or zero loan maturity. Thus, we replace interest rate information and loan duration with missing values for those observations. Finally, we drop the observations that have suspicious returns on assets (ROA > 100 per cent) which could mislead the results if included. After screening, our final sample includes 4,961 observations in which, the total number of firms is 1,722, 1,652, and 1,587 in 2011, 2013, and 2015 respectively.[3]

We follow the loan application process specified in Cole and Sokolyk (2016). Firms reporting no need for a loan are classified as non-borrowers. The complementary group (potential borrowers) consists of firms that do not apply because of lending conditions, approval, or process

[3] According to the classification in Government Decree 56/2009/ND-CP, most firms participating in the surveys are micro firms.

(discouraged) and firms that apply for loans (loan applicants). The latter group then consists of unsuccessful borrowers, whose applications are rejected, and successful borrowers. Panel A of Figure 1 summarizes data on loan applications across different groups. We observe the presence of non-borrowers among both males and females in our sample. More specifically, 39.12 per cent of male entrepreneurs do not apply for formal loans, while this number is 39.60 per cent for females. However, the share of discouraged borrowers among male-owned firms is considerable higher than the share of discouraged borrowers among female-owned firms, 34.70 per cent versus 32.37 per cent, respectively. In terms of loan approval, the approval rate for male-owned businesses is significantly lower than the approval rate for female entrepreneurs with 24.18 per cent versus 26.64 per cent, respectively. This suggests that male-owned firms in Viet Nam face more obstacles in accessing finance compared to female-owned firms. Data from the surveys allow us to identify reasons why firms in need of external finance do not apply for formal loans. The top three reasons include: (1) firms do not want to incur debt; (2) interest rates are too high; and (3) the process is too difficult.

Table 1 displays detailed descriptive statistics for all firms. Even though the number of female-owned firms is lower than that of male-owned enterprises, this still accounts for roughly 28 per cent of the total number of SMEs. The average age of owners is about 50 years old and most are from the ethnic majority. While most owners have completed high school education, only a few have college or higher education degrees. Regarding firms' characteristics, most of firms are located in less-developed provinces rather than in large developed cities. Interestingly, we observe that informal loans have longer loan maturity terms and lower interest rates compared to formal loans. This suggests that most informal loans in the sample are provided by family and friends. In addition, from 2011 to 2015, the formal interest rates charged to SMEs in Viet Nam have dropped steadily while loan maturity terms have been extended (Panel B, Figure 1).

Table 2 shows the descriptive statistics by gender. Males tend to face more financial constraints compared to females. Subsequently, male-owned firms are more likely to apply for formal loans but are less likely to obtain one compared to their female counterparts. Furthermore, we do not observe any significant differences in terms of informal loan terms between female-owned and male-owned firms while male-owned firms tend to pay higher formal interest rates. In terms of social capital, women appear to have better business networks while men are more likely to have close relationships with government or bank officials. We also observe that the number of informal loan applications is higher compared to the number of formal loan applications (Figure 2). The distributions of informal interest rates and formal interest rates charged to SMEs are shown in Figure 3, while the sources of informal loans are presented in Figure 4. As can be seen, firms can borrow interest-free loans from family and friends; together with the reasons for being discouraged to borrow through formal loans, this possibly explains the domination of informal loans in the sample.

With regard to owners' characteristics, the differences in ethnicity as well as education level and work experience are quite strong. Most male owners are of the ethnic majority and have higher levels of education compared to women. Further, most of them have worked as waged employees while women's previous work is mainly self-employed. While many male owners are members of the Communist Party or war veterans, this number is small among females. With regard to firms' characteristics, although men-owned firms are bigger in size, on average those firms perform worse than women-owned firms, with lower average returns on assets.

4.2 Methodology

Loan applications

Previous studies about financial constraints mainly focus on the probability of obtaining loans and differences in loan terms (e.g. Blanchard et al. 2008; Cavalluzzo et al. 2002). Unlike those studies, we first aim to investigate the disparities in loan applications made by women and men. This analysis is conditional on the need for loans. As our identification strategy, we employ the probit response model with sample selection (Van de Ven and Van Praag 1981). Loan application, a binary variable, is our dependent variable. Our model is as follows:

$$Apply_{it} = \alpha + \beta Female_{it} + \gamma Social\ capital_{it} + \theta Female \times Social\ capital_{it} + X_{it}\delta + \varepsilon_{it} \quad (1.1)$$

$$Probit(Need_{it} = 1) = \phi\big(\tilde{\alpha} + \tilde{\beta} Female + \tilde{\gamma} Social\ capital_{it} + \tilde{\theta} Female \times Social\ capital_{it} + X_{it}\tilde{\delta} + \tilde{\psi}_1 Share\ of\ jobs_{it} + \tilde{\psi}_2 Innovation_{it}\big) \quad (1.2)$$

where *i* indices firm and *t* indices year; (1.1) is the main equation while (1.2) is the sample selection equation.

In equation (1.1), $Apply_{it}$ takes the value of 1 if firms apply for a formal loan, 0 otherwise. The key variable of our analysis, *Female,* is the binary variable indicating whether an owner is female. *Social capital* is the dummy variable that equals 1 if an entrepreneur has one of the social networks. Social networks in this study are indicated by relationship with government/bank officials and relationship with business people.[4] The interaction terms between female and social network proxies are also included.

Vector X captures firms' creditworthiness, and other owners' characteristics that may affect creditors' decisions. Other characteristics of the owners are captured by: *Age* (natural logarithm of the owner's age); *Ethnicity* (1 if the owner is ethnic majority, 0 otherwise); *Education* (first component of principal component analysis of basic education and professional education); *Veteran/Communist* (1 if the firm owner is a war veteran or is a member of the Communist Party, 0 otherwise); and work experience (*Previous job status* equals 1 if the owner's previous job is waged employee, 0 otherwise). From the behavioural perspective, younger owners have greater incentives to take on riskier projects and are therefore less favourable when trying to access loans. In addition, owners with higher education levels and more relevant work experience are expected to perform better management. Furthermore, being a member of the Communist Party or war veteran, or being of the ethnic majority may help firms have better access to bank loans.

Firms' characteristics are indicated by *Size* (natural logarithm of firm's assets), *Firm age* (natural logarithm of the firm's age), *Export* (1 if the firm has direct export activity, 0 otherwise) and *Accounting* (1 if the firm follows the accounting standard in accordance with government guidelines, 0 otherwise). It is widely accepted that a bigger and older firm may have a better credit history as well as a better reputation and longer-term relationship with creditors. Moreover, firms that export and maintain a formal accounting book in accordance with government guidelines are likely to be trustworthy and have higher chances of getting loans. Return on assets (*ROA*) proxies for firms' profitability, a key factor in firms' potential to repay from the point of view of banks. Credit history

[4] Although business association membership could be important social capital, we only observe a low proportion of firms that take part in business associations. For this reason, we do not analyse this aspect of the data.

(*Bad credit history* equals 1 if the firm fails to service its debt, 0 otherwise) is another main factor that banks use to screen applicants' profiles and therefore it is also included in our regressions.[5]

In equation (1.2), we consider selection into firms reporting that a loan is needed. Hence, the main equation identifies the differences between those who actually are in need of a loan and those who do not need extra finance. There is an assumption of joint normality of error terms and non-zero correlation ρ between (1) and (2). If $\rho \neq 0$, the standard model without selection will be biased and provides inconsistent estimates.

Identification of the selection equation requires instruments that affect the need for a formal loan but do not affect the decision to apply. In this study, we employ two instruments. It has been shown that firms tend to use internal finance before seeking external finance (Myers 2000). Moreover, the owner's private wealth is found be to one of the main internal finance sources for SMEs (e.g. Vos et al. 2007; Ughetto 2008). Hence, the first instrument employed is jobs as share of working-age adults[6] in the owner's household (*Share of jobs*).[7] More jobs generating more income can be used as internal finance for firms, thus reducing the need for external finance. The second instrument is innovation activities of the firms (*Innovation*). It has been argued that firms, especially small firms, often face financial constraints when they conduct research and development and innovation projects (e.g. Hyytinen and Toivanen 2005; Beck and Demirguc-Kunt 2006). In other words, if the firms adopt new technology or introduce new products, they will need extra funding to finance these activities. These instruments are valid since the final decision as to whether firms apply for a formal loan depends on other factors. For example, firms might get funding from informal sources before applying to formal sources.

Loan approval

The second part of our analysis focuses on the possible differences in loan approval rates for female- and male-owned firms. The dependent variable, $Loan_{it}$, equals 1 if firms get a formal loan, 0 otherwise. Since this analysis is conditional on actual loan applications, sample selection bias may arise because some firms may have chosen not to apply for a formal loan in anticipation of being rejected or being offered unfavourable loan conditions due to discrimination. As covered in the descriptive statistics, we observe these discouraged borrowers (firms needing loans but which do not apply) in our sample. To address this problem, we employ the following model:

$$Loan_{it} = \alpha + \beta Female_{it} + \gamma Social\ capital_{it} + \theta Female \times Social\ capital_{it} + X_{it}\delta + \varepsilon_{it} \quad (2.1)$$

$$Probit(Apply_{it} = 1) = \phi\big(\tilde{\alpha} + \tilde{\beta} Female + \tilde{\gamma} Social\ capital_{it} + \tilde{\theta} Female \times Social\ capital_{it} + X_{it}\tilde{\delta} + \tilde{\psi}\ Applied\ for\ informal\ loans_{it}\big) \quad (2.2)$$

where the independent variables in equation (2.1) are defined in exactly the same way as the ones in equation (1.1).

[5] Details of the variables and their definition can be found in Table A1 the Appendix.

[6] The working-age range is from 15 to 60.

[7] We also decompose jobs in the household into jobs in firms, waged jobs elsewhere, and self-employed. Our results are relatively robust.

In the selection equation (2.2), $Apply_{it}$ equals 1 if a firm applies for a formal loan and 0 otherwise. This equation is estimated for the sample of firms that apply for a bank loan. Again, we need to find instruments that affect the likelihood of applying for a formal loan but do not affect loan approval. The substitution between informal credit and formal credit has been well documented in a number of studies. While informal credit may have a positive impact on the accessibility of microcredit programmes (Khoi et al. 2013), informal loans are a type of supplement to fill the gap left by the formal sector and are preferred (e.g. Duong and Izumida 2002; Guirkinger 2008). In our sample, we observe that the number of informal loans is higher than the number of formal loans while firms reported facing difficulties in formal loan applications. Thus, we use informal loan applications (*Apply for informal loans*) as the instrument in this selection. Our argument is, if firms apply for a loan from informal sources, they are less likely to apply for loans from formal sources. This instrument is valid, as banks cannot observe informal loan applications to make decisions on formal loan applications.

Loan terms

In the third part of the analysis, we consider the disparities in loan maturity terms and interest rates charged to female-owned firms and male-owned firms. Conditional on successful loan applicants, the main equation identifies the differences in loan terms between successful borrowers and unsuccessful borrowers. Our empirical model is as follows:

$$Loan\ terms_{it} = \alpha + \beta Female_{it} + \gamma Social\ capital_{it} + \theta Female\times Social\ capital_{it} + X_{it}\delta + \varepsilon_{it} \quad (3.1)$$

$$Probit(Loan_{it} = 1) = \phi\big(\tilde{\alpha} + \tilde{\beta} Female + \tilde{\gamma} Social\ capital_{it} + \tilde{\theta} Female\times Social\ capital_{it} + X_{it}\tilde{\delta} + \tilde{\psi}_1 Managerial\ time_{it} + \tilde{\psi}_2 Main\ income\ source_{it} + \tilde{\psi}_3 Bribe_{it}\big) \quad (3.2)$$

In selection equation (3.2), $Loan_{it}$ equals 1 if a firm gets a loan and 0 otherwise. This equation is estimated for the sample of firms applying for a bank loan. In the model proposed by Kon and Storey (2003), better preparation of loan applications is one determinant of good applicants. Thus, if a firm is less prepared, it will be less likely to get a loan. Thus, we employ *Managerial time* and *Main income source* as our instruments to control for loan preparation. If the firms are not the main income source of the owners, they will not really bother about whether or not the loan applications are approved. Therefore, the owners would not prepare loan applications properly, resulting in lower probability of getting one. *Managerial time* is the percentage of managers' working time spent each month dealing with government regulations and officials. Since managerial time is limited, the owners who spend significant amounts of time in dealing with government officials might not have enough time to prepare all the formalities related to loan applications. Hence, they are less likely to obtain a formal loan (Muravyev et al. 2009). Furthermore, lending corruption has remained in collectivist societies, especially for small and medium enterprises (El Ghoul et al. 2015; Zheng et al. 2013). Thus, we employ *Bribe* as our third instrument and argue that if a firm pays informal fees, the likelihood of loans being approved is higher.

5 Results

5.1 Gender, social capital, and financial constraints

Table 3 reports our regression results. The regressions in column (1) show the results for the differences in loan applications. The regressions in column (2) show the differences in the

outcomes of actual loan applicants, that is, whether the loan applications are approved or rejected. The dependent variables in columns (3) and (4) are loan duration and interest rates charged, respectively. Conditional on the need for external finance, we do not observe significant differences in the likelihood of applying for formal loans between male- and female-owned firms. However, firms with closer ties to government officials or bankers are more likely to apply for bank loans. This supports the argument that firms with better official relationships are encouraged to apply for formal loans in the hope that they can get loans due to these relationships. Furthermore, as expected, firms that introduce new technology or new products need extra funding for innovation while the need for finance would be reduced by the internal finance generated from within the household.

With regard to the differences in loan approval, firms with female ownership are more likely to obtain a formal loan compared to firms with male ownership. More specifically, conditional on actual loan applications, women-owned firms have a 33 to 42 per cent higher probability of getting loans than male-owned firms. This number is statistically and economically significant. Regarding the employed instrument in the selection equation, we observe that firms are more likely to apply for loans from the informal sector before applying for formal ones.

We also find significant differences in terms of interest rates charged to male and female entrepreneurs, i.e. women pay 0.69 percentage points lower interest rates than men do. However, there is no difference between the loan maturity terms given to male- and female-owned firms. Interestingly, although better social capital does not guarantee a bank loan for firms, relationships with government officials and other business people may help firms to get longer loan terms. In other words, we do find support for the roles of social capital in relaxing financial constraints. Regarding the employed instrument, if the owners spend more time on dealing with government officials, they have less time to prepare for loan applications, resulting in a lower probability of getting a loan.

Overall, our results indicate that firms are more likely to borrow from informal sources before applying for a bank loan. This might be explained by entrepreneurs' ability to get zero interest-rate loans from families and friends. Further, among those that actually apply for a bank loan, women are more likely to get one with more favourable terms. Better loan deals may also be facilitated by better social capital, which is in line with previous studies (e.g. Tenev et al. 2003). One possible explanation is that, due to information asymmetry, banks tend to seek additional information about the firms through firms' social networks. Thus, better social ties may be beneficial to firms.

In terms of the impacts of other owners' characteristics and firms' characteristics, most results are consistent with expectations, i.e. firms whose owners are war veterans or Communist Party members, or firms that follow the accounting standard are encouraged to apply for bank loans. Bigger firms are also more likely to apply for loans but are more likely to get less favourable loan terms with shorter loan duration terms and higher interest rates. Firms that failed to repay debts in the past have poor credit records and are less likely to get new loans. Interestingly, export firms are less likely to get loans. This may be explained by the fact that export firms are not on the list of SMEs that can apply for favourable credit programmes provided by state-owned banks.

5.2 Robustness check

Since sample selection bias remains one of the key challenges in studies about discrimination in lending markets, it is difficult to find a good instrument. One might argue that the instrument *Share of jobs*, employed in the model consisting of equations (1.1) to (1.2), could also affect the likelihood of applying for a bank loan. To check this possibility, we add this variable as another instrument in equation (2.2) and perform Heckman regressions. The results reported in Table 4 show that the

coefficients on this instrument are statistically insignificant in the selection sample, while the effect of gender on loan approval is consistent. Thus, it provides evidence for the validity of the instrument employed in equations (1.1) to (1.2).

Since paying bribes may also help firms to get better loan deals, the use of this variable as an instrument in equation (3.2) might be invalid. To rule out this possibility, we add this variable into equation (3.1) and re-estimate the Heckman estimations. The results reported in Table 5 are relatively consistent with previous findings. That is, interest rates charged to females are lower than those charged to males and social capital helps firms to get longer loan maturity terms. Moreover, the coefficients on *Bribe* are statistically insignificant, suggesting no evidence for lending corruption in the sample.

6 Conclusions and implications

In recent years, the number of SMEs in Viet Nam as well as their role in the development of the economy are growing. However, SMEs in Viet Nam still face some obstacles, particularly in relation to access to finance. Further, because of gender difference, SMEs with female ownership might face more difficulties in accessing finance compared to their male-owned counterparts. Thus, the main aim of this paper is to explore the issues relating to female-owned SMEs' access to finance in Viet Nam, i.e. whether female-owned firms are discriminated against in lending markets. Moreover, since Viet Nam is a somewhat network-oriented economy, it could be the case that access to social networks can mitigate the problem of gender discrimination. Hence, this paper also investigates the role of social capital in relaxing financial constraints as well as its interaction with gender discrimination.

We employ data from the 2011, 2013, and 2015 waves of the Micro, Small and Medium Enterprise Survey in Viet Nam in our analysis. The problems of sample selection bias are addressed by employing Heckman regressions. More specifically, we use Heckman regressions to distinguish the disparities in: (1) probability of applying for formal loans; (2) loan approval between actual loan borrowers and discouraged borrowers; and (3) loan conditions between successful borrowers and unsuccessful borrowers. In contrast to our expectations, the likelihood of female-owned firms obtaining a bank loan is higher than the male-owned ones. Moreover, interest rates charged to female-owned firms are lower than the ones charged to male-owned firms. Regarding the impact of social capital, firms with closer relationships with government officials and bank officials are encouraged to apply for bank loans. While there is no evidence that these firms can get bank loans, a good relationship with officials and other business people may help firms to obtain better deals. Our estimates may be explained by the fact that male entrepreneurs tend to borrow from the informal sector before borrowing from formal credit institutions. Reasons why loans from the informal sector are preferred might include: (1) loans from family and friends are relatively cheaper than formal loans; and (2) it is easier to get loans from informal money lenders. Further, bankers searching for extra information about loan applicants through their social ties could explain the positive effect of social capital on getting better loan conditions.

These results suggest the use of social capital to assist loan applications. More specifically, firms could make use of their ties with government officials and bank officials as well as their relationship with other business people to get better loan terms. Furthermore, current credit programmes with favourable terms targeting SMES are limited to some specific sectors and provinces. Therefore, credit programmes should be open to all SMEs in all sectors while loans with favourable terms (e.g. lower interest rates or longer maturity) could be extended.

References

Ahlstrom, D., and G.D. Bruton (2006). 'Venture Capital in Emerging Economies: Networks and Institutional Change'. *Entrepreneurship Theory and Practice*, 30(2): 299–320.

Alesina, A.F., F. Lotti, and P.E. Mistrulli (2013). 'Do Women Pay More for Credit? Evidence from Italy'. *Journal of the European Economic Association*, 11(s1): 45–66.

Arrow, K.J. (1973). 'The Theory of Discrimination'. In O. Ashenfelter and A. Rees (eds), *Discrimination in Labor Markets*. Princeton, NJ: Princeton University Press.

Asiedu, E., J.A. Freeman, and A. Nti-Addae (2012). 'Access to Credit by Small Businesses: How Relevant are Race, Ethnicity, and Gender?'. *The American Economic Review*, 102(3): 532–37.

Asiedu, E., I. Kalonda-Kanyama, L. Ndikumana, and A. Nti-Addae (2013). 'Access to Credit by Firms in Sub-Saharan Africa: How Relevant is Gender?'. *The American Economic Review*, 103(3): 293–97.

Aterido, R., T. Beck, and L. Iacovone (2013). 'Access to Finance in Sub-Saharan Africa: Is there a Gender Gap?'. *World Development*, 47: 102–20.

Bates, T. (1997). 'Unequal Access: Financial Institution Lending to Black- and White- Owned Small Business Start- ups'. *Journal of Urban Affairs*, 19(4): 487–95.

Beck, T., and A. Demirguc-Kunt (2006). 'Small and Medium-size Enterprises: Access to Finance as a Growth Constraint'. *Journal of Banking & Finance*, 30(11): 2931–43.

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

Blanchard, L., B. Zhao, and J. Yinger (2008). 'Do Lenders Discriminate Against Minority and Woman Entrepreneurs?'. *Journal of Urban Economics*, 63(2): 467–97.

Blanchflower, D.G., P.B. Levine, and D.J. Zimmerman (2003). 'Discrimination in the Small-Business Credit Market'. *Review of Economics and Statistics*, 85(4): 930–43.

Bostic, R.W., and K.P. Lampani (1999). 'Racial Differences in Patterns of Small Business Finance: The Importance of Local Geography'. In *Federal Reserve Bank of Chicago Proceedings*, (No. Mar: 149–79).

Cavalluzzo, K.S., and L.C. Cavalluzzo (1998). 'Market Structure and Discrimination: the Case of Small Businesses'. *Journal of Money, Credit and Banking*, 771–92.

Cavalluzzo, K.S., L.C. Cavalluzzo, and J.D. Wolken, (2002). 'Competition, Small Business Financing, and Discrimination: Evidence from a New Survey'. *The Journal of Business*, 75(4): 641–79.

Cavalluzzo, K., and J. Wolken (2005). 'Small Business Loan Turndowns, Personal Wealth, and Discrimination'. *The Journal of Business*, 78(6): 2153–78.

Cole, R., and T. Sokolyk (2016). 'Who Needs Credit and Who Gets Credit? Evidence from the Surveys of Small Business Finances'. *Journal of Financial Stability*, 24: 40–60.

Coleman, J.S. (1988). 'Social Capital in the Creation of Human Capital'. *American Journal of Sociology*, S95–S120.

Coleman, S. (2000). 'Access to Capital and Terms of Credit: a Comparison of Men-and Women-owned Small Businesses'. *Journal of Small Business Management*, 38(3): 37.

Duong, P.B., and Y. Izumida (2002). 'Rural Development Finance in Vietnam: A Microeconometric Analysis of Household Surveys'. *World Development*, 30(2): 319–35.

El Ghoul, S., O. Guedhami, C.C. Kwok, and X. Zheng (2015). 'Collectivism and Corruption in Commercial Loan Production: How to Break the Curse?'. *Journal of Business Ethics*, 1–26.

Fornoni, M., I. Arribas, and J.E. Vila (2012). 'An Entrepreneur's Social Capital and Performance: The Role of Access to Information in the Argentinean Case'. *Journal of Organizational Change Management*, 25(5): 682–98.

Fraser, S. (2009). 'Is there Ethnic Discrimination in the UK Market for Small Business Credit?'. *International Small Business Journal*, 27(5): 583–607.

Guirkinger, C. (2008). 'Understanding the Coexistence of Formal and Informal Credit Markets in Piura, Peru'. *World Development*, 36(8): 1436–52.

Hansen, H., and J. Rand, (2014a). 'The Myth of Female Credit Discrimination in African Manufacturing'. *Journal of Development Studies*, 50(1): 81–96.

Hansen, H., and J. Rand (2014b). 'Estimates of Gender Differences in Firms Access to Credit in Sub-Saharan Africa'. *Economics Letters*, 123(3): 374–77.

Hussain, J., C. Millman, and H. Matlay (2006). 'SME Financing in the UK and in China: A Comparative Perspective'. *Journal of Small Business and Enterprise Development*, 13(4): 584–99.

Hyytinen, A., and O. Toivanen, (2005). 'Do Financial Constraints Hold Back Innovation and Growth? Evidence on the Role of Public Policy'. *Research Policy*, 34(9):1385–403.

Khoi, P.D., C. Gan, G.V. Nartea, and D.A. Cohen (2013). 'Formal and Informal Rural Credit in the Mekong River Delta of Vietnam: Interaction and Accessibility'. *Journal of Asian Economics*, 26: 1–13.

Kon, Y., and D.J. Storey (2003). 'A Theory of Discouraged Borrowers'. *Small Business Economics*, 21(1): 37–49.

Le, N.T., and T.V. Nguyen (2009). 'The Impact of Networking on Bank Financing: The Case of Small and Medium- Sized Enterprises in Vietnam'. *Entrepreneurship Theory and Practice*, 33(4): 867–87.

Le, N.T., S. Venkatesh, and T.V. Nguyen (2006). 'Getting Bank Financing: A Study of Vietnamese Private Firms'. *Asia Pacific Journal of Management*, 23(2): 209–27.

Madill, J.J., A.L. Riding, and G.H. Haines Jr, (2006). 'Women Entrepreneurs: Debt Financing and Banking Relationships'. *Journal of Small Business & Entrepreneurship*, 19(2): 121–42.

McMillan, J., and C. Woodruff (1999). 'Interfirm Relationships and Informal Credit in Vietnam'. *Quarterly Journal of Economics*, 1285–320.

Meyer, K.E., and H.V. Nguyen (2005). 'Foreign Investment Strategies and Sub- National Institutions in Emerging Markets: Evidence from Vietnam'. *Journal of Management Studies*, 42(1): 63–93.

Muravyev, A., O. Talavera, and D. Schäfer (2009). 'Entrepreneurs' Gender and Financial Constraints: Evidence from International Data'. *Journal of Comparative Economics*, 37(2): 270–86.

Myers, S.C. (2000). 'Outside Equity'. *The Journal of Finance*, 55(3): 1005–37.

Nguyen, P.Q.T., J.R. Stromseth, X.T. Hoang, Q.T. Nguyen, and D.K. Tran (2002). *Business Associations in Vietnam: Status, Roles, and Performance.* Private Sector Discussions No. 13. Mekong Project Development Facility and the Asia Foundation.

Nguyen, T.V., N.T.B. Le, and N.J. Freeman (2006). 'Trust and Uncertainty: A Study of Bank Lending to Private SMEs in Vietnam'. *Asia Pacific Business Review*, 12(4): 547–68.

O'Connor, D. (2000). 'Financial Sector Reform in China and Viet Nam: a Comparative Perspective'. *Comparative Economic Studies*, 42(4): 45–66.

Phelps, E.S. (1972). 'The Statistical Theory of Racism and Sexism'. *The American Economic Review*, 62(4): 659–61.

Storey, D.J. (2004). 'Racial and Gender Discrimination in the Micro Firms Credit Market?: Evidence from Trinidad and Tobago'. *Small Business Economics*, 23(5): 401–22.

Swierczek, F.W. (1994). 'Culture and Conflict in Joint Ventures in Asia'. *International Journal of Project Management*, 12(1): 39–47.

Talavera, O., L. Xiong, and X. Xiong (2012). 'Social Capital and Access to Bank Financing: the Case of Chinese Entrepreneurs'. *Emerging Markets Finance and Trade*, 48(1): 55–69.

Tenev, S., A. Carlier, O. Chaudry, and Q.T. Nguyen (2003*). Informality and the Playing Field in Vietnam's Business Sector*. Washington, DC: World Bank Publications.

Treichel, M.Z., and J.A. Scott (2006). 'Women-owned Businesses and Access to Bank Credit: Evidence from Three Surveys Since 1987'. *Venture Capital*, 8(1): 51–67.

Ughetto, E. (2008). 'Does Internal Finance Matter for R&D? New Evidence from a Panel of Italian Firms'. *Cambridge Journal of Economics*, 32(6): 907–25.

UNU-WIDER (2016). 'Micro, Small and Medium Enterprises in Vietnam. [Online] Available at: https://www.wider.unu.edu/opportunity/micro-small-and-medium-enterprises-vietnam (accessed on 11 March 2017).

Van de Ven, W.P., and B.M. Van Praag (1981). 'The Demand for Deductibles in Private Health Insurance: A Probit Model with Sample Selection'. *Journal of Econometrics*, 17(2): 229–52.

Vos, E., A.J.Y. Yeh, S. Carter, and S. Tagg (2007). 'The Happy Story of Small Business Financing'. *Journal of Banking & Finance*, 31(9): 2648–72.

Wells, M. (2005). *Viet Nam: Gender Situation Analysis*. Asian Development Bank. [Online] Available at: https://www.adb.org/sites/default/files/institutional-document/32246/cga-viet-nam.pdf (accessed on 11 March 2017).

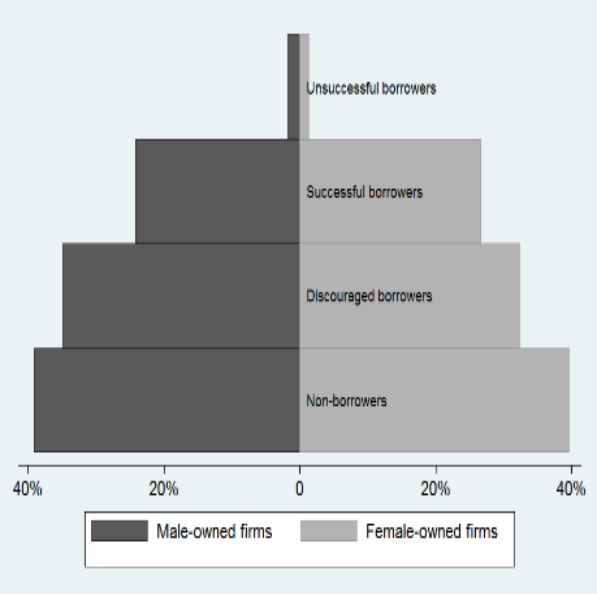
World Bank (2011). 'Vietnam—Country Gender Assessment'. Washington, DC: World Bank. Available at: http://documents.worldbank.org/curated/en/894421468321306582/Vietnam-Country-gender-assessment (accessed on 11 March 2017).

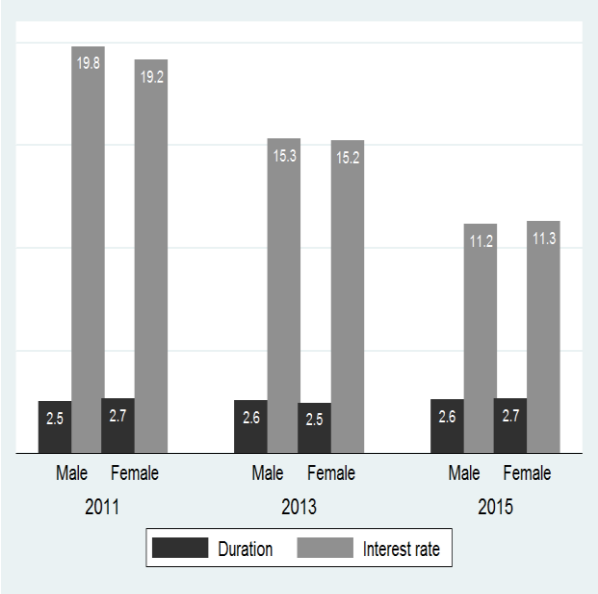
World Bank (2015). 'Business Environment in Vietnam—World Bank Enterprise Survey of Business Managers'. World Bank Group. [Online] Available at: http://www.enterprisesurveys.org/data/exploreeconomies/2015/vietnam (accessed on 11 March 2017).

World Bank (2016). 'Vietnam—Gender Gap Narrowed, yet Vietnam still Faces Challenges, World Bank Report Says'. [Online] Available at: http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/VIETNAMEXTN/0,,contentMDK:23067494~menuPK:3968140~pagePK:64027988~piPK:64027986~theSitePK:387565,00.html (accessed on 11 March 2017).

Zheng, X., S. El Ghoul, O. Guedhami, and C.C. Kwok (2013). 'Collectivism and Corruption in Bank Lending'. *Journal of International Business Studies*, 44(4): 363–90.

Figure 1: Differences between male- and female-owned firms in credit needs and formal loan conditions



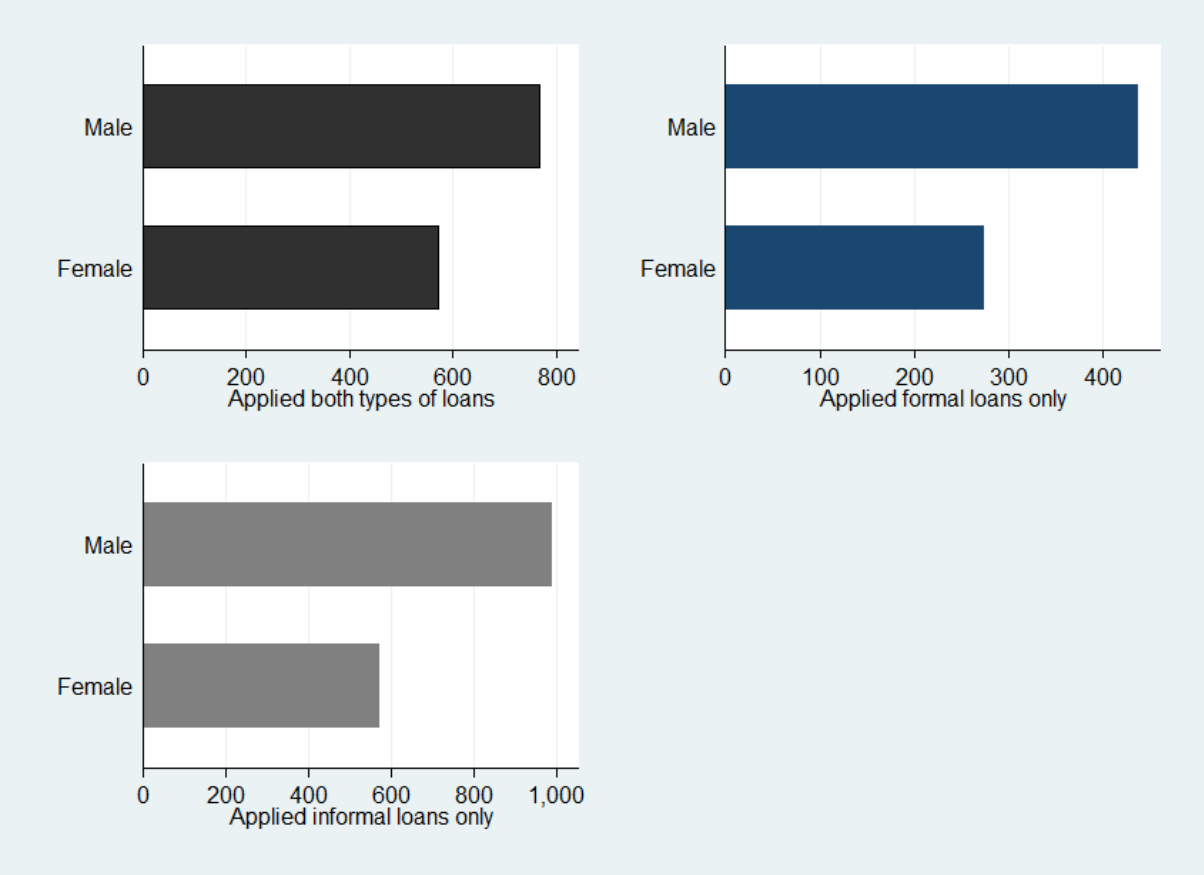


Panel A. Credit needs of firms	Panel B. Interest rates and loan maturity over time

Note: Panel A presents the differences in credit needs as well as loan approval rates between female- and male-owned firms. Panel B compares formal interest rates and formal loan maturity of female- and male-owned firms over time.

Source: Authors' own calculations.

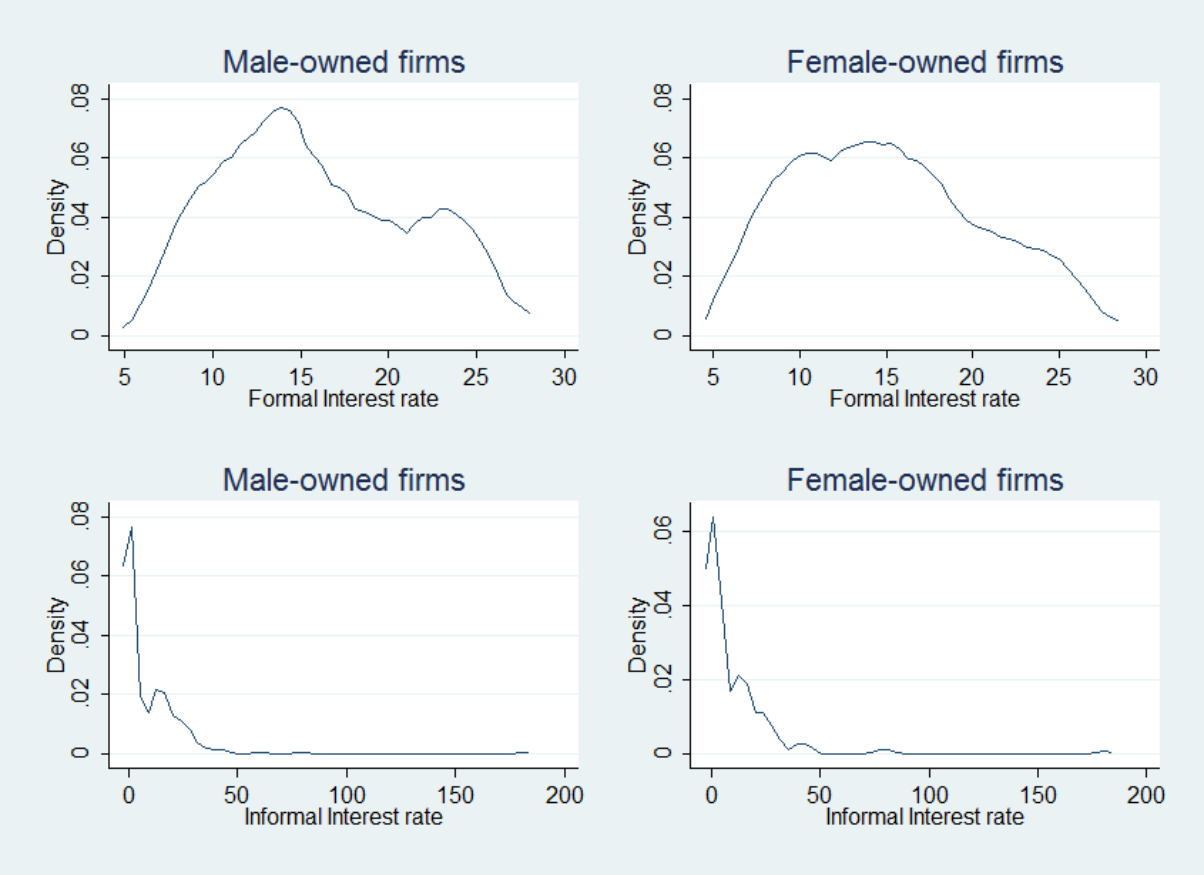
Figure 2: Loan applications by type and gender



Note: This figure shows the number of loan applications made by male-owned and female-owned firms.

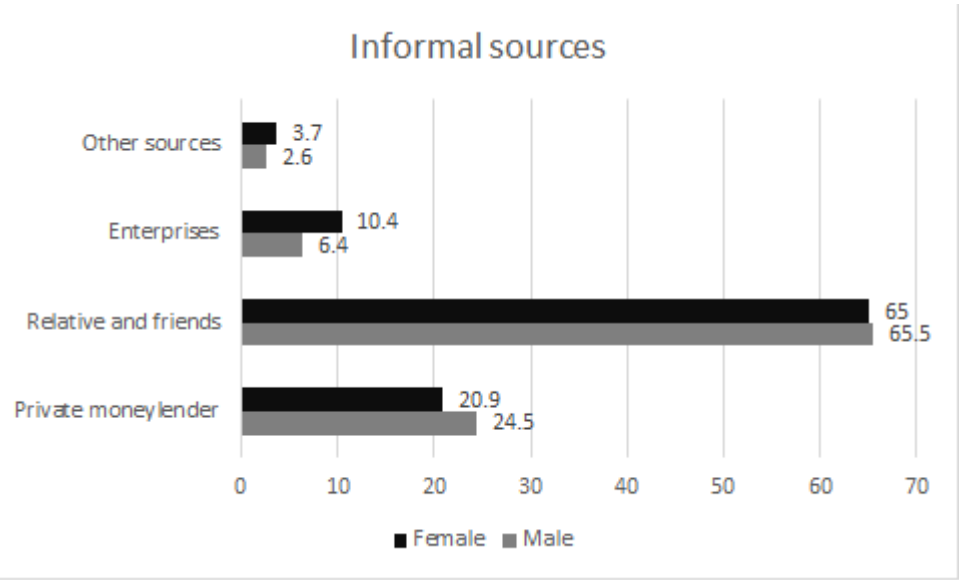
Source: Authors' own calculations.

Figure 3: Interest rates charged to male-owned and female-owned firms



Source: Authors' own calculations.

Figure 4: Sources of informal loans



Source: Authors' own calculations.

Table 1: Descriptive statistics for whole sample

	Mean	SD	Observations
		Firms' financial need	
Need	0.591	0.492	4,868
		Formal loans	
Apply	0.238	0.426	4,868
Loan	0.933	0.249	1,157
		Informal loans	
Apply	0.540	0.498	4,869
Loan	0.374	2.229	2,631
		Loan conditions	
		Formal loans	
Duration	1.423	1.246	1,083
Interest	15.738	5.383	1,080
		Informal loans	
Duration	1.800	3.792	781
Interest	8.499	16.108	780
		Social capital	
Business network	0.379	0.485	4,869
Official network	0.331	0.471	4,869
		Owner's characteristics	
Female	0.282	0.450	4,869
Age	50.063	9.864	4,869
Veteran/Communist	0.020	0.141	4,869
Ethnicity	0.933	0.249	4,869
Education	-0.155	1.086	4,868
Previous job status	0.462	0.499	4,869
		Firms' characteristics	
Bad credit history	0.037	0.189	3,166
ROA	0.201	0.213	4,869
Firm age	17.544	9.808	4,867
Size	7.020	1.530	4,869
Export	0.043	0.203	4,856
Accounting	0.288	0.453	4,869

Notes: This table presents descriptive statistics for all firms. 'Need' equals 1 if firms reported a need of loans, 0 otherwise. 'Apply' equals 1 if firms apply for a loan, 0 otherwise. 'Loan' equals 1 if firms got a loan, 0 if loan applications are rejected. 'Duration' is the loan maturity (in months). 'Interest' is annual interest rate charged. 'Business network' equals 1 if firms have regular contacts with at least 20 business people and firms got assistance from them in the last 3 months; 0 otherwise. 'Official network' equals 1 if firms have regular contact with at least 10 bank officials or government officials and got assistance from them in the last 3 months; 0 otherwise. 'Veteran/Communist' equals 1 if the owner/manager is a war veteran or a member of the Communist Party, 0 otherwise. 'Ethnicity' equals 1 if the owner/manager is ethnic majority, 0 otherwise. 'Education' is the first component of principal component analysis of two scales: (1) basic education, which equals 1 if the owner/manager finished high school, 0 otherwise; and (2) professional education, which equals 1 if the owner had college or university degree, 0 otherwise. 'Previous job status' equals 1 if the owners' previous job is wage employee, 0 otherwise. 'ROA' is return on assets. 'Age' is the owner's age (by the survey year). 'Firm age' is the firm's age (by the survey year). 'Size' is the natural logarithm of firms' assets. 'Export' equals 1 if the firm has direct export activity, 0 otherwise. 'Accounting' equals 1 if the firm follows the accounting standard in accordance with government guidelines, 0 otherwise.

Source: Authors' own calculations.

Table 2: Descriptive statistics by gender

	Mean_M	SD_M	Obs.	Mean_F	SD_F	Obs.	$\text{Mean}_M - \text{Mean}_F$
			Firms' financial need				
Need	0.613	0.487	3,495	0.533	0.499	1,373	0.080***
Formal loans							
Apply	0.257	0.437	3,495	0.192	0.394	1,373	0.065***
Loan	0.925	0.263	895	0.962	0.192	262	-0.037**
			Informal loans				
Apply	0.554	0.497	3,496	0.505	0.500	1,373	0.049***
Loan	0.395	2.512	1,936	0.318	1.103	695	0.077
			Loan conditions				
			Formal loans				
Duration	1.394	1.232	830	1.517	1.287	253	-0.123
Interest	15.890	5.384	829	15.236	5.360	251	0.654*
			Informal loans				
Duration	1.856	4.091	619	1.583	2.316	162	0.274
Interest	8.262	15.281	618	9.402	18.959	162	-1.140
			Social capital				
Business network	0.366	0.482	3,496	0.410	0.492	1,373	-0.044***
Official network	0.338	0.473	3,496	0.312	0.464	1,373	0.026*
			Owners' characteristics				
Age	48.083	9.892	3,496	47.838	9.659	1,373	0.245
Veteran/Communist	0.025	0.157	3,496	0.008	0.089	1,373	0.017***
Ethnicity	0.941	0.235	3,496	0.913	0.281	1,373	0.028***
Education	-0.098	1.041	3,495	-0.299	1.181	1,373	0.200***
Previous job status	0.496	0.500	3,496	0.377	0.485	1,373	0.119***
			Firms' characteristics				
Bad credit history	0.040	0.197	2,355	0.028	0.166	811	0.012
ROA	0.195	0.208	3,496	0.215	0.226	1,373	-0.020***
Firm age	15.415	9.657	3,494	15.697	10.430	1,373	-0.282
Size	7.084	1.504	3,496	6.859	1.582	1,373	0.225***
Export	0.044	0.205	3,485	0.041	0.198	1,371	0.003
Accounting	0.284	0.451	3,496	0.299	0.458	1,373	-0.015

Notes: This table presents descriptive statistics by gender. 'Need' equals 1 if firms reported a need of loans, 0 otherwise. 'Apply' equals 1 if firms apply for a loan, 0 otherwise. 'Loan' equals 1 if firms got a loan, 0 if loan applications are rejected. 'Duration' is the loan maturity (in months). 'Interest' is annual interest rate charged. 'Business network equals 1 if firms have regular contacts with at least 20 business people and firms got assistance from them in the last 3 months; 0 otherwise. 'Official network' equals 1 if firms have regular contact with at least 10 bank officials or government officials and got assistance from them in the last 3 months; 0 otherwise. 'Veteran/Communist' equals 1 if the owner/manager is a war veteran or a member of the Communist Party, 0 otherwise. 'Ethnicity' equals 1 if the owner/manager is ethnic majority, 0 otherwise. 'Education' is the first component of principal component analysis of two scales: (1) basic education, which equals 1 if the owner/manager finished high school, 0 otherwise; and (2) professional education, which equals 1 if the owner had college or university degree, 0 otherwise. 'Previous job status' equals 1 if the owners' previous job is waged employee, 0 otherwise. 'ROA' is return on assets. 'Age' is the owner's age (by the survey year). 'Firm age' is the firm's age (by the survey year). 'Size' is the natural logarithm of firms' assets. 'Export' equals 1 if the firm has direct export activity, 0 otherwise. 'Accounting' equals 1 if the firm follows the accounting standard in accordance with government guidelines, 0 otherwise.

*, **, and *** denote significance for t-tests at 10%, 5%, and 1%, respectively.

Source: Authors' own calculations.

Table 3: Gender discrimination, social capital and access to finance

	Panel A. Social capital indicator: Business network			
	(1)	(2)	(3)	(4)
	Apply	Loan	Duration	Interest
Female	0.011	0.329**	0.049	-0.687*
	(0.070)	(0.142)	(0.058)	(0.365)
Business network	0.059	0.001	0.085*	0.099
	(0.062)	(0.119)	(0.047)	(0.292)
Female×Business network	-0.035	0.011	0.035	-0.357
	(0.056)	(0.154)	(0.045)	(0.281)
Ethnicity	0.281	-0.271	-0.305*	-0.370
	(0.174)	(0.335)	(0.164)	(1.022)
Education	-0.021	-0.030	0.023	-0.021
	(0.032)	(0.072)	(0.025)	(0.155)
Bad credit history	0.227	-0.468**	-0.104	0.088
	(0.152)	(0.203)	(0.096)	(0.595)
Veteran/Communist	0.457**	-0.019	-0.065	-0.770
	(0.208)	(0.330)	(0.131)	(0.805)
ROA	0.264	-0.170	-0.012	0.011
	(0.173)	(0.321)	(0.126)	(0.789)
Age	-0.157	-0.154	-0.078	-0.665
	(0.168)	(0.296)	(0.119)	(0.743)
Firm age	-0.027	-0.013	-0.030	0.095
	(0.048)	(0.089)	(0.037)	(0.230)
Size	0.237***	0.103	-0.069***	0.298**
	(0.041)	(0.069)	(0.023)	(0.142)
Export	0.160	-0.428**	0.040	-0.218
	(0.128)	(0.210)	(0.087)	(0.543)
Accounting	0.151*	0.167	0.044	0.301
	(0.082)	(0.182)	(0.064)	(0.398)
	Selection equation instruments			
	Need	Apply	Loan	Loan
Innovation	0.191***			
	(0.064)			
Share of waged jobs	-0.140**			
	(0.061)			
Apply for informal loan		-0.801***		
		(0.073)		
Firm is main income source			-0.013	-0.010
			(0.366)	(0.365)
Managerial time			-0.068**	-0.067**
			(0.033)	(0.033)
Bribe			0.017	0.023
			(0.203)	(0.203)
Sector fixed-effects	Yes	Yes	Yes	Yes
Province fixed-effects	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes
Observations	3,102	2,254	2,247	2,249
	Panel B. Social capital indicator: Official network			
	Apply	Loan	Duration	Interest
Female	-0.039	0.421***	0.041	-0.529
	(0.074)	(0.154)	(0.056)	(0.360)
Official network	0.241***	0.030	0.105*	-0.242
	(0.072)	(0.117)	(0.061)	(0.393)
Female×Official network	0.165***	0.247	-0.014	-0.466
	(0.059)	(0.185)	(0.050)	(0.322)
Ethnicity	0.349*	-0.363	-0.115	-0.775
	(0.183)	(0.339)	(0.155)	(0.984)
Education	-0.028	-0.011	0.031	0.020
	(0.033)	(0.073)	(0.024)	(0.156)
Bad credit history	0.234	-0.495**	0.029	-0.431
	(0.155)	(0.202)	(0.091)	(0.581)
Veteran/Communist	0.440**	-0.052	-0.001	-0.749
	(0.208)	(0.335)	(0.140)	(0.892)

ROA	0.287	-0.200	-0.018	0.045
	(0.177)	(0.332)	(0.127)	(0.818)
Age	-0.124	-0.082	-0.090	-0.161
	(0.169)	(0.308)	(0.121)	(0.777)
Firm age	-0.037	-0.029	-0.019	-0.066
	(0.049)	(0.093)	(0.035)	(0.227)
Size	0.243***	0.100	-0.031	0.024
	(0.040)	(0.068)	(0.045)	(0.290)
Export	0.146	-0.484**	0.080	-0.559
	(0.130)	(0.218)	(0.080)	(0.514)
Accounting	0.135	0.148	0.026	0.127
	(0.083)	(0.183)	(0.064)	(0.409)
	Selection equation instruments			
	Need=1	Apply=1	Loan=1	Loan=1
Innovation	0.161**			
	(0.067)			
Share of jobs	-0.140**			
	(0.063)			
Apply for informal loan		-0.846***		
		(0.075)		
Firm is main income source			-0.010	-0.007
			(0.365)	(0.364)
Managerial time			-0.059*	-0.058*
			(0.033)	(0.033)
Bribe			0.004	0.008
			(0.199)	(0.199)
Sector fixed-effects	Yes	Yes	Yes	Yes
Province fixed-effects	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes
Observations	3,102	2,254	978	979

Notes: This table presents regressions results with sample selection. Panel A and Panel B present results for regressions with 'business network' and 'official network' as the indicators of social capital, respectively. Regressions in columns (1) and (2) are estimated using Heckprobit estimation while regressions in column (3) and (4) are estimated using Heckman estimations. Robust standard errors are reported in parentheses. In all regressions, a constant term, year fixed-effects, and firm fixed-effects are estimated but not reported.

'Need' equals 1 if firms reported a need of loans, 0 otherwise. 'Apply' equals 1 if firms apply for a loan, 0 otherwise. 'Loan' equals 1 if firms got a loan, 0 if loan applications are rejected. 'Duration' is the loan maturity (in months). 'Interest' is annual interest rate charged.' Business network' equals 1 if firms have regular contacts with at least 20 business people and firms got assistance from them in the last 3 months; 0 otherwise. 'Official network' equals 1 if firms have regular contact with at least 10 bank officials or government officials and got assistance from them in the last 3 months; 0 otherwise. 'Veteran/Communist' equals 1 if the owner/manager is a war veteran or a member of the Communist Party, 0 otherwise. 'Ethnicity' equals 1 if the owner/manager is ethnic majority, 0 otherwise. 'Education' is the first component of principal component analysis of two scales: (1) basic education, which equals 1 if the owner/manager finished high school, 0 otherwise; and (2) professional education, which equals 1 if the owner had college or university degree, 0 otherwise. 'Previous job status' equals 1 if the owners' previous job is waged employee, 0 otherwise. 'ROA' is return on assets. 'Age' is the owners' age (by the survey year). 'Firm age' is the firm's age (by the survey year). 'Size' is the natural logarithm of firms' assets. 'Export' equals 1 if the firm has direct export activity, 0 otherwise. 'Accounting' equals 1 if the firm follows the accounting standard in accordance with government guidelines, 0 otherwise. 'Apply for informal loan' is a dummy variable that equals 1 if the firm applies for an informal loan, 0 otherwise. 'Share of jobs' is the ratio of number of jobs over total number of working-age adults in the household. 'Innovation' is a dummy that equals 1 if the firm has introduced new technology or new product, 0 otherwise. 'Main income source' is a dummy that equals 1 if the owner reported that firm is the main income source, 0 otherwise. 'Managerial time' is the percentage of working time spent on dealing with government regulations and officials. 'Bribe' is a dummy that equals 1 if the firms pay informal fees, 0 otherwise.

*, **, and *** denote significance at 10%, 5%, and 1%, respectively.

Source: Authors' own calculations.

Table 4: Robustness check: *Share of job* as an instrument in selection equation in loan approval model

	Loan	Loan
	(1)	(2)
Female	0.341**	0.418***
	(0.143)	(0.157)
Business network	0.054	
	(0.120)	
Female×Business network	-0.003	
	(0.150)	
Official network		0.006
		(0.119)
Female*Official network		0.249
		(0.183)
Ethnicity	-0.242	-0.326
	(0.324)	(0.335)
Education	-0.047	-0.033
	(0.071)	(0.074)
Bad credit history	-0.479**	-0.500**
	(0.199)	(0.203)
Veteran/Communist	-0.036	-0.071
	(0.330)	(0.338)
ROA	-0.098	-0.119
	(0.333)	(0.338)
Age	-0.071	-0.010
	(0.298)	(0.309)
Firm age	0.009	-0.010
	(0.086)	(0.092)
Size	0.093	0.096
	(0.067)	(0.069)
Export	-0.468**	-0.520**
	(0.212)	(0.221)
Accounting	0.197	0.169
	(0.179)	(0.185)
	Selection equation instruments	
	Apply=1	Apply=1
Apply for informal loan	-0.803***	-0.846***
	(0.074)	(0.075)
Share of jobs	-0.072	-0.083
	(0.071)	(0.072)
Sector fixed-effects	Yes	Yes
Province fixed-effects	Yes	Yes
Year fixed-effects	Yes	Yes
Observations	2,226	2,226

Notes: This table presents robustness checks for loan approval model. Regressions are estimated using Heckprobit estimations. Robust standard errors are reported in parentheses. In all regressions, a constant term, 'year fixed-effects' and 'firm fixed-effects' are estimated but not reported. 'Apply' equals 1 if firms apply for a loan, 0 otherwise. 'Loan' equals 1 if firms got a loan, 0 if loan applications are rejected. 'Business network' equals 1 if firms have regular contacts with at least 20 business people and firms got assistance from them in the last 3 months; 0 otherwise. 'Official network' equals 1 if firms have regular contact with at least 10 bank officials or government officials and got assistance from them in the last 3 months; 0 otherwise. 'Veteran/Communist' equals 1 if the owner/manager is a war veteran or a member of the Communist Party, 0 otherwise. 'Ethnicity' equals 1 if the owner/manager is ethnic majority, 0 otherwise. 'Education' is the first component of principal component analysis of two scales: (1) basic education, which equals 1 if the owner/manager finished high school, 0 otherwise; and (2) 'professional education' which equals 1 if the owner had college or university degree, 0 otherwise. 'Previous job status' equals 1 if the owner's previous job is waged employee, 0 otherwise. 'ROA' is return on assets. 'Age' is the owner's age (by the survey year). 'Firm age' is the firm's age (by the survey year). 'Size' is the natural logarithm of firms' assets. 'Export' equals 1 if the firm has direct export activity, 0 otherwise. 'Accounting' equals 1 if the firm follows the accounting standard in accordance with government guidelines, 0 otherwise. 'Apply for informal loan' is a dummy variable that equals 1 if the firm applies for an informal loan, 0 otherwise. 'Share of jobs' is the ratio of number of jobs over total number of working-age adults in the household.

*, **, and *** denote significance at 10%, 5%, and 1%, respectively.

Source: Authors' own calculations.

Table 5: Robustness check: impact of *Bribe* on loan terms

	Duration (1)	Duration (2)	Interest (3)	Interest (4)
Female	0.049	0.099	-0.687*	-0.619
	(0.058)	(0.067)	(0.365)	(0.402)
Business network	0.081*		0.099	
	(0.047)		(0.293)	
Female×Business network	0.035		-0.357	
	(0.045)		(0.281)	
Official network		0.052		0.382
		(0.046)		(0.273)
FemalexOfficial network		-0.052		-0.142
		(0.045)		(0.268)
Ethnicity	-0.298*	-0.294*	-0.370	-0.373
	(0.163)	(0.171)	(1.023)	(1.019)
Education	0.023	0.026	-0.021	-0.023
	(0.025)	(0.026)	(0.155)	(0.156)
Bad credit history	-0.103	-0.132	0.088	0.081
	(0.096)	(0.100)	(0.595)	(0.594)
Veteran/Communist	-0.071	-0.071	-0.769	-0.813
	(0.131)	(0.137)	(0.806)	(0.809)
ROA	-0.015	-0.023	0.012	0.058
	(0.126)	(0.132)	(0.789)	(0.793)
Age	-0.077	-0.091	-0.665	-0.593
	(0.119)	(0.125)	(0.743)	(0.746)
Firm age	-0.030	-0.034	0.095	0.092
	(0.037)	(0.039)	(0.230)	(0.231)
Size	-0.070***	-0.057**	0.298**	0.294**
	(0.023)	(0.024)	(0.142)	(0.141)
Export	0.041	0.020	-0.218	-0.261
	(0.087)	(0.091)	(0.543)	(0.544)
Accounting	0.031	0.050	0.302	0.266
	(0.065)	(0.068)	(0.406)	(0.409)
Bribe	0.052	0.053	-0.003	-0.078
	(0.053)	(0.056)	(0.331)	(0.335)
	Selection equation instruments			
	Loan=1	Loan=1	Loan=1	Loan=1
Firm is main income source	-0.013	-0.010	-0.010	-0.007
	(0.366)	(0.365)	(0.365)	(0.364)
Managerial time	-0.068**	-0.059*	-0.067**	-0.058*
	(0.033)	(0.033)	(0.033)	(0.033)
Bribe	0.017	0.004	0.023	0.008
	(0.203)	(0.199)	(0.203)	(0.199)
Sector fixed-effects	Yes	Yes	Yes	Yes
Province fixed-effects	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes
Observations	978	978	979	979

Notes: This table presents robustness checks for loan terms model. Regressions in columns (1) to (4) are estimated using Heckman estimations. Robust standard errors are reported in parentheses. In all regressions, a constant term, 'year fixed-effects' and 'firm fixed-effects' are estimated but not reported. 'Loan' equals 1 if firms got a loan, 0 if loan applications are rejected. 'Duration' is the loan maturity (in months). 'Interest' is annual interest rate charged. 'Business network' equals 1 if firms have regular contacts with at least 20 business people and firms got assistance from them in the last 3 months; 0 otherwise. 'Official network' equals 1 if firms have regular contact with at least 10 bank officials or government officials and got assistance from them in the last 3 months; 0 otherwise. 'Veteran/Communist' equals 1 if the owner/manager is a war veteran or a member of the Communist Party, 0 otherwise. 'Ethnicity' equals 1 if the owner/manager is ethnic majority, 0 otherwise. 'Education' is the first component of principal component analysis of two scales: (1) basic education, which equals 1 if the owner/manager finished high school, 0 otherwise; and (2) 'professional education' which equals 1 if the owner had college or university degree, 0 otherwise. 'Previous job status' equals 1 if the owner's previous job is waged employee, 0 otherwise. 'ROA' is return on assets. 'Age' is the owners' age (by the survey year). 'Firm age' is the firm's age (by the survey year). 'Size' is the natural logarithm of firm's assets. 'Export equals' 1 if the firm has 'direct export activity, 0 otherwise. 'Accounting' equals 1 if the firm follows the accounting standard in accordance with government guidelines, 0 otherwise. 'Main income source' is a dummy that equals 1 if the owner reported that firm is the main income source, 0 otherwise. 'Managerial time' is the percentage of working time spent on dealing with government regulations and officials. 'Bribe' is a dummy that equals 1 if the firms pay informal fees, 0 otherwise. *, **, and *** denote significance at 10%, 5% and 1%, respectively.
Source: Authors' own calculations.

Appendix

Table A1: Variable description

Variables	Definition
Need	1 if firms reported a need of loan, 0 otherwise.
Apply	1 if firms apply for a formal loan, 0 otherwise.
Loan	1 if firms got a formal loan, 0 otherwise.
Duration	Natural logarithm of loan maturity (in months).
Interest	Annual interest rate charged (%).
Business network	1 if the firm has regular contacts with at least 20 business people and firms got assistance from them in the last 3 months; 0 otherwise.
Official network	1 if firms have regular contact with at least 10 bank officials or government officials and got assistance from them in the last 3 months; 0 otherwise.
Ethnicity	1 if the owner/manager is ethnic majority, 0 otherwise.
Age	Natural logarithm of the owner's age.
Veteran/Communist	1 if the owner/manager is a war veteran or a member of the Communist Party, 0 otherwise.
Education	First component of principal component analysis of two scales: (1) basic education, which equals 1 if the owner/manager finished high school, 0 otherwise; and (2) professional education which equals 1 if the owner had college or university degree, 0 otherwise.
Previous job status	1 if the owner's previous job is wage employee, 0 otherwise.
ROA	Return on assets (%).
Firm age	Natural logarithm of the firm's age.
Size	Natural logarithm of firm's assets.
Export	1 if the firm has direct export activity, 0 otherwise.
Accounting	1 if the firm follows the accounting standard in accordance with government guidelines, 0 otherwise.
Bad credit history	1 if the firm fails to service its debt, 0 otherwise.
Apply for informal loan	1 if the firm applies for an informal loan, 0 otherwise.
Share of jobs	Ratio of number of jobs over total number of working-age adults in the household.
Innovation	1 if the firm has introduced new technology or new product, 0 otherwise.
Main income source	1 if the owner reported that firm is the main income source, 0 otherwise.
Managerial time	Percentage of working time spent on dealing with government regulations and officials (%).
Bribe	1 if the firm pays informal fees, 0 otherwise.

Source: Authors' illustration.