Working Paper 189/19

CREDIT ACCESS AND APPROVAL

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May 2019

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Abstract

This work focuses on the credit access and credit demand of Italian firms using a sample representative of Italian firms. We investigate whether the gender of the decision-maker of the firm affects the demand for credit and we focus on regional differences in credit access and denial. Results suggest that women are significantly less likely to ask for credit, while no significant differences in credit approval are found between the two genders.

JEL codes: D22, H81, J16
Keywords: Credit demand, Italian firms, Gender

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We wish to thank Jochem de Bresser, Adrian Kalwij, Marike Knoef, Arthur van Soest and Davide Vannoni for all useful comments and suggestions. We are also grateful to the participants of the Second International Conference Risk Management, University of Turin.

1 Introduction

Discrimination in obtaining credit exists if people of different races or gender, controlling for all other factors, have different access to credit by having different probability of obtaining a loan or getting it at a different rate (Asiedu et al., 2012). Prior research has identified limited access to financial capital as one of the major causes decreasing women's ability to launch and grow entrepreneurial firms (Coleman et al., 2018). Several papers focused on whether discrimination is at work and to what extent (Brush et al., 2018). Looking, in particular, at the gender dimension, the empirical literature shows that indeed women receive less favourable treatment in the credit market (Chaudhuri et al., 2018).

Credit approval, however, is conditional on having asked for credit. Asking for credit is an individual choice, a complex process that underlies several mechanisms at work leading to the decision on whether to consider credit to fund an investment. Focusing on credit for firms' investment, rather than credit for consumption, the firm structure (e.g., business size, age, and sector of activity) would undeniably play a key role in shaping funding channels for an investment.

Would women differ in the way they fund an investment for their firms?

Female- and male-led enterprises show significant differences in the financial structure (see Cesaroni (2010), for a survey, and more recently Stefani & Vacca (2013)). Evidence shows that women-led firms rely less on external capital than personal one, and they tend to start with relatively lower capital. This evidence is also shown in future investments (Carter & Shaw (2006); Coleman & Robb (2009)).

Why should the capital structure of firms differ between genders?

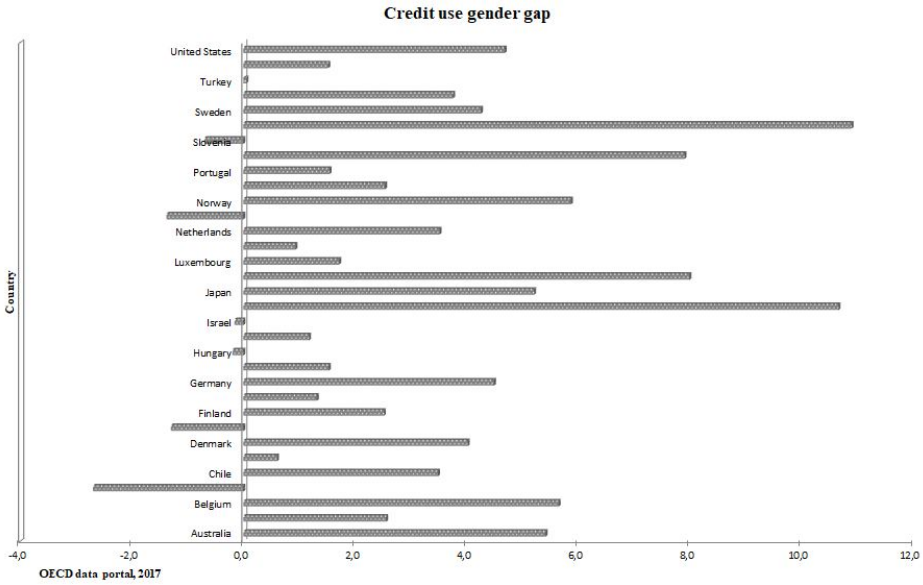
Women experience more troubles in getting funded. Some sources of finance, such as venture capital, fund very few women-led businesses (3% of total venture capitals are those funded and led by women, as written in the Babcock report[1]). This low percentage could also be explained by the fact that few female enterprises use venture capital to a very limited extent

[1]http://www.babson.edu/news-events/babson-news/Pages/140930-venture-capital-funding-women-entrepreneurs-study.aspx

(Aspray & Cohoon, 2007). All evidence leads to an ex-ante expectation of lower exposure to external capital when the firm is led by a woman.

Italy is a good candidate to analyse this issue. Italy, together with Spain, shows a credit demand gender gap of 10% in favour of men, which stands as the highest gap across OECD countries (OECD data portal, 2017). Given the importance of credit to fund an investment, we believe that access to credit and its determinant are a pivotal engine for growth of female led firms. Hence, understanding credit demand drivers would be of high value added especially in a country where women are less active in the credit market.

Figure 1: Credit Use Gender Gap



We investigate the drivers of credit demand and successfulness of credit applications by using a unique firm-level dataset, the RIL, on a sample representative of Italian firms. The main features of female firms, other than capital structure, are that they are on average younger and smaller than male businesses, and more concentrated in the commercial and service sectors. Controlling for the type of business led by women will purge the data from the relationship between external finance and female-led firms.

Being able to draw on a survey that is representative of the whole sample of Italian firms, excluding the agricultural sector, is a clear advantage. We claim, indeed, that our results

can be generalised to the whole population of firms. We also break down the results between types of firm ownership and dimension. As we want to highlight whether gender leadership matters on credit decisions, we consider a female led firm if the decision-maker in the firm is a woman (the questionnaire identifies the person who is responsible for the firm, whether the CEO, manager, or owner). Our approach is similar in spirit to that of Ghignoni et al. (2018) who, using the same dataset, identify whether more educated firm leaders are also associated with fewer temporary jobs in the firm they lead.

In principle, one might argue that the gender of the decision-maker is a choice that can be determined by similar (unobserved) factors as credit applications or credit approval chances of the firm (or might even be affected by credit approval history). This is something we cannot analyse with the data at hand. If it is indeed the case, we cannot make any causal inference but only detect correlations.

On one hand, results show that credit is asked by women less often than by men. When the responsible person of a firm is a woman, she asks less for credit, showing less propensity to search for loan funding. On the other hand, results on being successful in obtaining credit do not show evidence of gender bias. Evidence points to a lower demand of women-led businesses rather than a lower probability of success in obtaining credit.

The rest of this paper is laid out as follows. In section 2, we revise the main contributions in this area of empirical research. In section 3, we describe the data and how the sample is built up, and we provide the main descriptive statistics. Section 4 illustrates our regression results and the specification model, and section 5 concludes the paper.

2 Conceptual Framework and Literature Review

Small businesses led by women do not access credit on equal footing with those led by men. There is relevant evidence pointing in this direction, even if the issue is still controversial. The problem seems to emerge and has been explored in the literature at three different levels (see Table 1).

First level: Companies managed by women tend to apply less frequently for loans.

A few papers find that women-led SMEs tend to request fewer loans and finance their activity to a greater extent with their own funds or trade credit. Coleman (2000) finds that women-owned small businesses tend to rely less on external financing as a source of capital, despite not being discriminated against when applying for loans. Ongena & Popov (2016) explore the issue using a sample of European immigrants to the US. They find that female-owned SMEs apply less frequently for loans and that the phenomenon is positively correlated to the intensity of gender bias in the mother country of the immigrant. The gender bias measure is built on the basis of the answers given by survey respondents to a particular question focused on the role of women within the family.

A voice out of chorus is a paper by Stefani & Vacca (2013). These authors claim that the different frequencies in loan applications between men-led and women-led SMEs disappears when controlling more attentively for firm-specific features.

Second level: When applying for credit, SMEs managed by women face rejection more frequently than male companies do.

The evidence is more controversial on this second issue. Asiedu et al. (2012) explore both racial and gender discrimination in the access to credit, finding a higher denial rate for all minorities compared to small businesses owned by white men. Bellucci et al. (2010) show that female entrepreneurs face tighter credit availability and are more likely to pledge collateral. Cesaroni et al. (2013) find that during the subprime financial crisis, women-run firms suffered from a more pronounced contraction of credit availability, after controlling for all the observable characteristics of the firms. However, they do not have data on loan applications to understand if the greater credit rationing was due to supply-driven discrimination, demand-driven factors, or a combination of both.

On the contrary, other papers report no substantial difference in the availability of credit for female businesses when controlling for the sector, the dimension, and other structural features of the firm. Blanchflower et al. (2003), in a paper focused on the difficulties faced by black minorities in accessing credit, find that other disadvantaged groups like women and

other ethnic minorities do not encounter similar issues. Cavalluzzo & Cavalluzzo (1998) find that women's access to mortgage credit is comparable to that of white men, with even some benefits to women located in concentrated markets. Stefani & Vacca (2013) confirm that not only the application, but also the denial rate does not seem to differ between male- and female-run small companies when taking all relevant factors into consideration. Ongena & Popov (2016) also confirm that even if women apply less for loans, no significant difference in the approval rate emerges.

Third level: When granted credit, women-led SMEs are charged a higher interest rate. Muravyev et al. (2009) find evidence that female-run firms are less likely to obtain credit and pay a higher interest rate when the loan application is approved. Alesina et al. (2013), using a database of Italian companies, find evidence that micro-companies managed by women pay more on overdraft facilities. The higher cost of credit still holds true when controlling for the level of risk and for specific features of local credit markets. Other papers (see Table 1), on the contrary, maintain that the economic terms applied to credit are not correlated to gender.

What may be the roots of the phenomena observed?

A first explanation could be that female-led companies face worst credit access conditions for the very fact they are led by women. Due to cultural reasons and gender bias, bankers would trust these companies less than those in which the reins are in the hands of men. A slightly different, although related, explanation could be that women lack self-confidence. This, in turn, would manifest through self-selection and opt-out from loan application processes. In other words, women would not ask for loans because they are convinced they would be denied if they did so, even when this is not really the case. A third explanation looks at risk aversion, especially in financial-decision environments. Women could apply less for loans because they are less bold and aggressive in their management behaviour. A rich stream of literature investigates this perspective and finds that women tend to be more cautious and defensive in their risk-taking strategies (Powell & Ansic (1997), Byrnes et al. (1999), Barber & Odean (2001), Eckel & Grossman (2008), Croson & Gneezy (2009), Hsieh et al.

(2017)). Interestingly, Bellucci et al. (2010) find that this gender difference emerges not only when loan applicants are women, but also when loan officers are women: they tend be more prudent and restrict credit availability to new, unestablished borrowers more than their male counterparts. On the same line is the strong evidence found in microcredit, where women are more trustworthy, more prudent, and less likely to make default because of unwise money management.

Women exhibit a more prudent behavior not only in their financial decisions, but also in their entrepreneurial intentions. Dawson & Henley (2015) addresses the question whether this risk aversion attitude contributes to lower levels of female interest in business creation. By using a questionnaire survey of students in several UK and European universities, they find that start-up intention is lower among female students than male ones and this evidence appears to be associated with a gender difference in risk attitude. In other words, women show weaker entrepreneurial spirits together with lower levels of attitude to risk.

Along this line, Yacus et al. (2019) explores the key aspects of women entrepreneurship and their ability to achieve high growth. When they look at the relationship between business growth and women approaches in financing their businesses, they find that women running high-growth firms are more likely to use equity fundingwhether personal or business equity rather than debt capital. Clearly women behaviors are conditioned by the surrounding environment. (McGowan et al., 2015) state that women ambitions to develop a business as well as their propensity for entrepreneurial leadership can be significantly affected by their social and human capital, namely their business and personal network combined with their socio-demographic characteristics, skills and knowledge. Young women face a "double bind of discrimination, being perceived not gender appropriate, not properly trained, and not sufficiently experienced to launch a career as a business owner.

Finally, to answer our research question, the explanation could lie in the prevalent features of female-run companies. The need for bank financing and the riskiness of the companies perceived by lenders could be related not to the gender of the manager or the owner but to the financial features, size, and sector of the company.

In particular, descriptive evidence shows that female-run companies tend to be smaller and are concentrated in commercial and service sectors. We are able to control for these factors in our analysis so that the effect of having a woman heading a firm is detected.

Our work focuses on the frequency of loan application by firms when the decision-maker is a woman. Among the issues discussed above, this aspect is the least explored.
The novelty of our paper is the use of a dataset representative of the firm sample, rather than having a subsample of firms. This sample allows us to better control for size effects and check if the opt-out phenomenon is still discernible in large companies when the person in charge for strategic decision-making is a woman.

We also check whether the fact that a company belongs to an international group makes any difference. The effect may be controversial, and we do not have a clear expectation on the matter. On one side, the exposure to an international environment could lower any culturally inherited barrier and make the woman approach bank financing more easily. On the other side, knowing that gender bias is higher in Southern Mediterranean countries, such as Italy, could make female managers reluctant to approach the local banking system and prefer intragroup financing in order to benefit from better financing conditions.

We control as well for other features of the firms managed by women that may encourage or discourage the demand for loans by affecting the risk profile and the need for bank capital. The list of variables used as regressors, and their explanation, is listed in Table 4.
Important aspects to consider in this regard are the age of the company, the sector, the profitability, and the investments undertaken, especially for innovation in products and processes.
We control for the features of the woman leading the company, looking in particular at education level and age. We expect the culture-determined reluctance towards loan application to be negatively correlated to education. As for the age, we expect younger women to approach bank financing more similarly to men. In particular, we verify the intensity of the opt-out phenomenon by age bracket, and we explore the existence of a non-linear relation by including a squared-age term in the regression.

Finally, we include regional dummies to capture any local difference in credit offer, macroeconomic environment, and intensity of gender bias.

Table 1: Female-run SMEs and access to bank financing Literature review

	Lower application rate?	Higher denial rate?	Higher interest rate?
Cavalluzzo & Cavalluzzo (1998)	No	No	No
Coleman (2000)	Yes	No	Yes
Blanchflower et al. (2003)	n.a.	No	No
Alesina et al. (2013)	n.a.	n.a.	Yes
Muravyev et al. (2009)	n.a.	Yes	Yes
Bellucci et al. (2010)	n.a.	Yes	No
Asiedu et al. (2012)	n.a.	Yes	Yes
Cesaroni et al. (2013)	n.a.	Yes	n.a.
Stefani & Vacca (2013)	No	No	n.a.
Ongena & Popov (2016)	Yes	No	No

3 Data and Descriptive Statistics

We run the empirical analysis drawing from the sample of the Employer and Employee Survey (RIL) conducted by INAPP (previously ISFOL) in 2015. The RIL is a nationally representative sample of over 24,000 partnership and limited companies operating in the non-agricultural private sector in Italy.

The RIL contains a rich set of information about personnel organisation, industrial relations, and other workplace characteristics. It also includes the demographics of the firm's decision-maker, such as the level of education, as well as age brackets and gender. For our purpose, the RIL has the advantage of containing the characteristics of the responsible person of the firm, as well as some investment channel strategy, such as having requested credit to fund investments, the key variable of our analysis. With regard to the sample selection,

we only consider 'active' firms, meaning that we exclude wound-up firms or bankrupt firms, with a final sample of 29,789 observations.

As mentioned in the introduction, this dataset allows us to concentrate our attention not only on small and medium firms but also on large ones, so it could be interesting to see the distribution of firm size and also the age of the firms, highlighting (potential) gender differences.

The firm size is measured in terms of employees to categorise enterprises; enterprises qualify as micro, small, medium, and large as follows:

- A firm falls into the micro category if it employs fewer than 10 persons.
- A firm falls into the small category if it employs fewer than 50 persons.
- A firm falls into the medium-sized category if it employs fewer than 250 persons
- A firm falls into the large-sized category if it employs more than 250 persons

From Tables 2 and 3, we can notice that women are decision-makers above all in micro, small, or medium firms and mainly in 'young' firms. In detail, among large firms, the majority of these firms are led by men; along this line, the majority of 'aged' firms are led by men (women's share in leading firms reaches not even 1% of firms aged more than 50 years of activity).

Table 2: Firm size differentiated by gender of decision-maker

Type of firm	Man Led Firm	Woman Led Firm	Total
Micro Firm	12,467	2,710	15,177
Small Firm	8,123	1,133	9,256
Medium Firm	3,850	359	4,209
Large Firm	1,059	61	1,120
Total	25,499	4,263	29,762

Table 5 reports the descriptive statistics. Starting from the key variables on gender bias and credit demand, 17 percent of the sample firms asked for credit in 2015, with quite a

Table 3: Age categories of firms differentiated by gender of decision-maker

Age of firm	Man Led Firm	Woman Led Firm	Total
Up to 25 years	13,538	2,556	16,094
Between 25-50 years	10,692	1,549	12,241
Between 50-75 years	1,036	136	1,172
Between 75-100 years	173	20	193
Between 100-125 years	47	2	49
More than 125 years	13	0	13
Total	25,499	4,263	29,762

successful acceptance rate equal to 87 percent. As long as the manager's gender is concerned, women run a small minority of firms, only 13 percent of the businesses in the sample. Turning to the firm characteristics, such as size, sector of business, and geographical locations in Italy, it is noteworthy that the northern part of the country is predominant.

In our sample, on average, the average number of employees is 70 units, but ranges from 0 to over 140,000, while firm revenue is around 37 million euros, but climbs to a maximum of 191 trillion euros. Therefore, our analysis embraces all types of enterprises, spanning from micro to large companies. Dimensions are obviously related to the firm age, which, on average is 26 years old, suggesting that our sample reflects credit needs and attitudes of more mature businesses.

Focusing on the organisation structure, we look at whether a company belongs to a group or is independent. As expected, 85 percent of the sample is independent, while only 11 percent belongs to a national group and 3 percent to a foreign one. Regarding the sector, constructions and commerce represents the larger sector - 13 percent of the firms - while all other sectors have almost equal weight.

Moving to the main entrepreneurs' characteristics, they can be summarized as follows. The average age is quite mature: almost 30 percent of entrepreneurs in the sample are more than 60 years old, while only 6 percent is less than 40. Therefore, more than half of business managers are concentrated around middle age. Such age distribution is reflected in the education level. Seven out of 10 entrepreneurs have at least a high school diploma,

even if only three achieved a university degree or higher qualification. On the contrary, less-educated managers - i.e., middle/elementary school level - represent 20 percent of the sample.

Graphs 2 and 3 report information on credit demand and credit approval for men and women. Graph 2 gives a picture of the relationship between credit attitude and gender. It shows that female entrepreneurs tend to ask for credit much less than their male peers. The younger the age of the firm, the weaker the demand for credit is and the larger the gap between women and men is. However, after many years of experience, growing up a long credit and business history (more than 70 years), this credit gender relationship reverses its trend. Such evidence might suggest that women need time to become more confident, overcome their fears, and believe to be creditworthy.

Graph 4 reports information on the age categories and gender of the main respondents of the firms. Despite the fact that only 13 percent of the entrepreneurs in the sample are women, it is interesting to notice that the percentage of male entrepreneurs increases as they get older, while the percentage of female entrepreneurs decreases. Therefore, our picture shows that our female subsample is proportionally younger than the male one.

4 Regression Results

4.1 Empirical Model and Robustness Checks

The empirical strategy focuses on the drivers that might affect credit demand and credit approval; to do so, we have two different dependent variables: 1) credit demand for investment, expressed as a dummy variable that takes a value of 1 if there has been a loan application during the year 2015, and 0 otherwise, and 2) credit approval, a dummy variable that assumes a value of 1 if credit demand for investment has been fully approved.

$$CreditDemand_f = \beta_0 + \beta_1 female_f + \beta_2 X_f + \epsilon_f$$

$$CreditApproval_f = \theta_0 + \theta_1 female_f + \theta_2 X_f + \mu_f$$

Where f stands for the firm identifier, and individual regressors such as female and education relate to the person responsible for the firm (manager, owner, or CEO)[2]. The variable credit is equal to one if the firm asked for credit to fund an investment. Whether the credit was given (in full) was considered as credit success[3].

The explanatory variables include all variables characterising the firm, as well as variables characterising the decision-maker of the firm (as specified in the question described in the introduction). Firstly, we use the age of the firm, which should capture a different 'stability' and degree of being renowned by the local community, including the financial sector. As times goes by, firms normally expand their network such as chambers of commerce, trade partners, financial intermediaries, therefore increasing their visibility and reputation. The decision for credit is likely to be determined by how rooted the firm is in the local community. Then, the size of the firm could play another important role, firstly as larger firms could be better equipped to ask for credit and considered more solid and less risky in the financial market.

Firm size could also interact with the features of the decision-maker. In small firms, the role of the decision-maker is likely to be pivotal (as s/he is the only person to make decisions). On the other side, in medium and larger firms we expect a more diluted impact of the individual variables characterising the decision-maker. For this reason, we also include interaction terms between the gender of the firm's decision-maker and the firm size [4].

[2] For each firm, it is asked who is the responsible person (i.e., who makes the strategic decisions). The possible answers are: 1) the owner/the family owner or CEO, 2) manager chosen within the firm, or 3) manager chosen outside the firm.

[3] More in details, the questions exploited for our analysis are the following:

- In 2014, your firm made a request for credit for investment? (with a binary response Yes/No as possible answer)
- What has been the outcome of the request of credit for investment? (in this case, the interviewed has the possibility of answering "Fully approved", "Partially approved" or "Not approved")

[4] We also run other specifications of our model without firms that have opted for layoffs (defined in Italy as 'Cassa Integrazione Guadagni'), reduction in terms of number of employees, etc. without affecting final results.

The same rationale applies when we check whether firms belong to a group, making a distinction between national or foreign groups. As mentioned above, moving from an individual dimension to a collective one can lighten the weight of individuals and smooth potential cultural discrimination. At the same time, belonging to a group can offer sources of funding alternative to the domestic bank credit.

The main issue we are concerned about in this work is the role played by the fact that the person in charge for strategic decision-making is a woman. We also include the following control variables that might be distinguished between structural features of the firm (e.g., number of employees, share of female employees, age of the company, profitability, belonging to a national or international group, sector dummies, dummies for the legal status of the firm) and characteristics mainly related to the main respondent of the firm (e.g., age and education level); in Table 4, dependent and independent variables are described. Finally, we include regional dummies to capture any local difference in credit offer, macroeconomic environment, and intensity of gender bias.

In Table 6, we report results from Probit regression. We find significant evidence only for credit demand (coefficient statistically significant at 1 percent level) but no significant effect for credit approval; in particular, it appears that women-led firms have two percentage points lower probability of asking for credit than men-led ones. It is interesting to notice that it seems that younger decision-makers, those belonging to an age ranging between 15 and 39 years old, apply more compared to more experienced decision-makers; however, younger individuals might have less chance of getting the loan application approved (six percentage points lower probability).

This evidence suggests that the opt-out phenomenon is less intense in the younger decision-maker bracket than in the over-50 one. Several explanations can be offered in order to account for this different behaviour. More experienced decision makers might appear more credible by the financial institution. However, the higher denial rate associated to younger applicants may reflect either a gender bias or a riskier profile, due to the young age, of both the entrepreneur and the enterprise.

As for education, we expect the culture-determined reluctance towards loan application to be negatively correlated to education. However, education turns to be not significant in determining neither credit demand nor credit approval.

Looking at the firm characteristics, credit demand and credit approval are significantly conditioned by firms' performances. Firms with positive and larger revenues have around three percentage points higher probability of asking for credit and one per cent higher probability of being approved. Interestingly, being part of a foreign group, reduces by ten per cent the probability of applying for a loan, saying that infra-group financing is preferable in order to avoid credit rationing driven by cultural bias or higher interest rate conditions. We also perform an Ordered Probit to control for partial versus full credit approval. Results do not show significant evidence that female decision-makers are discriminated either in obtaining partial credit or full credit[5].

One of the possible concerns in our analysis is the selection issue. Obtaining credit is subsequent to having asked for it, hence, the probability of succeeding in obtaining credit has been estimated for the subsample of those firms that applied for a loan. The selection of the sample is far from random, and this feature could affect final results.
Put differently, only good debtors ask for credit. To allow for the possibility that selection issues affect the estimates, we also estimate our model using a Heckman model (the so-called Heckman Probit, taking into account the dichotomous nature of the main dependent variable). The Heckman model allows to consider the conditionality of credit approval, which could be correlated with characteristics also determining credit demand. For this reason, despite the non-linearity of the model does not require additional identification variables, we want to use a measure of credit availability in general, which does not correlate with credit approval but with credit demand only.

We use as an exclusion restriction variable a variable capturing the general availability of credit, which we proxy with the number of branches. The branch density, an index reporting

[5] We also consider the case of having as dependent variable a dummy variable taking value equal to one for credit success when the credit has been either fully or partially approved. Also in this case, results stay the same.

the concentration of banks by regions[6], is strongly significant in the selection equation (and has no predictive power in the main equation).

Results, reported in Table 7, are similar to the results not correcting for selectivity and show no evidence of selection at work. The correlation coefficient, ρ, is not significantly different from zero.

As previously pointed out, firm size could also interact with the characteristics of the decision-maker. The rationale is that the relationship between the main responsible person and the credit approach in a firm could be diluted, thus making the association between the credit decision and the responsible person less clear. Thus, in Table 8, we include as a control interaction terms between the gender of the firm decision-maker and the firm size: even if the 'female' effect does not point out any differences among firms' sizes, it is interesting to notice that the negative impact related to the gender of the decision-maker holds, and it appears that medium firms apply more for credit (almost seven percentage points higher probability than small firms) as well as large firms, which ask more for credit but less than medium ones. Along this line, aiming at capturing any differences related to how rooted the firm is in the local community, we exploit the age of the firm categorised in three main classes[7] interacting with the gender of the decision-maker.

Results are reported in Table 9: it appears that 'young' women-led firms demand for credit less compared to the ones that are probably more well known by the local community. This also supports the idea that women would tend to adopt more prudent and gradual business strategy, increasing credit demand at a later stage of firms life cycle. Finally, focusing on regional differences, from Table 10, it appears that women-led firms in Northern regions demand more for credit compared to regions belonging to the center of Italy. Moreover, firms in Southern regions seem to be less likely to apply for bank credit maybe opting for other types of funding for investments.

[6] To avoid problems of multicollinearity, we do not add regional dummies as controls, but we substitute them with macro-area dummies (North, Centre, South).

[7] We differentiate between firms below 15 years, between 15 and 30 years, and firms whose age is above 30 years.

5 Concluding Remarks

Evidence drawn in this work helps shape the policies that support women in facilitating their access to the credit market (Coleman et al., 2018). Our results show an asymmetry in the gender dimension in the credit market. A gender bias is found only in demanding credit, with women asking less for credit in their business, while we find no evidence on success rate in getting funded.

These results hold after controlling for different structural features of the firm. A gender-detrimental effect is found at a significant level only for credit demand and not for credit being approved.

From a policy standpoint, this result is of clear relevance. Women lack policies supporting them in approaching the credit market. Demanding less credit, women may risk slowing down the development of the company and loose profitable business opportunities.

One reason for which women are more distant to financial markets could be that they are less financial literate and therefore less inclined in searching for more funds outside self-financing. Another plausible reason is the difficulty in finding collaterals or the higher price they have to pay for that as suggested by Coleman (2000).

Further research is needed in this area to shape appropriate policies, which ultimately will level the playing field. Facilitating the access to the credit market seems to be the more promising policy to put into place. Once credit is demanded, the chances to get it do not differ between the two genders.

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A Appendix A

A.1 Description of Variables and Descriptive Statistics

Table 4: Description of Variables

Name of the Variable	Description of Variables
Credit Demand	The firm asked for a loan to finance an investment?
Credit Approval	The credit loan demand has been fully approved
Decision-maker characteristics	
Owner	The owner of the firm is the decision-maker
Manager outside the firm	A manager outside the firm is the decision-maker
Manager inside the firm	A manager inside the firm is the decision-maker
Female	Gender of the decision-maker of the firm
15-39 ys	Age of the decision-maker between 15-39 years
40-49 ys	Age of the decision-maker between 40-49 years
50-59 ys	Age of the decision-maker between 50-59 years
more than 60 ys	Age of the decision-maker greater than 60 years
University or higher	University (or higher) level of education of the decision-maker
High school	High school level of education of the decision-maker
Middle/Elementary school	Middle/Elementary school level of education of the decision-maker
Firm characteristics	
Firm Age	Age of the Firm
Employees	Number of Employees
Female Employees	Share of Female Employees
Revenues	Amount of revenues
Revenues(log)	Amount of revenues expressed in logarithmic form
North	The firm is located in the North of Italy

Centre	The firm is located in the Centre of Italy
South	The firm is located in the South of Italy
Person/Family major share	One person/One Family owns the major share of the firm
Cassa Integrazione	The firm opts for layoffs
Reduction Employees	The firm opts for a reduction of employees
National group	The firm belongs to a national group
Foreign group	The firm belongs to a foreign group
No group	The firm does not belong to any group

Table 5: Descriptive Statistics

	Mean	SD	Min	Max	N
Credit Demand^{+++}	0.17	0.38	0	1	20793
Credit Approval^{+++}	0.87	0.33	0	1	3568
Decision-maker characteristics^{+++}					
Female	0.13	0.34	0	1	20793
15-39 ys	0.06	0.24	0	1	20793
40-49 ys	0.25	0.44	0	1	20793
50-59 ys	0.36	0.48	0	1	20793
more than 60 ys	0.32	0.47	0	1	20793
University or higher	0.29	0.45	0	1	20793
High school	0.52	0.50	0	1	20793
Middle/Elementary school	0.19	0.39	0	1	20793
Owner	0.86	0.34	0	1	20793
Manager outside the firm	0.05	0.21	0	1	20793
Manager inside the firm	0.09	0.28	0	1	20793
Firm characteristics					
Firm Age	26.68	14.98	0	153	20793
Employees	70.34	1052.17	1	144624	20793
Female Employees	0.36	0.32	0	1	20793
Revenues	3.71e+07	1.42e+09	1	1.91e+11	20793
Revenues(log)	14.48	2.05	0	26	20793
North^{+++}	0.53	0.50	0	1	20793
Centre^{+++}	0.21	0.41	0	1	20793
South^{+++}	0.26	0.44	0	1	20793
Person/Family major share^{+++}	0.46	0.50	0	1	20788

Cassa Integrazione^{+++}[8]	0.17	0.38	0	1	17168
Reduction Employees^{+++}	0.06	0.24	0	1	20793
Does the firm belong to a group?$^{+++}$					
National group	0.11	0.32	0	1	20793
Foreign group	0.03	0.18	0	1	20793
No group	0.85	0.35	0	1	20793
REGIONS^{+++}					
Piemonte	0.07	0.25	0	1	20793
Valle D'Aosta	0.02	0.13	0	1	20793
Lombardia	0.15	0.36	0	1	20793
Trentino Alto Adige	0.04	0.21	0	1	20793
Veneto	0.09	0.29	0	1	20793
Friuli Venezia Giulia	0.04	0.21	0	1	20793
Liguria	0.04	0.19	0	1	20793
Emilia Romagna	0.08	0.27	0	1	20793
Toscana	0.07	0.25	0	1	20793
Umbria	0.03	0.18	0	1	20793
Marche	0.05	0.21	0	1	20793
Lazio	0.06	0.24	0	1	20793
Abruzzo	0.03	0.18	0	1	20793
Molise	0.02	0.13	0	1	20793
Campania	0.05	0.21	0	1	20793
Puglia	0.04	0.20	0	1	20793
Basilicata	0.02	0.15	0	1	20793
Calabria	0.02	0.16	0	1	20793
Sicilia	0.04	0.19	0	1	20793

[8] With this term, we mean layoffs.

Sardegna	0.03	0.17	0	1	20793
SECTOR TYPE^{+++}					
Mining and Energy	0.04	0.21	0	1	20793
Food and Tobacco	0.06	0.24	0	1	20793
Textile, Wood and Publishing	0.07	0.26	0	1	20793
Chemical	0.09	0.29	0	1	20793
Mechanic	0.08	0.27	0	1	20793
Manufacturing	0.06	0.24	0	1	20793
Construction	0.13	0.33	0	1	20793
Commerce	0.13	0.34	0	1	20793
Transportation	0.05	0.23	0	1	20793
Hotels and Restaurants	0.05	0.23	0	1	20793
Information and Media	0.05	0.23	0	1	20793
Financial and Insurance Services	0.04	0.19	0	1	20793
Other Services to Companies	0.07	0.26	0	1	20793
Education, Wealth and Social Services	0.06	0.23	0	1	20793

$^{+++}$ Dummy variables.

A.2 Graphs

Figure 2: Credit Demand

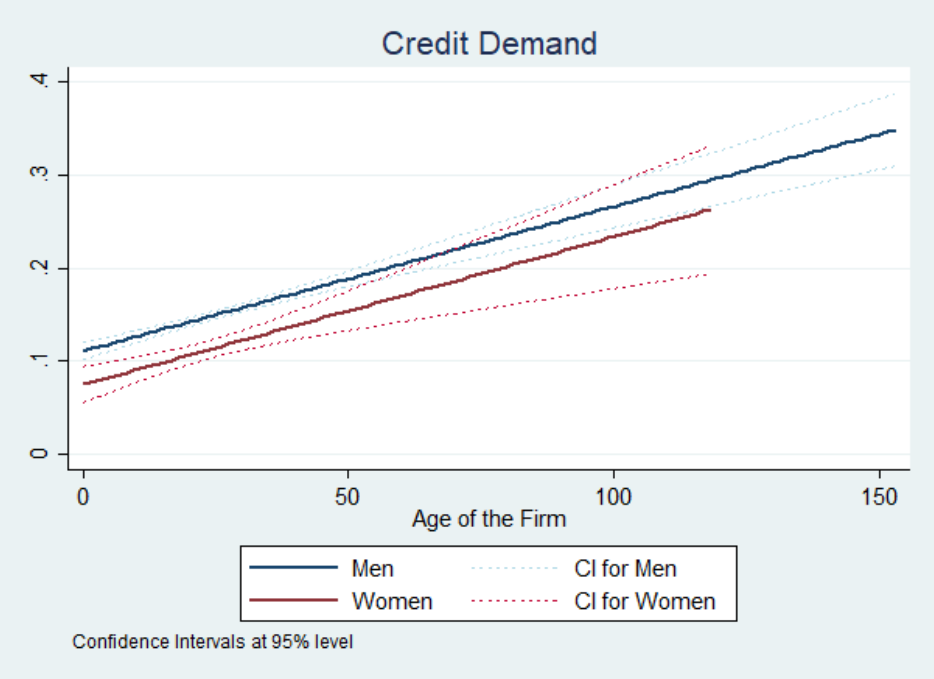


Figure 3: Credit Approval

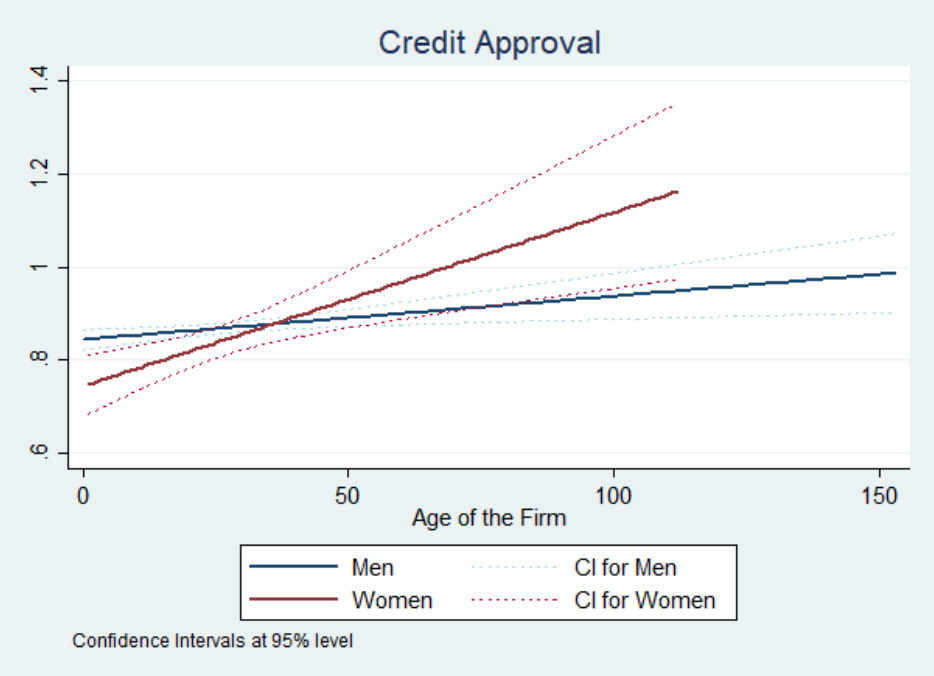
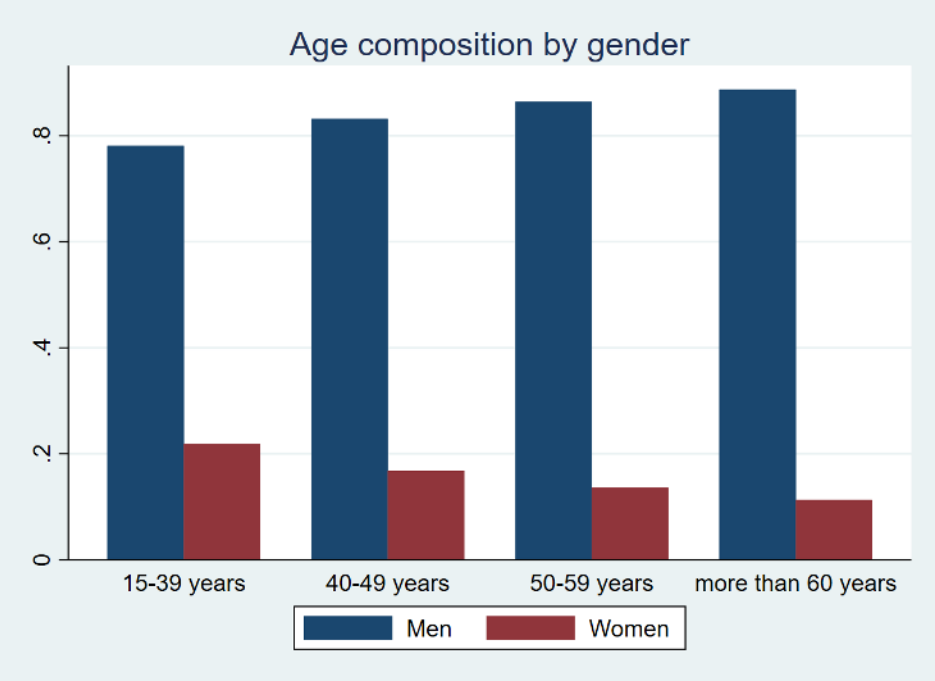


Figure 4: Age composition differentiated by gender



B Appendix B - Regression Tables

Table 6: Credit Demand and Approval

	Credit Demand	Credit Approval
Decision-maker characteristics^{+++}		
Female	-0.0204***	-0.0202
	(0.0075)	(0.0191)
15-39 ys	0.0487***	-0.0646**
	(0.0131)	(0.0288)
40-49 ys	0.0246***	-0.0023
	(0.0074)	(0.0153)
50-59 ys	0.0107*	-0.0191
	(0.0064)	(0.0140)
University or higher	-0.0054	0.0071
	(0.0084)	(0.0176)
High school	-0.0049	0.0189
	(0.0071)	(0.0152)
Owner	0.0539***	-0.0037
	(0.0083)	(0.0216)
Manager outside the firm	-0.0091	-0.0742*
	(0.0143)	(0.0420)
Firm characteristics		
Firm Age	-0.0007*	-0.0001
	(0.0004)	(0.0009)
Firm Age^2	0.0082	0.0001
	(0.0050)	(0.0102)
Share of Female Employees	-0.0437***	-0.0180
	(0.0104)	(0.0245)
Revenues(log)	0.0286***	0.0108***
	(0.0017)	(0.0035)
Does the firm belong to a group?$^{+++}$		
National group	0.0173*	0.0037
	(0.0090)	(0.0167)
Foreign group	-0.1002***	0.0041
	(0.0092)	(0.0417)
N	20793	3557
Legal Status Dummies	Yes	Yes
Regional Dummies	Yes	Yes
Industry Dummies	Yes	Yes

Probit estimation model. Marginal effects reported. Standard errors in parentheses. Baseline variables are given by: male, age of decision-maker greater than 60 ys, middle school or lower educational level of decision-maker, whether the decision-maker is a manager inside the firm, whether the firm does not belong to any group.
Molise and Valle d'Aosta represent the baseline regions for credit demand and credit approval models, respectively.
*$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
$^{+++}$ Dummy variables.

Table 7: Heckman Probit - Coefficients reported

	Credit Approval	Credit Demand
Decision-maker characteristics^{+++}		
Female	-0.0170	-0.0878***
	(0.0829)	(0.0338)
15-39 ys	-0.3396***	0.1817***
	(0.0929)	(0.0475)
40-49 ys	-0.0546	0.0964***
	(0.0721)	(0.0296)
50-59 ys	-0.0996*	0.0426
	(0.0564)	(0.0266)
University or higher	0.0467	-0.0197
	(0.0760)	(0.0358)
High school	0.0838	-0.0185
	(0.0635)	(0.0296)
Owner	-0.1628	0.2515***
	(0.1173)	(0.0439)
Manager outside the firm	-0.2613	-0.0382
	(0.1647)	(0.0633)
Firm characteristics		
Firm Age	0.0006	-0.0031*
	(0.0040)	(0.0018)
Firm Age^2	-0.0100	0.0336
	(0.0441)	(0.0209)
Share of Female Employees	0.0285	-0.1792***
	(0.1438)	(0.0428)
Revenues(log)	-0.0215	0.1194***
	(0.0577)	(0.0082)
Branches Region Index		0.0276**
		(0.0112)
North	0.2301	0.0545
	(0.1765)	(0.0479)
Centre	0.1397	0.0481
	(0.1406)	(0.0423)
Does the firm belong to a group?$^{+++}$		
National group	-0.0103	0.0713*
	(0.0751)	(0.0367)
Foreign group	0.3177	-0.5657***
	(0.2369)	(0.0801)
Legal Status Dummies	Yes	Yes
Industry Dummies	Yes	Yes
N	20778	
Censored N	17210	
Uncensored N	3568	
ρ	-0.7233	
	(0.1664)	

Coefficients reported. Standard errors in parentheses. Baseline variables are given by:
male, age of decision-maker greater than 60 ys, middle school or lower educational level of decision-maker, whether the decision-maker is a manager inside the firm, south, whether the firm does not belong to any group.
*$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
$^{+++}$ Dummy variables.

Table 8: Credit Demand and Approval by Firm Size

	Credit Demand	Credit Approval
Decision-maker characteristics^{+++}		
Female	-0.0173**	-0.0318
	(0.0084)	(0.0223)
Medium Firm	0.0693***	-0.0176
	(0.0098)	(0.0166)
Large Firm	0.0505***	-0.0205
	(0.0176)	(0.0316)
Female*Medium Firm	-0.0120	0.0486
	(0.0206)	(0.0306)
Female*Large Firm	-0.0043	-0.0217
	(0.0472)	(0.1027)
15-39 ys	0.0491***	-0.0640**
	(0.0132)	(0.0287)
40-49 ys	0.0238***	-0.0022
	(0.0074)	(0.0152)
50-59 ys	0.0099	-0.0189
	(0.0064)	(0.0138)
University or higher	-0.0060	0.0071
	(0.0084)	(0.0175)
High school	-0.0045	0.0189
	(0.0071)	(0.0150)
Owner	0.0553***	-0.0045
	(0.0085)	(0.0214)
Manager outside the firm	-0.0089	-0.0730*
	(0.0146)	(0.0421)
Firm characteristics		
Firm Age	-0.0007*	-0.0000
	(0.0004)	(0.0009)
Firm Age^2	0.0079	0.0001
	(0.0050)	(0.0101)
Share of Female Employees	-0.0459***	-0.0167
	(0.0102)	(0.0247)
Revenues(log)	0.0232***	0.0123***
	(0.0021)	(0.0036)
Does the firm belong to a group?$^{+++}$		
National group	0.0112	0.0062
	(0.0091)	(0.0168)
Foreign group	-0.1039***	0.0076
	(0.0094)	(0.0403)
N	20793	3557
Legal Status Dummies	Yes	Yes
Regional Dummies	Yes	Yes
Industry Dummies	Yes	Yes

Probit estimation model. Marginal effects reported. Standard errors in parentheses. Baseline variables are given by: male, small firm, female*small firm, age of decision-maker greater than 60 ys, middle school or lower educational level of decision-maker, whether the decision-maker is a manager inside the firm, whether the firm does not belong to any group. Valle d'Aosta represents the baseline region for credit demand and credit approval models.
*$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
$^{+++}$ Dummy variables.

Table 9: Credit Demand and Approval by Firm Age

	Credit Demand	Credit Approval
Decision-maker characteristics^{+++}		
Female	-0.0068	-0.0102
	(0.0130)	(0.0289)
15-39 ys	0.0486***	-0.0627**
	(0.0132)	(0.0287)
40-49 ys	0.0246***	-0.0034
	(0.0074)	(0.0153)
50-59 ys	0.0108*	-0.0208
	(0.0064)	(0.0139)
University or higher	-0.0054	0.0078
	(0.0084)	(0.0174)
High school	-0.0048	0.0192
	(0.0071)	(0.0150)
Owner	0.0538***	-0.0033
	(0.0085)	(0.0216)
Manager outside the firm	-0.0089	-0.0734*
	(0.0146)	(0.0421)
Firm characteristics		
Firm Age below 15ys^{+++}	-0.0013	0.0372
	(0.0169)	(0.0300)
Firm Age btw 15-30ys^{+++}	0.0028	0.0334*
	(0.0100)	(0.0198)
Female*Firm Age below 15ys^{+++}	-0.0008	-0.0282
	(0.0203)	(0.0484)
Female*Firm Age btw 15-30ys^{+++}	-0.0330**	-0.0021
	(0.0159)	(0.0408)
Firm Age	-0.0008	0.0015
	(0.0008)	(0.0017)
Firm Age^2	0.0086	-0.0090
	(0.0071)	(0.0140)
Share of Female Employees	-0.0418***	-0.0183
	(0.0102)	(0.0246)
Revenues(log)	0.0286***	0.0109***
	(0.0019)	(0.0033)
Does the firm belong to a group?$^{+++}$		
National group	0.0173**	0.0028
	(0.0092)	(0.0167)
Foreign group	-0.1001***	0.0058
	(0.0098)	(0.0404)
N	20793	3557
Legal Status Dummies	Yes	Yes
Regional Dummies	Yes	Yes
Industry Dummies	Yes	Yes

Probit estimation model. Marginal effects reported. Standard errors in parentheses. Baseline variables are given by: male, age of decision-maker greater than 60 ys, middle school or lower educational level of decision-maker, whether the decision-maker is a manager inside the firm, age of the firm above 30 ys, female*firm age above 30ys, whether the firm does not belong to any group.

Valle d'Aosta and Molise represent the baseline regions for credit demand and credit approval models, respectively.

*$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

$^{+++}$ Dummy variables.

Table 10: Credit Demand and Approval by Macro-Areas

	Credit Demand	Credit Approval
Decision-maker characteristics^{+++}		
Female	-0.0474***	-0.0061
	(0.0146)	(0.0390)
15-39 ys	0.0480***	-0.0682**
	(0.0132)	(0.0288)
40-49 ys	0.0252***	-0.0007
	(0.0074)	(0.0153)
50-59 ys	0.0113*	-0.0183
	(0.0064)	(0.0139)
University or higher	-0.0068	0.0069
	(0.0084)	(0.0175)
High school	-0.0058	0.0170
	(0.0071)	(0.0151)
Owner	0.0536***	-0.0085
	(0.0086)	(0.0213)
Manager outside the firm	-0.0098	-0.0818*
	(0.0145)	(0.0430)
Firm characteristics		
North^{+++}	0.0030	0.0300**
	(0.0070)	(0.0150)
South^{+++}	-0.0297***	-0.0543***
	(0.0078)	(0.0199)
Female*North^{+++}	0.0449*	-0.0381
	(0.0233)	(0.0548)
Female*South^{+++}	0.0319	-0.0081
	(0.0263)	(0.0542)
Firm Age	-0.0007	0.0001
	(0.0004)	(0.0009)
Firm Age^2	0.0075	-0.0006
	(0.0050)	(0.0102)
Share of Female Employees	-0.0419***	-0.0165
	(0.0102)	(0.0246)
Revenues(log)	0.0286***	0.0103***
	(0.0019)	(0.0034)
Does the firm belong to a group?$^{+++}$		
National group	0.0187**	0.0043
	(0.0093)	(0.0166)
Foreign group	-0.1015***	0.0038
	(0.0097)	(0.0412)
N	20793	3557
Legal Status Dummies	Yes	Yes
Industry Dummies	Yes	Yes

Probit estimation model. Marginal effects reported. Standard errors in parentheses. Baseline variables are given by: male, age of decision-maker greater than 60 ys, middle school or lower educational level of decision-maker, whether the decision-maker is a manager inside the firm, centre, female*centre, whether the firm does not belong to any group.
*$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
$^{+++}$ Dummy variables.

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