DO MALE AND FEMALE LOAN OFFICERS DIFFER IN SMALL BUSINESS LENDING? A REVIEW OF THE LITERATURE

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1. Introduction

It may be surprising to professional bankers, but it has only been recently recognized within the economic literature that loan origination and bank relationships with small enterprises are strongly influenced by the personality, disposition and behavior of loan officers. Information on new loan applicants and client small firms, it is now increasingly acknowledged, is in the hands of loan officers at local bank branches. For a large part this information is tacit, non-codifiable and can be fully understood only by those who are present in the socio-economic context where borrowers operate. In this view, the quality of granted loans and the accuracy of their pricing, as well as the forgone profit of denied loan applications, crucially depend on the unobservable effort spent by these loan officers on collecting and interpreting soft and hard information on actual and potential borrowers. Since effort is costly and loan officers' interests might not be aligned with those of bank's senior managers (or shareholders), the former may strategically reveal the proprietary information they collect, in order to influence the distribution of resources and power within the bank organization and/or to maximize their prospects of internal career (Milgrom and Roberts 1990; Scharfstein and Stein 2000; Milbourn et al. 2001; Agarwal and Wang 2008; Hertzberg et al. 2009). Anticipating this, banks routinely design monetary and non-monetary incentives for loan officers by trading-off the inducement to exert effort in collecting exclusive information and the deterrence of moral hazard behavior due to loan officers' informational rents.

On the top of that, a critical part of the loan officer's job is relational, meaning that he/she makes decisions through interpersonal interactions with specific borrowers often on the basis of limited information and cognitive capacity. Intuitional, emotional, behavioral and cultural factors drive loan officers' assessment of borrower's creditworthiness, complementing (sometimes, even reversing) information from financial statements (Buttner and Rosen 1988; McNamara and Bromiley 1997; Lipshitz and Shulimovitz 2007).

In fact, many of the factors that influence loan officers' behavior have proven to be gender-specific, or at least more pronounced for one gender than for the other. For example, a common finding in the economic and psychological literature is that women tend to be more risk-averse and less self-confident than men (Byrnes et al. 1999; Croson and Gneezy 2009). There is also evidence that women make slower career advancements than men and are less likely to accept jobs away from their family (Walker and Fennel 1986). On the other hand, women are typically less sensitive to competitive incentives than men (Gilligan 1982; Croson and Gneezy 2009). Men and women also seem to respond to the sex of the other party involved in the transaction in different ways (Eckel and Grossman 2001; Ben-Ner et al. 2004; Dufwenberg and Muren 2006). For such reasons, female loan officers could be inclined to use stricter criteria when deciding upon loan applications in order to avoid defaults and maximize the probability of internal career.

However, they might be less sensitive to incentive and display a greater sense of solidarity with borrowers.

In the wake of these considerations, several papers have recently focused on the lender's gender, asking whether perceptions of borrowers' creditworthiness significantly differ between male and female lenders (Wilson et al. 2007; Ravina 2008; Barasinska 2009); whether the average default rates on loans handled by female lenders are statistically lower and whether women respond to incentives differently than men (Agarwal and Wang 2008; Barasinska 2009; Beck et al. 2009); whether loan contract terms vary systematically with the loan officer's gender (Bellucci et al. 2009).

In the following pages, we provide a review of this new strand of literature. In particular, in Section 2 we examine theoretical arguments and empirical evidence on why loan officers matter, while in Section 3 we discuss reasons why female loan officers could behave differently than their male counterparts and present recent empirical evidence on whether lenders' gender is relevant for loan origination, quality (riskiness) of granted loans and their contract terms. In Section 4, we draw conclusions and some indications for future research.

2. Why loan officers matter?

Banks operate in credit markets through a network of branches where loan officers are called to make decisions upon applicants' financing requests on the basis of policy guidelines established by the bank at the central level. Regardless of the lending technologies adopted, loan officers' decisions on lending applications and contracts are of vital importance for the success of both their banks and customers.

2.1. *Theory*

2.1.1. *Information and moral hazard*

Making decisions on loans is plagued by two fundamental information asymmetries. The former originates from the borrowers who have more information on their capacity and willingness to repay the loan. For a large part this information is soft, "hard to quantify" (Berger and Udell 2002), and socially embedded. It requires an outlay of time and effort by those who are in charge of the loan approval process. In such circumstances, it would be optimal for a bank to delegate both loan origination and monitoring activities to its local loan officers who have a detailed knowledge of the particular social and economic context and a privileged access to information about local borrowers (Aghion and Tirole 1997; Dessein 2002). However, there is a second source of information asymmetry – internal to the bank organization – and it works against the formal delegation of loan decisions to local officers. The energy loan officers devote to assess a

loan applicant's quality, as well as their ability to distinguish good borrowers from bad ones, is only imperfectly self-documentable and not directly observable by supervisors (loan reviewers) at the upper layers of the bank (Garicano 2000; Milbourn et al. 2001; Novaes and Zingales 2004). Therefore, a key trade-off banks face is between information production and communication costs. Greater decision-making authority left to loan officers increases their incentive to produce information on borrowers and the likelihood that worthy credit requests will be approved, but also leads to greater information rent of loan officers and higher communication costs that must be incurred in order to limit moral hazard and adverse selection.

To address this trade-off, banks provide loan officers with monetary and non-monetary, career-related, incentives. To the extent that loan officers are the depositary of unobservable information and their efforts cannot be monitored by the principal, input- or output-based contracts can mitigate moral hazard problems and allow for an optimal allocation of risk. This possibility is explicitly investigated by two recent contributions by Agarwal and Wang (2009) and Inderst (2009) who analyze the effects of piece-rates compensation contracts on loan officers' screening and loan origination decisions.

Agarwal and Wang (2009) assume that a risk-neutral loan officer can observe the quality of loan applicants with a certain probability which increases with the unobservable effort spent on screening. Loan officer's compensation depends on the amount of loan granted but, in addition to that, defaulted loans have negative consequences on the loan officer's career prospects. For loan officers with greater career concerns, piece-rate contracts increase effort spent on collecting information and assessing loan quality. In contrast, if loan officers are not career-concerned or if monetary incentives to book loans are very high, the number of approved loans increases, but the screening effort and the average loan quality decrease. In addition, the lower the capacity to process soft information, the greater the monetary incentive needed to promote loan officer's effort in screening applicants.

Inderst (2009) assumes that loan officers have to spend effort to generate new loan applications and that they may or may not be called to use soft information at the loan-approval stage according to the lending technology adopted by the bank. The compensation scheme offered by the bank comprises a fixed part, independent of both the origination and approval of a loan, and a fee part contingent on whether a loan is approved. The bank also arranges a loan-review technology that allows it to observe the quality of the loan officer's decision with a certain probability. Consistent with Agarwal and Wang (2009), if the bank allows loan officers to use soft information, more high-powered compensation contracts lead to less strict loan standards by the bank. However, the model also suggests that if loan officers are less sensitive to competition and find it costly to search for new customers, banks should provide them with high monetary incentives at the loan-approval stage in order to induce them to exert effort at the loan-

origination stage. In this case, the bank is more likely to adopt a hard-information lending technology by depriving loan officers of any active role at the loan-approval stage.

Hertzberg et al. (2009) focus on banks' rotation policy which, by reassigning tasks among loan officers, operates as a disciplinary device and promotes reliable information disclosure about borrowers' quality. If loan officers are certain to stay in the same branch during their career, they have incentives to conceal bad news about borrowers in order to preserve their reputation of good screeners and to enhance their prospects of career advancement. In contrast, if loan officers rotate across bank branches, they anticipate that the new loan officers who are going to enter their current position will disclose all bad loans made in past since they are not responsible for them. Therefore, loan officers in charge would prefer to self-report any negative information on borrowers' repayment capacity, thus demonstrating their honesty and passive-monitoring skills. Rotation, however, may also have negative effects for the bank. First, frequent turnover may destroy valuable soft information accumulated by loan officers. It may also generate risk aversion and short-termism on the part of loan officers who respond by over-lending to well-known borrowers and investing in safe, but less profitable, short-term projects (Hirschleifer and Thakor 1992; Palley 1997; Berger and Udell 2002).

2.1.2. *Emotion, stereotypes and confidence*

Economic literature on loan officers assumes that they are fully rational and selfish agents, making decisions on the base of real, although noisy and not verifiable, information concerning the quality of applicants and their investment projects. However, the reality is that loan officers make decisions on specific individuals and not on impersonal projects or abstract entrepreneurs. Loan officers are engaged in "emotional labor": for example, they have to "suppress their feelings of sympathy for defaulters in order to collect money or seize household items for sale" (Dixon et al. 2007). This implies that behavioral, emotional, moral and cultural factors assume a crucial role in the loan-approval decisions of loan officers.

Organizational and psychological research on decision-making behavior has acknowledged the importance of non-rational factors for a long time. Intuition and emotion, for example, have been considered by many authors as a primary source of error in judgment formation (Bonabeau 2003). Others, however, have taken a more positive view on impressions and "gut feelings", by considering these factors as a valuable source of information, especially for experienced decision makers in repeated transactions (Lipshitz and Shulimovitz 2007). McNamara and Bromiley (1997) also argue that the cognitive process followed by loan officers when they make decisions on risk is influenced by their perceptions and by the context in which they operate. For example, the likelihood of loan officers overrating a borrower is positively affected by historical factors like the duration of the relation between the bank and that borrower or by the past successes achieved by

the bank branch. In addition, a fads-and-fashions effect can influence loan officers who "may prefer to lend to firms in exciting or innovative industries even if industry performance indicators suggest otherwise" (McNamara and Bromiley 1997, p. 1070).

Furthermore, loan officers are frequently called to make decisions in contexts characterized by numerous loan alternatives, very dissimilar from each other, and each described by many, possibly inconsistent cues. In such environment, loan officers have incentives to reduce cognitive processing by eliminating some of the alternatives through non-compensatory decision behavior, in which a high score on one dimension is not used to balance for low scores on other dimensions (Tversky 1972; Biggs et al 1985).

Finally, the risk assessments loan officers assign to borrowers are affected by the perceptions and stereotypes they form about the borrowers' entrepreneurial capacity and trustworthiness (Buttner and Rosen 1988; Carter et al. 2007), and by the degree of confidence they attribute to the acquired information and to their own judgment capacity (Danos et al 1989).

2.2. *Evidence*

2.2.1. *Information and moral hazard*

The existence of a trade-off between the effective selection of loan applicants and the information rent left to loan officers – that is between the reliability of the information produced in the lending relationship and the reliability of the information communicated to loan reviewers – is corroborated by many pieces of empirical evidence.

First of all, to the extent that loan officers' effort in searching for and screening of applicants is unobservable, banks are used to introducing compensation- and career-related incentives in order to align loan officers' interests with their own and to limit moral hazard problems. Agarwal and Wang (2009) investigate how incentive compensation affects small business lending at a major commercial bank in the United States. Starting from 2005, this bank introduced a new incentive compensation system for half of its loan officers, while the other half of lenders continued to be paid on a fixed wage basis. Consistent with the predictions of their model we previously described, the empirical analysis confirms that the adoption of incentive compensation has a two-sided effect: it increases loan origination but also induces loan officers to book riskier loans with a greater amount of soft information. More specifically, Agarwal and Wang find that the approval rates of the treated group of loan officers increase by 47%, the number of granted loans by 44% and the average loan size by 45%. At the same time, however, they also find that the average default rate of loans approved by lenders on incentive pay increases by 24%, while the time spent on each loan application decreases by 21%. Moreover, loan officers with greater career concerns are less likely to book a loan and the loans they book have lower default probability.

Apart from monetary incentives, banks may use rotation policy of loan officers in order to induce them to refuse new loans to unhealthy firms and not to conceal bad news on borrowers. The effect of reassigning tasks among loan officers on moral hazard in communication within the bank is the focus of the Hertzberg et al. (2009). They test three hypotheses: (1) the predictive power of internal ratings on the probability of a loan entering default in the next twelve months increases when the rotation of the loan officer assigned to the borrower becomes imminent, (2) the debt of client firms is more sensitive to the internal risk rating during high rotation quarters; (3) the average internal rating attributed to client firms is lower during low rotation quarters. Hertzberg et al. confirm all three hypotheses using data from a large multinational U.S. bank operating in Argentina. Central to the analysis are the three-year loan officer rotation rule followed by the bank and the monthly communication of risk ratings completed by the bank's loan officers.

The incentive effect of rotation policy is also confirmed by Ferri (1997) who shows, using Italian data, that the average time a loan officer spends in a branch is negatively associated with the size of the bank and therefore, with the importance of agency problems. However, loan officer turnover also leads to a loss of valuable soft information accumulated during the relationship and deters loan officers from investing resources in the production of such information. In this vein, Scott (2006), using firm-level data for a large sample of U.S. small businesses, shows that an increase in the frequency of loan officer turnover is associated with greater likelihood of the firm being turned down on its last loan application. Uchida et al. (2009), look at a sample of Japanese small businesses and find that the production of soft information increases in the lack of turnover of the loan officer serving the firm in the past three years. Finally, Liberti (2004), using the same data set as Hertzberg et al. (2009), finds that empowering loan officers in making lending decisions increases the effort they devote to screening and monitoring of borrowers, and improves the performance of the bank. However, as Udell (1989) shows, such beneficial effect of delegation tend to be counteracted by the greater resources that the parent bank devotes to loan reviewing activities.

2.2.1. *Behavioral factors*

The importance of behavioral factors for loan officers' decisions and credit access of small businesses has been verified in a number of psychological and organizational studies. Liphshitz and Shulimovitz (2007), for example, report results from in-depth interviews of fourteen loan officers at a large Israeli bank showing that credit decisions are strongly influenced by impressions, "gut feelings" and emotional intuitions. McNamara and Bromiley (1997) show that risk-rating errors made by loan officers are affected by organizational pressure for profitability and by cognitive factors, e.g. loan officer's excitement about borrower's industry prospects.

Andersson (2004) provides experimental evidence on the effects of experience on lending decisions. He investigates the information-acquisition processes used by 61 individuals with different amount of expertise with the most experienced group in the sample consisting of 23 senior loan officers. The starting point of the analysis is previous research in psychology which has documented that experts are more efficient in their search processes as they seem to acquire less but more relevant information (Camerer and Johnson, 1991; Davis, 1996). In contrast to these studies, Andersson reports that senior loan officers tend to acquire more cues across all the information categories considered. However, the junior loan officers do not behave differently from senior loan officers. In addition to that, Andersson cannot find evidence of greater consensus on risk assessment across experienced loan officers compared to novices.

Finally, there is evidence that loan officers attribute risk to loan applicants on the basis of personal perceptions and stereotypes of entrepreneurial capacity. Carter et al. (2007) show that, besides financial statements, loan officers use a wide range of criteria to form their opinion about loan applicant's creditworthiness. Danos et al. (1989) show that loan officers achieve high levels of confidence early in the lending process, and when making their final lending decision tend to ignore information which is not consistent with their early opinion and judgment. Other studies use survey-based evidence derived from loan officers' responses to questionnaires. They focus on how risk and loan approval are affected by the reliability of applicants' financial statements and the personal degree of tolerance for ambiguity of the decision-maker. The results are mixed. Johnson et al. (1983) find that the level of attestation of firms' financial statement (no attestation, compilation, review and audit) does not affect the decision to lend. Wright and Davidson (2000) show that the effect of auditor type on loan officers' risk assessment is statistically insignificant, even though the latter influences both the likelihood of loan approval (negatively) and the charged interest rate (positively). Moreover, they show that loan officers who are more tolerant to ambiguity tend to attribute a greater probability of default to loan applicants. This complements the results reported by Tsui (1993) that tolerance per se does not affect loan approval and interest rate decisions. In contrast, Bandyopadhyay and Francis (1995) find that higher levels of attestation are associated with a higher probability of approval of a loan application. Schneider and Church (2008) find that a negative judgment on the effectiveness of a firm's internal controls expressed by the auditors decreases the probability that loan officers will extend credit.

3. Why should the gender of loan officers matter?

3.1. *Gender in decision-making*

Economic and psychological literature has advanced various reasons as to why the gender of agents with decision-making power may influence the outcome of economic transactions. A non-exhaustive list includes differences between men and women with respect to risk attitude,

overconfidence, social preferences, tolerance for inequality, negotiation skills, information processing, experiencing of emotions, competitiveness, and career patterns.

3.1.1. *Risk taking and overconfidence*

There is extensive evidence from different fields of research that the gender of the decision-maker is associated with his/her risk propensity and overconfidence. Byrnes *et al.* (1999) provide a meta-analysis of 150 articles published in major psychological journals finding that women are, on average, significantly more risk averse than men. However, they also suggest that gender differences in risk-taking tend to be conditional on the particular context or task under study. Economic studies broadly confirm that females exhibit both greater risk aversion and lower overconfidence, even after controlling for other factors associated with risk attitude (Eckel and Grossman 2008b; Croson and Gneezy 2009). Most of the economic evidence is experimental, coming out of abstract gambles or financial decision games played in laboratory. Some experiments provide support for the existence of unconditional gender gap in risk preferences. Powell and Ansic (1997), for example, find that females are less risk-seeking than males irrespective of problem framing or degree of ambiguity. Similarly, Eckel and Grossman (2008a), looking at financial decision-making behavior, find that women are more risk-averse than men in both abstract and contextual designs. Others, however, suggest that risk-taking differences depend on whether lotteries are framed as gains (where women are more risk-averse than men) or losses (where the opposite holds) and that differences disappear when men and women are called to make decisions in contextual frames (Schubert et al. 1999).

Besides providing experimental evidence, research in economics and finance has also studied whether risk-preferences in actual financial decision-making differ between women and men. For instance, Jianakopolos and Bernasek (1998) utilize the Survey of Consumer Finances to analyze allocation of risky assets in portfolios held by individuals. They show that, relative to single men, single women exhibit higher relative risk aversion in financial decision-making. Sunden and Surette (1998) study observed choices made by individuals with respect to their defined contribution plans. Their findings are consistent with women being less likely to allocate retirement funds in stocks and more likely in bonds. Bernasek and Shwiff (2001) also analyze determinants of the proportion of a pension plan invested in stocks, focusing on differences between males and females. The results of their study imply that women are more conservative investors than men.

Psychologists show that the factors behind the lower risk attitude of women are gender differences in instinctive, emotional reactions to risk (Loewenstein et al. 2001), in perceptions of probability of adverse events (Lerner et al. 2003) and especially in the degree of confidence in the rightness and success of their own decisions. For example, Estes and Hosseini (1988) provide

experimental evidence on the determinants of confidence with respect to investment-related tasks among security analysts, institutional investors, shareholders and general business people. They conclude that women are significantly less confident in their investment decisions than men even after controlling for other relevant variables such as experience and investment amount. Lundberg et al. (1994) conduct an experimental study by asking students to identify their confidence in answers they give to test questions. Thus, the authors focus on a specific rather than general context. Confirming the existence of differential degree of overconfidence in men and women, the authors conclude that females do not necessarily lack confidence but it is males who have too much confidence, especially in the cases when wrong. Rather than following the experimental approach, Barber and Odean (2001) focus on actual trading made by individual investors and broadly confirm that women are less overconfident than men. The authors document that men trade more often than women and the increased trading volume leads to lower net returns.

3.1.2. *Social preference and gender pairing*

Another major reason of gender bias in decision-making is that men and women often attach different weight to the payoffs of others in their own preferences. As put by Croson and Gneezy (2009), women are often considered to be more "other-regarding" than men. They also differ from men with respect to generosity and willingness to help. Eagly and Crowley (1986), for example, compile a meta-analytic study of more than 170 published articles and conclude that males end up helping others more frequently than females. The authors also hint at the role of gender-pairing: men are significantly more likely to help women than other men, while women are equally likely to help. Salminen and Glad (1992) also focus on gender pairing in helping by studying whether men and women are more likely to help person of the opposite sex but find no support for this claim.

Gender differences in generosity are often the focus of experimental economic analysis. Eckel and Grossman (1998) study the oft-mentioned claim that women are more socially-oriented or selfless than men in a dictator game, in which players are called to propose a split of a given sum of money with another person who cannot refuse the proposal. The authors consistently find that, in a setting of anonymity, women are willing to give a larger share of their own resources to others. Dufwenberg and Muren (2006) also find that females give slightly more than males. But, interestingly, they show that the donations are lower and less frequent when they are made publicly and that men donate from 27% to 50% more to women than to other men. Eckel and Grossman (2001) study giving behavior in an ultimatum game with face-to-face contacts, where the proposer receives a positive payoff only if the responder accepts the proposal. Once again, they find that women's proposals are more generous and that women are

satisfied with the initial proposal more often. They also find that men accept more frequently proposals coming from women than from other men (chivalry effects), while women almost never reject the proposal of other women. The hypothesis that women exhibit greater generosity and solidarity is rejected by Ben-Ner et al. (2004). They find that women tend to give slightly less than men and that the difference is driven by the cases in which women are asked to give to other women.

Finally another interesting piece of evidence on gender differences in social loafing is provided by Karau and Williams (1993). They perform a meta-analysis of 78 studies which analyze the tendency for individuals to exhibit less effort when working collectively. Their results suggest that females might be less likely to free-ride, and hence, more likely to work for the benefit of the group.

3.1.3. *Negotiation skills*

If females and males follow different bargaining tactics and norms or have different propensity to initiate negotiations, the bargaining outcome could be affected by gender. A meta-analytic exploration of more than 20 published articles collected by Stuhlmacher and Walters (1999) indeed finds that on average men tend to negotiate significantly better outcomes than women. By conducting interviews with more than 200 students about negotiation strategies, Kaman and Hartel (1994) confirm that males and females follow different bargaining styles, with men being more focused on active strategies like starting a negotiation to get the highest salary possible or making a higher counter offer in response to the initial offer made by the company, while women being more likely to rely on traditional self-promotion like emphasizing the relevance of their own education for the required task or their willingness to be engaged in different tasks. Gerhart and Rynes (1991) analyze salary negotiations in a sample of graduating students and show that even though men and women have similar propensity to bargain for high salary, the outcome of such bargaining, i.e. the salary that the applicant eventually accepts, varies substantially with gender. A possible explanation advanced by the authors is that men use more effective bargaining tactics or use the same tactics more skillfully. In contrast, Small et al. (2007) confirm the presence of gender-differences in negotiation propensity despite the lack of differences in actual negotiation performance. The main driver of the observed asymmetry seems to be framing: gender differences exist in situations framed as opportunities for negotiation on compensations but not in situations framed as opportunities to ask for more money. The finding is consistent with women being more likely to follow a norm of politeness.

3.1.4. *Information acquisition and reporting*

Gender can interact with decision-making if men and women acquire and process information in different ways, forming different judgment with respect to the same issue. Brown et al. (1980) explore gender-based differentials in cognitive activity by focusing on qualitative differences in perception and memory. Their study shows that, consistent with gender differences in information processing, masculine words are better recalled by males, whereas feminine words by females. Sex differences in information processing strategies are also documented by Darley and Smith (1995). In an experimental setup, they ask men and women to listen to subjective and objective advertising claims for either a low-risk or moderate-risk product and rate their perceptions about the claims in terms of perceived credibility and purchase intention. They find that women tend to be more comprehensive information processors who consider both objective and subjective aspects giving them different importance according to the product riskiness. In contrast men are more selective and tend to focus on single cues regardless of the risk attached to the product. In a study of the association between gender-driven differences in information processing and performance of accounting students, Chung and Monroe (1998) find that females are more inclined to rate disconfirming information as important. On the contrary, males are more likely to rate confirming information as important. More related to the tasks performed by a typical loan officer, Graham et al. (2002) explain gender differences in investment strategies by differences in information-processing styles: they suggest that males might be more likely to focus on expected returns, while women would be more likely to incorporate the risk dimension along with other secondary information. Interested in the use of accounting information, Smith (1999) also suggests that gender is important characteristic with an impact on accounting-based decisions. Finally, Powell and Ansic (1997) show experimentally that women tend to adopt strategies which avoid the worst-case alternative, while men are significantly more likely to focus on the best-case alternative.

Gender differences are also found in the propensity to misreport. For example, Karlan and Zinman (2008) conduct a survey on borrowing behavior of first-time applicants for expensive consumer credit in South Africa, showing that nearly half of the respondents underreport their recent borrowing activity, but women tend to "cheat about borrowing" more frequently than men. Interestingly to our end, they also show that the lying incentives of respondents depend on the surveyor's gender, with female borrowers interviewed by men being most likely to misreport.

3.1.5. *Stereotypes and perceptions*

Recent research in psychology and management has documented that males and females form different stereotypes of successful entrepreneurs or managers and perceive financial matters in different ways. Gupta et al. (2009) study whether entrepreneurs are perceived to have mainly masculine or feminine traits and show that both genders ascribe more masculine characteristics

to the entrepreneurial image, even if women are more likely to attribute females' traits to the entrepreneur ideal-type. Similarly, Duehr and Bono (2006), find that male students rarely consider manager characteristics as feminine, and this stereotype is rather persistent over time. More generally, Miller and Budd (1999) provide evidence that occupational sex-role stereotypes can be detected at a very early age and that male students are more likely to form such stereotypes. A study by Kray et al. (2001) shows that women are more concerned about stereotypes and more susceptible to stereotype threats, especially if they perceive a task as diagnostic of their ability.

3.1.6. *Competitiveness*

There is robust evidence that men and women behave differently under competition and that they have different sensitivity to competitive incentives. Gneezy et al. (2003) run a series of experiments and conclude that women might be less effective than men in certain competitive environments. In particular, the authors document that women are not less effective than men in non-competitive or in single-sex contexts but tend to exhibit inferior performance when facing competition by males. Shurkhov (2009), however, suggests that it is not competition per se that affects the gender gap in performance but time pressure. The author finds that, if time pressure is reduced, women can outperform men even in competitive environments by increasing both the quality and quantity of their output, while men tend to focus on quantity at the expense of quality. Niederle and Vesterlund (2007) hint that any observed performance under competition might be due to differential willingness to compete. In their study, the authors show that men are more likely to select competitive environment even though their performance in such environment is not superior. Overall, the authors conclude that women tend to shy away from competition. A similar perspective emerges in the meta-analytic study of Karau and Williams (1993). As the authors argue, men are often described in the literature as more likely to follow competitive concerns, while women are associated with cooperative ones.

3.1.7. *Career patterns and discrimination*

Different career patterns and societal roles between men and women or concerns with gender-based discrimination within organizations and in the external labor market could make decisions susceptible to the decision-maker's gender. For example, following the classical Becker's (1985) argument, the greater responsibility of women for child care and housework could have implications for their occupational/career choices and earnings. Studies in organizational studies also indicate that gender is an important criterion for task and/or authority assignment within companies. Walker and Fennell (1986), reviewing studies on gender-based role differentiation, report that men are more likely to be assigned to more instrumental and influential tasks, while women are more often in passive and cooperative roles. Wright et al. (1995) study various

determinants of the gender gap in workplace authority in seven countries. The analysis reveals that a gender gap in authority exists in each of the countries: women are less likely to be in the formal authority hierarchy, to have sanctioning power or to participate in organizational policy decisions. Research in economics has also provided extensive evidence of gender-based discrimination in the labor markets. As Darity and Mason (1998) state in their review of the literature, one of the major causes of gender disparity in the American economy is discriminatory treatment of women in the labor market.

3.2. *Gender in lending decisions*

Applied to the context of lending decisions, the factors outlined in the previous section make it clear why the gender of loan officers matters for originating and shaping a loan contract.

If male loan officers exhibit higher risk tolerance and/or overconfidence, projects of similar risk could be funded by them, while rejected by their female colleagues. Alternatively, female lenders could extend credit but only if stricter contract terms and requirements are ensured. In contrast, social preferences may have ambiguous effect on female and male decision-making in the lending context. If female loan officers have more solidarity with borrowers they could apply less stringent loan-approval criteria than male loan officers. However, social preferences and gender-pairing between loan officer and borrower could significantly loosen or tighten decisions on loan approval and contract terms depending on whether solidarity, chivalry or envy sentiments prevail. In addition, loan contract terms depend on the negotiation ability of the two transacting parties and, as we saw, this ability might be gender-specific. Furthermore, the loan officer's gender may be a crucial element in lending transactions if male and female lenders search for information and process the information they acquire in different ways. For example, to the extent that women make decisions taking into account both formal and informal pieces of information, female loan officers might be more inclined to process soft information and decide upon small, informationally opaque borrowers. Alternatively, female loan officers could reach better credit decisions if they are superior at identifying crucial cues or they have a tendency to assess borrowers' creditworthiness more cautiously. In addition, male and female loan officers can make biased decisions on loan applications presented by male and female entrepreneurs depending on the stereotype of successful businessperson they hold. Finally, gender differences in propensity to compete and career concerns could make the severity of the agency problems between the bank and its loan officers, as well as the appropriate design of internal incentive structures, gender-specific.

Given the pervasiveness and importance of these factors in the loan decision-making process, it is rather surprising that the gender of loan officers has long been overlooked in the existing banking literature. Apart from studies that introduce the gender of the loan officer as a

control variable in more general regression models of lending behavior, papers which explicitly focus on how and why loan officer's gender affects the loan approval strategy and the terms of the loan contract are rare. For the sake of our presentation, we classify the existing evidence along the lines of our theoretical discussion on why loan officer's gender matters. Therefore, the findings of some papers will be discussed in different subsections according to the specific gender factor they analyze. For studies that simply control for the loan officer's gender, we make an attempt to infer the factors consistent with the evidence presented, even beyond what the authors suggest. Table 1 summarizes research objectives, variables, methodology and results of the empirical studies focusing on the gender differences in making lending decisions**.**

[Insert Table 1]

3.2.1. *Risk taking, overconfidence and information processing*

Three recent papers focus on whether gender-based differences in risk taking, overconfidence and information processing are associated with the outcome of the lending process in terms of loan performance and contract terms.

Beck et al. (2009) study how the gender of the loan officer who approves and services a loan application affects the subsequent loan performance which is defined as the probability that the loan will be in arrears for more than 30 days. The authors use a proprietary dataset of loans granted by a microcredit lender in Albania over the period 1996-2006. The overall conclusion of the study is that loans screened and monitored by female lenders tend to perform better, being 4.5% less likely to become problematic. The authors advance several explanations for this pattern. One of them is the existence of different degrees of risk-aversion and/or overconfidence between lenders of different gender. If female lenders are less willing to take risk, they should be more restrictive in their approval decisions. To address this hypothesis, the authors analyze how loans granted by male and female lenders differ in terms of ex-ante observable risk measures. In contrast to the risk-aversion hypothesis, they find that, if anything, female lenders are associated with more risky borrowers rather than less risky ones, and they do not seem to reject loan applicants more often compared to their male colleagues.

A second explanation for the superior performance of the loans underwritten by female lenders investigated by the authors is that female lenders might have better hard-information processing skills which differ systematically from those of their male counterparts. To address this conjecture, Beck et al. focus on the rejection/approval decisions by male and female lenders and show that, based on observable factors, female loan officers do not seem to use different screening strategies. This insight is also formally confirmed by an econometric test (Chow test) for equality of the coefficients in the two sub-samples (male loan officers vs. female loan officers)

that does not indicate any statistically significant difference. In sum, Beck et al. do not find support for the notion that female lenders are more risk-averse or possess different information processing skills with respect to information based on observable borrower features. However, the authors suggest that female loan officers might have better information processing skills with respect to unobservable, soft-information factors pertaining to the character and nature of the loan applicant.

Rather than focusing on ex-post loan performance, Bellucci et al. (2009) study the relevance of loan officer's gender for the shape of the loan contract in terms of interest rate, collateral and credit availability. The authors use a proprietary dataset of credit lines granted to more than 6000 sole proprietorships by a major Italian bank during the years 2004-2006 to analyze whether and how price of credit, incidence of credit secured through collateral and probability that a borrower exceeds the credit limit allowed by the bank using the costly option to overdraw funds vary with loan officers' gender. The underlying motivation is that if female lenders were more risk averse than male lenders, loans approved by the former should be characterized by stricter contract terms. Controlling for a large number of borrower characteristics, nature of the bank-borrower relationship and conditions in the local credit market, the authors show that the gender of loan officer does not affect the loan contract terms for the average borrower. Bellucci et al. (2009) also provide insights as to whether male and female lenders process information differently in different information environments. The authors use the length of the bank-borrower relationship as a proxy for the amount of information available about the loan applicant. In particular, borrowers with longer relationship with the bank should be characterized by lower opacity to the lender. The analysis reveals that the association between the gender of loan officer and the shape of the loan contract depends on the information environment in which the transaction takes place. For new and un-established borrowers, the probability of overdrawing costly funds when all loan officers at the lending branch are women is almost 15% higher than when all loan officers are men. The gender gap disappears for borrowers with longer relationships with the bank. This finding is consistent with the idea that men and women behave differently in different information contexts: the gender effect is important when a borrower is less transparent but disappears once sufficient information is accumulated over time. It is in the former case, when female lenders tighten credit terms.

Rather than analyzing the behavior of trained professionals such as bank loan officers, Barasinska (2009) investigates the importance of lender's gender in person-to-person lending transactions. The author uses a sample of more than 37,000 bids for loans made by more than 4,200 lenders on more than 2,400 applications in the period March, 2007 to October, 2009 on the German web-platform Smava.de. She advances two hypotheses based on risk preferences, over-confidence and information-processing. The overconfidence hypothesis states that female lenders

are more likely to finance less risky loans. The prudence hypothesis argues that, due to their superior information-processing skills, females will form loan portfolios which over-perform over time. The author studies the probability that a female lender will finance at least part of a loan and shows that female lenders are more likely to participate in loans with lower interest rates and longer maturity. The only borrower-related characteristic which influences the incidence of female financing is borrower risk. However, in contrast to the overconfidence argument, Barasinska finds that female lenders are more likely to take part in loans requested by riskier borrowers.

A major drawback of the previous studies is that they cannot directly measures the information-processing skills and strategies of the decision-makers. The studies by Andersson (2004) and Schneider and Church (2008) try to address this issue by directly measuring the strategies and processes followed by decision-makers. Although they do not focus on the existence of gender-based differences, both studies find no evidence of gender gap in the information acquisition processes. Andersson finds that on-the-job experience influences neither male nor female loan officers, while Schneider and Church find that the impact of negative internal auditing reports on loan officers' risk assessment of applicants is the same regardless of their gender.

In summary, the extant literature presents evidence on gender differentials in risk-taking, overconfidence and information processing which is at best inconclusive. Papers which study outcomes of the lending process provide evidence that women might be more likely to fund riskier borrowers but the contract terms are not systematically different between male and female lenders. Studies which focus on information acquisition and behavior of men and women in different information environments show that information-processing does not differ by gender when the context is constant but the outcome of the transaction might depend on the information context.

3.2.2. *Stereotypes and perceptions*

Buttner and Rosen (1988) conduct a survey of 106 loan officers (60 male and 46 female) to investigate if they perceive men and women applicants differently along various dimensions believed to characterize successful entrepreneurs. In particular, the authors focus on leadership, autonomy, propensity to take risks, readiness for change, endurance, lack of emotionalism, low need for support, low conformity, and persuasiveness. The authors first document that men are generally seen as closer to successful entrepreneurs than women. Men are ranked higher than women along 6 of the characteristics. The findings of the study also reveal that male loan officers perceive a larger gap between the attributes which describe successful entrepreneurs and the attributes of women. Compared to their male colleagues, female loan officers are more likely to

rate women higher along attributes such as autonomy, endurance and low need for support. The characteristic of successful entrepreneurs that truly distinguishes the perceptions of male lenders from those of their female counterparts appears to be leadership. Thus, the evidence supports the existence of differential perceptions and/or stereotypes by male and female lenders. Buttner and Rosen, however, do not study if these perceptions affect actual lending behavior of the officers.

An attempt to fill this void is made by Carter et al. (2007) who, by focusing exclusively on the criteria and processes followed by male and female loan officers in their lending decisions, complement the analysis of Buttner and Rosen (1988). Using a sample of 35 loan officers from a major British bank, Carter et al. show that the relative importance of certain assessment criteria used by the loan officers in their decision-making processes is gender specific. In particular 3 out of 18 loan assessment criteria were found to be significantly different at the 95% confidence level across male and female loan officers and additional 5 criteria were found to be different across the two groups at the 90% confidence level. The former set includes criteria such as marital status, need for a personal meeting and borrower commitment. For instance, female loan officers are more likely to consider the marital status of the applicants or the need to meet them personally, while male loan officers are more likely to consider the commitment of the borrower. The latter set of criteria reveals that male lenders are more likely to discuss positive comments about the application and to consider the past experience, education and finances of the borrowers, Conversely, female loan officers are more likely to discuss the need for more information about the applicant. Besides gender-based differences in lending criteria, the authors also document gender gap with respect to the lending processes the loan officers focus on. The authors show that male and female loan officers differ along 7 out of 13 elements of the lending process. For instance, male lenders are more likely to focus on the general lending process and their own "gut instinct" about the transaction, while female lenders are more likely to consider the general terms of the contract, the business plan of the applicant, and the size of the request. Overall, the analysis presented by Carter et al. shows that male and female loan officers use different criteria in their lending decisions and focus on different aspects of the lending process.

In a related study which investigates differences in perceptions between male and female lenders, Wilson et al. (2007) focus on the constructs – defined as basic contrasts/distinctions between members of two groups – used by male and female bank loan officers when deciding upon female and male loan applicants. Using a survey of 35 loan officers (19 male and 16 female) from a major bank in UK, the authors hypothesize and test three different gender-based patterns in perceptions: 1) no gender difference, 2) unsystematic differences, and 3) systematic differences. In most of their analysis, the authors show either no gender difference or no systematic gender difference. Hence, the study concludes that female lenders are as likely as their male colleagues to draw gender distinctions.

Finally, interesting insights into how feelings and emotions drive female and male lenders' decisions are offered by Ravina (2008). In this study, the author uses lending which takes place on the specialized web-site Prosper.com in the United States in order to investigate whether male or female lenders are more susceptible to their perceptions by analyzing who lends to more beautiful borrowers or borrowers who visually appear more creditworthy. Consistent with female lenders being more susceptible to emotions, the author shows that women are more likely to lend to beautiful borrowers or to creditworthy-appearing ones. However, once controls for income and other borrower characteristics are introduced, the importance of lender's gender loses its significance. Moreover, the effect seems to be driven by solidarity for both male and female lenders as the indicator variable for cases where borrower and lender have the same gender is highly significant. Overall, it seems that solidarity affects both men and women in their decisions to grant credit to the, ex-post worse, beautiful borrowers. Women do not seem to be more sensitive to their perceptions, once all factors affecting a lending decision are considered. Furthermore, in line with the lack of gender gap in perceptions, the lending behavior of females towards black borrowers does not seem to differ substantially too.

In sum, the early evidence on the formation of stereotypes and perceptions of male and female lenders is consistent with the existence of gender-based gap along these dimensions. The more recent studies however, fail to detect systematic gender differences in this area. Hence, further research is needed in order to reach a conclusion.

3.2.3. *Social preference and gender pairing*

The importance of the social preferences of lenders and the possibility that gender-pairing effects are driving the decisions of male and female loan officers have been treated in a number of papers.

Partial evidence comes from Alesina et al. (2008) who focus on the question of gender discrimination in access to credit. By using a large dataset on overdraft facilities to sole proprietorship firms in Italy, they show that, all else equal, female entrepreneurs pay higher interest rate than their male counterparts. Since male and female entrepreneurs do not seem to differ significantly in terms of risk, the authors' conjecture is that the discrimination against females is taste-based. Even though Alesina et al. do not have information on the gender of the loan officer handling a particular loan, they do recognize its importance. The authors suggest that, if what they find is indeed taste-based discrimination, banks with female representatives on their boards might be more likely to make efforts to avoid it. The underlying reasoning is that banks with female board members might be more sensitive to the issue of discrimination and understand the concerns of female borrowers better. Reported regression results suggest that interest rates charged by banks with at least one female director tend to be lower on average.

However, the authors do not find evidence that the presence of female directors decreases gender-discrimination effects as the beneficial effect of women on the board of the bank does not occur predominantly to female borrowers.

A drawback in the analysis conducted by Alesina et al., at least with respect to gender-pairing, is that the authors do not have information on the loan officer who develops the contract. Bellucci et al. (2009) alleviate this issue by using the proportion of female lenders at each bank branch and sub-samples analysis of loans granted at branches with male only and female only lenders. The authors study the importance of gender pairing not only for price of credit but also for other contract terms such as collateral requirements and credit limit. Consistent with gender-specific differences in social preferences and gender-pairing – chivalry and solidarity effects in particular – female lenders tend to charge male borrowers lower interest rates but request collateral from female borrowers less often.

Beck et al. (2009) further improve on Alesina et al. (2009) and Bellucci et al. (2009) by incorporating information on the gender of the very loan officer who approves and monitors a loan. The analysis of Beck et al. (2009), however, complements that in the other two studies by focusing on loan performance rather than terms of the contract. In particular, Beck et al. find that the positive effect on loan performance associated with female loan officers previously discussed is particularly pronounced when the borrower is also female. The authors suggest cultural affinity as possible explanation, i.e. individuals of same gender could be better at understanding each other.

Further evidence on the role of gender-pairing in person-to-person lending is presented by Ravina (2008). The author advances the importance of gender-pairing in lending because, as she puts it, "similarity breeds trust". In other words, lenders of the same gender as the borrowers could feel more solidarity with them and be more likely to fund these loans or to grant larger amounts. The evidence on gender-based similarity, however, does not fully support this argument. On the one hand, similarity seems to affect neither bid incidence nor offered amount because the coefficient on indicator for same gender is negative but statistically insignificant. A negative coefficient would be consistent with presence of chivalry rather than solidarity among lenders and borrowers of the same gender. On the other hand, the author finds contrasting results when she studies the proportion of lenders with the same gender as the borrower. In this case, gender-based similarity increases the probability that a loan is funded and the percent of funding but does not affect the interest rate.

Also looking at person-to-person lending on the web, Barasinska (2009) fails to detect any evidence of gender pairing effects as the probability of female participation among the lenders who respond to a borrowing bid is independent of the bidder's gender.

Overall, the extant literature on gender-pairing and social preferences provides some evidence that these factors could drive the shape of loan contracts and their performance ex-post. The results of studies based on bank lending seem to be most consistent with gender-based solidarity and cultural affinity, while the evidence from interpersonal lending is mixed.

3.2.4. *Negotiation skills*

Despite its importance, the impact which negotiation skills and strategies have in the lending context has remained largely unexplored. An interesting exception is Black et al. (2000) who investigate mortgage lending practices by using proprietary data from a major lending institution in the United States. The focus of their analysis falls on the use of overages – the difference between the price at which a loan closes and the minimum price acceptable to the lending organization. The authors hypothesize that the gender of the loan officer might be important determinant of the amount of overage as it could be related to the bargaining skills of the decision-maker. Consistent with male loan officers being tougher negotiators and/or possessing better negotiation skills, the authors conjecture that male lenders should impose higher overages than their female colleagues. However, the reported results are mixed and depend on the loan purpose. When a mortgage is used by the borrower to finance the purchase of a new estate, male loan officers tend to charge significantly higher overages. In contrast to this case, male and female lenders close contracts at similar overage amounts when the loans are used for the refinancing of existing mortgages.

Overall, the evidence on gender-based differences in terms of negotiation skills and strategies in the context of bank lending is rather limited. Hence, more research in this area should enable us to better understand the role and importance of this factor.

3.2.5. *Career concerns and competitiveness*

Finally, Agarwal and Wang (2009) provide some interesting results on gender gaps in career concerns and differential degrees of competitiveness between male and female lenders. As previously discussed, the authors investigate how incentive compensation and competition affect small business lending at a major commercial bank in the United States. In passing, the authors provide evidence which suggests that the effect of the new scheme is gender-dependent. Consistent with the idea that men respond more to competitive incentives, the authors show that the new incentive scheme almost doubles the gender gap in approval rates – from almost 4% difference in approval rates to almost 11% difference – but also increases the default rates of loans approved by female lenders over proportionally – from 0.8% differential between male and female lenders to negative 0.05%. As an explanation for the documented gender effect, the authors argue that female loan officers are more likely to have distorted incentives because they

have shorter career spans and less career concerns. Thus, they are more likely to approve riskier loans. Despite not being directly acknowledged by the authors, this finding could also be consistent with the notion that females are less effective than their male colleagues in competitive environments and thus competition has a detrimental effect to their performance.

Once again, further research along this dimension is needed if one wants to judge the importance of factors such as competition and career concerns more thoroughly.

4. Conclusion

Loan officers are not only the conduit of bank policies and operations in credit markets but also the crux between entrepreneurs, small businesses and lending institutions. They are at the heart of two important problems of information asymmetry pertinent to banking: the asymmetric information between banks and loan applicants and the moral hazard within the banking organization itself. Until recently, the economic literature considered loan officers as rational agents with unlimited information-processing capacity. In this review, we provide a brief overview of a more recent stream of research which recognizes that lending decisions could be affected by behavior, character and even feelings or emotions of loan officers. Our focus falls on gender-based factors which have been show to have the potential to affect the tasks performed by loan officers. Different degrees of risk-aversion and overconfidence between man and women result in male and female loan officers reaching different lending decisions. Social preferences and gender-pairing also lead to gender-specific outcomes of lending. Finally, negotiation skills, stereotypes and perceptions, career concerns and discrimination have been shown to vary significantly with gender. The extant literature for most of these factors is scarce and thus they remain important topics for future research. Furthermore, most of the recent studies which have addressed the importance of loan officer's gender using real data on large samples could only provide indirect insights into their behavior as characteristics such as degree of overconfidence or career concerns are not directly observable. Studies which try to directly measure factors such as perceptions and stereotypes are either based on small samples or do not address all aspects of the outcome of the lending process. Moreover, often the observed pattern in the data is consistent with more than one explanation and differentiating between the alternatives remains an hard open question.

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TABLE 1. LOAN OFFICERS' GENDER: A SUMMARY OF THE AVAILABLE EVIDENCE

Authors	*Research objective and variables*	*Methodology*	*Factors driving gender differences*	*Gender differences in lending decisions*
Agarwal and Wang (2009)	Loan approval rates Loan performance – default rates	Logit model	Career concerns (less)	F > M
Alesina, Lotti and Mistrulli (2008)	Loan contract terms – interest rate	Ordinary Least Squares (OLS) Panel random-effects model	Gender-pairing	F > M
Barasinska (2009)	Loan funding – participation by female lenders Loan performance	Logit model	Risk /overconfidence Prudence	F < M F > M
Bellucci, Borisov and Zazzaro (2009)	Loan contract terms – interest rate, collateral, credit availability	Ordinary Least Squares (OLS) Probit model	Risk/overconfidence Gender-pairing	F > M F ≥ M
Beck, Behr and Guettler (2009)	Loan performance – arrear probability	Probit model	Risk/overconfidence Career concerns Gender-pairing	F < M F < M F < M
Black, Boehm and DeGennaro (2000)	Loan contract terms – overcharge	Tobit model	Bargaining skills	F < M
Buttner and Rosen (1988)	Loan officers' perceptions – similarity between man/women and successful entrepreneurs	Interviews/t-tests	Stereotypes/perceptions	F < M
Carter, Shaw, Lam and Wilson (2007)	Loan assessment criteria and application processes	Verbal protocol/χ^2-tests	Information acquisition/decision criteria	F ≠ M
Ravina (2008)	Loan funding – participation by female lender Loan contract terms – interest rate	Probit model Tobit model	Gender-pairing Perception	F > M F > M
Wilson, Carter, Tagg, Shaw and Lam (2007)	Loan officers' perceptions – constructs held for men/women	Repertory grid/t-tests	Stereotypes/perceptions	F ≠ M