Gendered Access to Finance: The Role of Team Formation, Idea Quality, and Implementation Constraints in Business Evaluations

Vojtech Bartos (University of Milan)

Silvia Castro (LMU Munich)

Kristina Czura (University of Groningen)

Timm Opitz (Max Planck Institute for Innovation and Competition)

Discussion Paper No. 473

December 06, 2023

Gendered Access to Finance:
The Role of Team Formation, Idea Quality, and Implementation Constraints in Business Evaluations

Vojtěch Bartoš[1]   Silvia Castro[2]   Kristina Czura[3]   Timm Opitz[2,4]

[1]Department of Economics, Management, and Quantitative Methods, University of Milan, Italy

[2]Department of Economics, Ludwig-Maximilians-Universität (LMU), Munich, Germany

[3]Department of Economics, Econometrics and Finance, University of Groningen, The Netherlands

[4]Max Planck Institute for Innovation and Competition, Munich, Germany

October 2023

Abstract

We analyze gender discrimination in entrepreneurship finance. Access to finance is crucial for entrepreneurial success, yet constraints for women are particularly pronounced. We structurally unpack whether loan officers evaluate business ideas and implementation constraints differently for male and female entrepreneurs, both as individual entrepreneurs or in entrepreneurial teams. In a lab-in-the-field experiment with Ugandan loan officers, we document gender discrimination of individual female entrepreneurs, but no gender bias in the evaluation of entrepreneurial teams. Our results suggest that the observed bias is not driven by animus against female entrepreneurs but rather by differential beliefs about women's entrepreneurial ability or implementation constraints in running a business. Policies aimed at team creation for start-up enterprises may have an additional benefit of equalizing access to finance and ultimately stimulating growth.

1 Introduction

Access to finance plays a crucial role in unleashing the potential of entrepreneurial ideas and transforming start-ups into successful businesses. While many firms face financing constraints (Banerjee & Duflo, 2014; Carpenter & Petersen, 2002), these constraints are more pronounced for female entrepreneurs: Women are less likely to have the necessary financing to start a business (OECD, 2017), they face challenges in attracting external equity (Ewens & Townsend, 2020; Guzman & Kacperczyk, 2019; Hebert, 2020), and their constraints to debt finance are more pronounced. Female entrepreneurs secure smaller loan amounts (Agier & Szafarz, 2013; Bartos et al., 2023; Bellucci, Borisov, & Zazzaro, 2010; Demirguc-Kunt et al., 2018), pay higher interest rates (Asiedu, Freeman, & Nti-Addae, 2012), are more likely to be denied a loan (Morazzoni & Sy, 2022), and are required to provide more loan guarantees (Brock & De Haas, 2023). Designing targeted policies to close the observed gender gap requires an understanding of whether the gap is driven by demand or supply factors, and to identify potential existing gender bias and its underlying mechanisms.

In this study, we focus on gender bias and its underlying mechanisms on the supply side of access to finance. Specifically, we analyze whether loan officers' assessment of a start-up's performance depends on the gender of its entrepreneurs and its team size. Using a lab-in-the-field experiment in Uganda, 451 loan officers of a large bank for entrepreneurship finance evaluate real-life business pitch decks, a short presentation of a business idea, where the gender and the team composition has been randomly manipulated by us. This design enables us to complement Brock and De Haas (2023) in isolating supply-side gender bias, and to disentangle underlying mechanisms for a potential gender bias in loan officers' evaluations, as we can distinguish gender differences in the evaluation of the business idea itself from that of the implementation challenges and capabilities of the entrepreneur.

Our setting is very suitable to answer this question. First, we study debt financing, the predominant source of access to finance for start-ups in low-income countries where venture capital is scarce (AVCA, 2022; Jaoui, Amoussou, & Kemeze, 2022).[1] Second, loan officers are a relevant sample since they are the first point of contact of an entrepreneur with the bank. Their role is to assess applicant's creditworthiness based on, often incomplete, information about the business and the entrepreneur's characteristics. However, predicting entrepreneurial success is a difficult task (Fafchamps & Woodruff, 2017; McKenzie & Sansone, 2019); and the resulting, partially subjective

---

[1] In 2022, the value of venture capital deals in Africa was 5.2 billion USD. While this constitutes a three fold increase over the previous year, the total amount is only around one percent of the total global value of venture capital deals (AVCA, 2022). Moreover, most of the venture capital deals are concentrated in countries such as South Africa, Egypt, Kenya, and Nigeria (Economist, 2022).

judgement leaves ample room for bias. Third, the controlled but natural RCT-like design allows us to identify causal effects of entrepreneurs' gender on loan officers decisions. These decisions are not confounded by other characteristics of the business or the entrepreneur that may otherwise affect decisions without being observable to the researcher. In particular, our design allows us to control for any factor arising from the demand side for access to finance, so we can focus exclusively on the supply side.[2]

Our design establishes the causal role of gender and team formation of entrepreneurs on loan officers' business evaluations. We present all business pitches with a founder, who has developed the business idea, and an implementer, who executes it. This serves two purposes. First, we disentangle whether any differential evaluation of the business potential stems either from gender bias in the assessment of the business idea, or from the perceived entrepreneurial ability and constraints an entrepreneur faces when operating a business by experimentally manipulating the gender of the founder and the implementer. Second, we compare gender biases in evaluations of individual entrepreneurs (i.e., sole proprietorship) versus teams of two entrepreneurs by varying whether the founder and the implementer are the same or two different entrepreneurs. While the first part is important to increase our understanding of gender biases in access to finance, the second part is crucial to understand the role of forming a team for entrepreneurial success, in particular in low income countries (Hsieh & Olken, 2014; Ulyssea, 2018). Most enterprises in these settings do not grow and often remain one-person businesses (Calderón, Iacovone, & Juarez, 2017). At the same time, entrepreneurship education programs, as well as incubators and accelerators that support start-ups, strongly emphasize the formation of entrepreneurial teams for sustained business success.[3] A potential gender difference in returns to entrepreneurial team size may also contribute to the under-representation of female businesses among larger firms in less developed countries.

Loan officers evaluate the business pitched along several dimensions. First, loan officers can invest into each presented business pitch and their return depends on business survival. Second, they select the best performing business among all five evaluated pitch decks. Third, loan officers can engage in additional costly screening to assess a business. In line with statistical discrimination (Arrow, 1973; Phelps, 1972), if loan officers are missing information about businesses from a certain class of entrepreneurs, they should be willing to invest resources into obtaining this information

---

[2]Demand side factors such as differences in risk attitude, or willingness to ask or negotiate may also be an explanatory factor for observed gender differences in access to finance (Bowles, Babcock, & Lai, 2007; Card, Cardoso, & Kline, 2015; Croson & Gneezy, 2009; Niederle, 2016).

[3]From early entrepreneurship education programs to accelerators, the formation of an entrepreneurial team is often required (e.g., the "LaunchX" program for high school students or the "Berlin Startup School Accelerator"). Even the world's largest and most successful incubators, such as "YCombinator" or "Techstars", strongly encourage the formation of an entrepreneurial team prior to application. The same is true for successful African incubators like "The Baobab Network".

as long as the information is expected to change the prior belief. The evaluations above are incentivized based on the real-life business performance of the pitching start-ups around two years after pitching the business idea in a business plan competition. Additionally, we elicit non-incentivized probabilistic beliefs about business success and a subjective measure of the perceived quality of the business idea. The selected outcomes are informative about the entire distribution of loan officers' evaluations of the future business profitability. This allows us to relate our findings to both equity and debt financing, which are arguably concerned with different aspects of firm performance: business success for high returns on equity and firm survival for loan repayment.

We find a sizable gender bias for businesses of individual entrepreneurs. Loan officers invest around 7 percent less in businesses by female entrepreneurs, they are 27 percent less likely to select a pitch as the best businesses when it is pitched by a female entrepreneur, and they consider the probability of failure to be 18 percent higher when the same idea is pitched by a female entrepreneur. These effects are more pronounced among loan officers who hold gender biased attitudes, who are less experienced, and who are female. The observed premium for individual male entrepreneurs over individual female entrepreneurs is in line with the type of clients loan officers usually interact with: 70 percent of them are male. The remaining outcomes allow us to examine potential channels driving the result. First, there is no gender difference in the subjective evaluation of business idea quality implying that the gender bias is not driven by animus against ideas developed by women. Second, the absence of gender disparities in the costly screening process suggests that loan officers do not perceive they lack information about female-led enterprises. Instead, we conjecture that the observed gender bias stems from differential assessments of women's entrepreneurial ability or external constraints when running a business.

In contrast, we do not observe a similar gender bias in the evaluation of teams of two entrepreneurs. Loan officers do not invest differently in businesses when they were founded or implemented by a female member of the entrepreneurial team. This null result is not caused by lack of variation, low power, or lack of attention or effort. Further, investment behavior is correlated with other proxies of business idea quality at the individual level, so we are confident in the measure's validity. We do find some indication of a different type of a bias at the top, a penalty in the evaluation of mixed-gender teams. A business pitch from mixed-gender teams is less likely to be selected as the best performing business, although the result does not always reach statistical significance. Comparing teams to individual entrepreneurs shows that loan officers do not evaluate their business pitches differently, on average. Our results allow us to rule out that the contrasting results for individuals and teams are driven by relative unfamiliarity or by different preferences or beliefs of loan officers about either type of a business. First, loan officers do not demand more information

about teams. Second, loan officers evaluate the profitability of teams and individuals equally. Taken together, despite the fact that almost all applications the bank typically processes are from individual applicants, teams would not likely suffer any penalty, nor receive a premium.

We contribute to three strands of the literature. First, we contribute to the literature on gender discrimination in entrepreneurial finance. Previous work has documented an investor bias against female entrepreneurs (Ewens & Townsend, 2020; Guzman & Kacperczyk, 2019; Hebert, 2020) and that female borrowers face tighter credit availability or less favorable loan terms (Agier & Szafarz, 2013; Alesina, Lotti, & Mistrulli, 2013; Asiedu, Freeman, & Nti-Addae, 2012; Bellucci, Borisov, & Zazzaro, 2010; Mascia & Rossi, 2017; Muravyev, Talavera, & Schäfer, 2009). Recent experimental work has pinpointed to loan officers' gender bias as a source of gender disparities in entrepreneurial finance (Alibhai et al., 2019; Brock & De Haas, 2023; Zhang, 2023). Closest to our study, Brock and De Haas (2023) provide causal evidence for gender discrimination in entrepreneurial lending. Using data from a lab-in- the-field experiment in Turkey, they document that loan officers indirectly discriminate against female loan applicants by requesting more loan guarantees. These effects are concentrated among female businesses in traditionally male industries, suggesting that gender stereotypes drive this discrimination. Yet, they do not find direct discrimination against female applicants. We contribute to this literature by cleanly identifying supply side factors for gender bias. Further, we advance this literature and investigate the mechanisms underlying the potential bias beyond differential treatment of male and female loan applicants. First, we examine whether differential treatment is the result of discrimination when evaluating business ideas or of different beliefs about women's abilities and constraints in the implementation of the business idea. Further, we study differences in screening efforts for male and female entrepreneurs. This differentiation is particularly important for tailoring policies to increase women's participation in credit markets. Lastly, we study how the formation of entrepreneurial teams interacts with gender bias.

Second, we contribute to the literature on the determinants and biases in predicting business success and how this affects access to finance. The prediction of entrepreneurial success is a difficult task for both human experts and state-of-the-art machine learning approaches (Fafchamps & Woodruff, 2017; McKenzie & Sansone, 2019). Yet, loan officers' ability to properly evaluate potential business success is key for viable entrepreneurial finance, in particular when information on the business and loan applicant is scarce. Information scarcity is prevalent in many low-income countries without existing credit registries (Djankov, McLiesh, & Shleifer, 2007) or systematic business accounts. Subjective evaluations are prone to gender biases (Lee & Huang, 2018) and information-scarce credit markets allow for animus driven behavior and favoritism (Blanchflower, Levine, & Zimmerman, 2003; Younkin & Kuppuswamy, 2018). Cole, Kanz, and Klapper (2015)

show that high-powered incentives induce loan officers to provide more effort into screening loan applications, while volume-based incentives can lead loan officers to overlook valuable soft information (Agarwal & Ben-David, 2018). Even status symbols like obesity (which is perceived as a reliable signal of wealth in many low-income settings) are affecting loan approval decisions in such a low-information setting (Macchi, 2023). Reducing information frictions between the borrower and the loan officer by cultural proximity (Fisman, Paravisini, & Vig, 2017) or the same gender (Beck, Behr, & Madestam, 2018) improves access to finance, loan conditions, and repayment. We contribute to this literature by introducing gender bias as a possible confounding factor in the evaluation of business potential. Unlike Beck, Behr, and Madestam (2018), who document homophily and in-group favoritism in the loan terms for first-term borrowers in an Albanian bank, we do not observe preferential in-group treatment in business evaluation. One central difference in our study is that we exclude any effects arising from the demand side, which suggests that in-group favoritism emerges through direct communication during the screening process.

Last, we also extend the understanding of underlying sources of gender bias in access to finance. Typically, studies aim at providing evidence supportive of either taste-based (Becker, 1957) or belief-based (Arrow, 1973; Phelps, 1972) types of discrimination (Gonzales Martinez et al., 2020; Macchi, 2023; Montoya et al., 2020). Our subjective assessment about the business idea and the incentivized information acquisition task allows us to make inference about the role of taste- and belief-based discrimination. On top, our novel design allows us to separate loan officers' evaluations of the idea quality from the business implementation capacity, and that we locate the sources of loan officer biases in the implementation ability of female entrepreneurs and not in their idea quality. Understanding these underpinnings of the bias allows policy makers to design effective tools to address the inequalities.

2 Experimental Design

In our lab-in-the-field experiment in Uganda, loan officers evaluate a set of business pitch decks from start-up enterprises. Our objective is to examine whether these evaluations differ along two dimensions: the gender of the entrepreneur and the formation of entrepreneurial teams. With regard to gender, our study design enables us to differentiate whether any observed differences stem from varying assessments of the business idea itself or of the implementation challenges and capabilities of the entrepreneur. Business ideas are evaluated using two measures: first, determining whether to invest in the showcased business and second, the selection of the best performing business among all the presented pitch decks. These decisions are incentivized based on the real-life performance of

the start-up enterprises that created the business pitch. Additionally, we analyze differences in the screening effort of start-up businesses and non-incentivized beliefs about business idea quality and business performance.

2.1 Sample and Setting

We partner with a large Ugandan commercial bank that specializes in lending to small-scale businesses and entrepreneurs. We selected 28 branches with more than eight loan officers that are feasible to reach in a one-day trip from the capital, Kampala, or other major Ugandan cities. Our sample covers 35 percent of all branches of the bank and around 40 percent of all loan officers. In each branch, we invite all loan officers who handle business-related loans to participate in our experiment without informing them about the content of the study. Participation was entirely voluntary, and before commencing the experiment, loan officers were informed that their involvement would entail evaluating various real-world business ideas. The facilitator proceeded to introduce the survey's structure and question format, ensuring clarity on the incentivized questions and providing guidance on navigating the survey sliders for selecting the desired answers (see Appendix A.3 for details on the introduction). Our final sample consists of 451 loan officers. They are on average 34 years old, 55 percent are female, and they have an average of 6.7 years of experience in the position.

The business pitches the loan officers evaluate in our experimental sessions have been presented by graduates of an entrepreneurship academy at a business plan competition. In a related study, we assess the impact of entrepreneurship academies on the business performance of these start-ups (see Bartos et al., 2023). Entrepreneurship academies are run at several Ugandan universities with university students interested in pursuing entrepreneurial careers. We follow these nascent entrepreneurs from their application to the entrepreneurship academy until around two years after they have completed the training and participated in the business plan competition. For each business pitch, we have detailed information on the team of entrepreneurs and their business performance around two years after the business idea was pitched. The evaluation decisions of the loan officers in our experiment are incentivized based on the real-life information on business performance from the pitching start-up businesses.[4]

We selected five pitch decks from the sample of 58 pitch decks that were pitched at the business plan competition. First, we excluded pitch decks that did not contain enough information about (expected) business performance for evaluators to make an informed decision. Second, we excluded ideas that were clearly perceived as either male or female businesses in our pre-testing.

---

[4]We have received informed consent from all founders that their pitch decks can be used for the purposes of a research study.

We additionally validated our identifying assumption that participants cannot infer the gender of the entrepreneurial teams solely by looking at their idea in a survey with 38 Ugandan university students.[5] We do not detect strong beliefs about the gender of the business owner(s): While actual pitch decks by males or male teams were evaluated as more male relative to female or female team businesses (p=0.06), the modal belief is that the idea came from a team with an equal proportion of men and women (63 percent).

2.2 Conceptual Framework

For our evaluation experiment, we standardize the presentation of the business pitches. All pitch decks are presented with a founder and an implementer (i.e., the *CEO* or *manager*). We make it clear that the founder has developed the business idea, while the implementer executes the business idea. The founder and the implementer may or may not be the same person.

We model the perceived business performance (B) as a function of both the quality of the business idea (Q), as well as the implementation of the idea (I). To understand gender-specific business evaluations, both parameters are gender-specific $g = \{M, F\}$, such that we have $B(Q_g, I_g)$. Varying the gender of both dimensions allows us to disentangle whether a gender-specific business evaluation originates from a differential evaluation of the idea quality itself, or from different perceptions about the potential of an entrepreneur to implement it. While differences in idea quality indicate gender bias in the evaluation of the business idea, different beliefs about the potential to implement an idea may either stem from gender-specific beliefs about (external) constraints or the (personal) ability to implement the idea. To understand how team formation influences business evaluations, in particular if there are gender-specific evaluations for female and male businesses, we vary whether the businesses are founded by an individual entrepreneur or by a team of two entrepreneurs.

2.3 Gender and Entrepreneur(s) - Exogenous Variations

We exogenously vary two components in the evaluation of the business performance: First, we vary the gender of both the founder and the implementer and compare the loan officer's business evaluations across these four founder-implementer gender combinations. Second, for founder-

---

[5]To do so, we first removed all identifiers of the actual entrepreneurs from all pitch decks. Then, each student evaluated a randomly selected subset of 20 pitch decks out of the full sample of 58 pitches. We asked the students whether they thought "the owner or the group of owners is more likely to be [all male / mostly male / male and female in equal proportion / mostly female / all female]".

implementer combinations with the same gender, we vary whether the business is proposed by a team of two entrepreneurs or an individual entrepreneur.

Specifically, a loan officer i evaluates the business success $B_i^p(Q_g, I_g)$ of pitch deck p. Every loan officer sees the same five pitch decks in the same sequence. We randomly assign the founder-implementer gender combinations for each pitch deck across loan officers resulting in a between-subject design. This means that for a pitch deck p, a loan officer i either evaluates $B_i^p(Q_M, I_M)$, $B_i^p(Q_M, I_F)$, $B_i^p(Q_F, I_F)$, or $B_i^p(Q_F, I_M)$.

We vary the gender of the founder and implementer in the following way: We remove all personal information from each pitch deck, i.e., all information on the entrepreneurs proposing this business pitch. In the next step, we create four versions of the pitch deck. We assign a founder-implementer gender combination to each of the four anonymized pitch deck clones. For this, we vary the dimensions of the *founder's* gender and *implementer's* gender (male vs. female) in a 2x2 design. The gender of the founder and implementer are revealed by their names on the pitch deck (without photos, or any additional information). We made sure that the used names are clearly associated with one gender only and that ethnicity, religion, socio-economic status, or other characteristics could not be inferred from them.[6]

We then vary the team formation of entrepreneurs by introducing a fifth pitch deck clone in which the founder and the implementer are the same person, i.e., an individual entrepreneur. With a probability of 50 percent, the entrepreneur is male, and with 50 percent female. For each pitch deck p, we randomly assign the five-pitch deck clones across participants. We assign four-pitch deck clones of teams of two entrepreneurs with four different founder-implementer gender combinations and one pitch deck clone of an individual entrepreneur with a random gender distribution.[7]

2.4   Evaluation of Business Ideas

We elicit both incentivized and unincentivized decisions to evaluate the business ideas. Our two main outcome variables are the incentivized measures *Investment* and *Best business*. Both decisions are incentivized based on the real-life business performance of this business as follows. *Investment*

---

[6]We selected the names we assigned to the pitch decks as follows. The name is either a real name of a team member or a name of another participant of the entrepreneurship academy. We tested a set of 30 names of academy graduates among 10 Ugandan natives on whether ethnicity, religion, socio-economic status, or other characteristics could be inferred from these names. We selected five sets of names (two female names and two male names each) that are general enough such that respondents could not infer anything about ethnicity, socio-economic status, or level of education. We excluded all names for which gender was not clear to all respondents. All names we used are associated with Christian religion, so they are not confounded by religious identity either. See the list of all names is in Appendix Table A1.

[7]Loan officer characteristics are balanced across the two gender realizations (see Appendix Table A2). All other manipulations are within-subject.

is a continuous variable stating the amount that participants invest in each pitch deck. Loan officers are endowed with 5,000 UGX that they can invest (in increments of 500 UGX) in each business.[8] The investment amount is doubled if the corresponding real-life business reports positive profits around two years after pitching the idea. The investment is lost if this business reports negative profits or does not exist anymore. Investors keep the non-invested part of the endowment. This outcome captures loan officers' ability to predict business survival for each pitch deck.

After all pitch decks have been evaluated individually, participants select the *Best business* which they believe has generated the highest profits. Loan officers receive a fixed 5,000 UGX bonus payment if they identify the real-life business with the highest profits and nothing otherwise. This outcome captures loan officers' ability to identify the best performing business.

To gain insights into mechanisms, we provide loan officers with additional costly screening options. Investment payout will be based on one selected pitch deck and loan officers have the option to purchase further information on the entrepreneurs and/or the business. Subsequently, they may revise their initial investment decision for the payoff-relevant pitch deck. We present a list of information items about the entrepreneur's background and the business.[9] Loan officers state which information they would need to best assess the pitch deck and they decide whether and which pieces of information they want to purchase. Each piece of information costs a fixed amount of 200 UGX.[10] The decision to purchase information is incentive compatible. Participants know that they will have a chance to revise their investment decision after the possibility to obtain the additional information. It is thus in their best interests to select the information they deem relevant. We generate the following outcome variables: (i) an indicator variable on whether a loan officer purchased any information, (ii) the number of information pieces purchased, and (iii) indicator variables on whether a loan officer purchased the information for each piece of information.

The following unincentivized measures are our secondary outcome variables. *Idea quality* is based on two survey questions for each pitch deck, i.e., whether the loan officer agrees that *the business meets a need or solves a problem in Uganda* and *that there is a market for this business idea in Uganda. Idea quality* is the average of both questions, which are answered on a scale from 0 to 100. *Beliefs about profits* for each pitch deck are measured by the probability distribution across the

---

[8]This amount corresponds to around 1.28 EUR in December 2022 when the experimental sessions were implemented with an exchange rate of 3,858 UGX/EUR.

[9]The following items are displayed on the list: (1) All team members owning the business, (2) Professional references for business owners, (3) Professional experience of the business owners, (4) Professional network of the creators, (5) Financial support from family members this business has received, (6) External financing obtained, and (7) Volume of sales, revenues, and profit margins.

[10]As we only have a subset of this information available for the payoff-relevant pitch deck, loan officers only pay for those selected categories for which the information is actually available.

three options that this business idea will either (i) fail within the first year, (ii) survive in the first year and make small profits, or (iii) survive in the first year and make large profits.

Finally, we asked three questions on gender norms (Scholz et al., 2014)[11], and collected basic demographics of loan officers (gender, age, years of experience).

2.5 Procedures

The experimental sessions were conducted at the branch offices of our partner institution. We visited the branches outside the regular business hours to avoid client traffic or other distractions during the experimental sessions. Experimental instructions were explained by the research team using flip chart illustrations (see Appendix A.3). We ensured loan officers' understanding of the instructions by two comprehension questions.[12] All decisions were collected in a survey on a digital device. We either used the loan officers' personal workstations or provided tablets. Loan officers could proceed through the survey at their own pace. A research team member assisted them if needed. The experiment was programmed in Qualtrics.
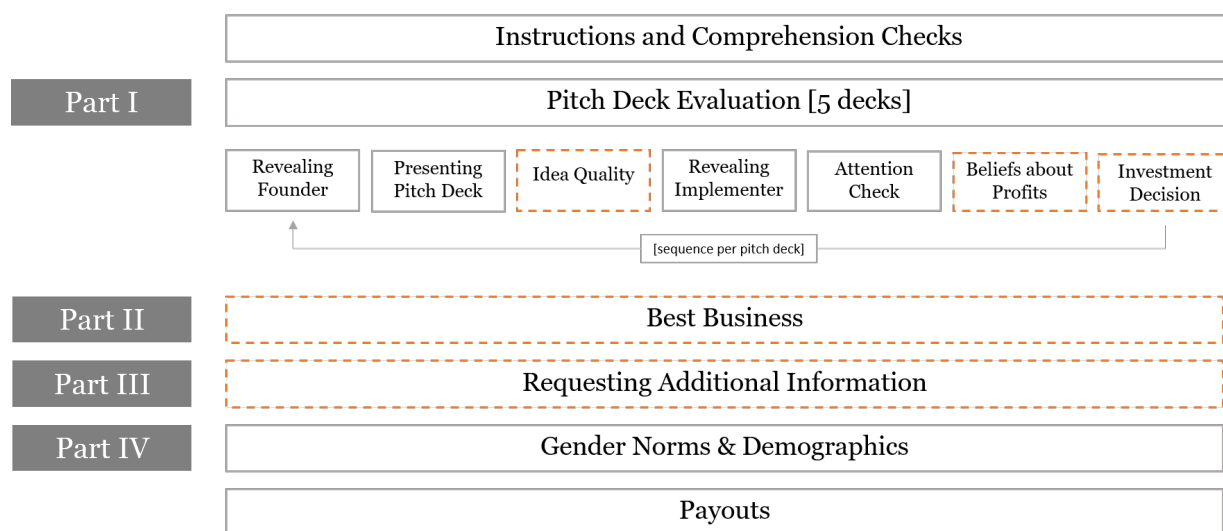
Notes. This figure presents an overview of the study design. The outcome measures are displayed in dashed boxes.

Figure 1: Design Overview

---

[11] We asked Questions R1c, R1d, R2b from Scholz et al. (2014) on how much the respondent agrees with the following statements on a 5-point Likert scale coded from 1. ...completely disagree to 5. ...completely agree: (i) *A man's job is to earn money; a woman's job is to look after the home and family.*, (ii) *A job is all right, but what most women really want is a home and children.* , and (iii) *Family life suffers when the woman has a full-time job.*

[12] Questions are: (i) "Imagine that you invest 2,500 UGX to the business and keep 2,500 UGX. The business reported that it still exists and makes profits. How much do you have in total?", and (ii) "Imagine that you invest 4,000 UGX to the business and keep 1,000 UGX. The business reported that it does not exist anymore. How much will you have in total?". Loan officers were only allowed to proceed when answering both questions correctly. Otherwise, the instructions were repeated.

The survey is organized in four parts (see Figure 1). In Part I, loan officers evaluate five pitch decks. Each pitch deck is presented in the same sequence: loan officers 1) learn who the founder of the business idea is, 2) see the business pitch, 3) evaluate the idea quality (note that this is independent of the identity of the implementer), 4) learn who the implementer of the idea is, 5) pass an attention check on the gender allocation for the founder and implementer[13], 6) indicate their probabilistic beliefs about business success, and 7) state the amount they would like to invest in the business. All pitch decks are presented in the same sequence to not confound the gender variation within each pitch deck with potential order effects from variations in the sequence. In Part II, loan officers select the business pitch they think has performed best. In Part III, loan officers can request additional information for the selected, payoff-relevant pitch deck, prior to a surprise option to revise their investment choice for this pitch deck. Lastly, in Part IV, we elicit gender norms and socio-demographics. See the full wording of the survey and screenshots in Appendix A.4.

Loan officer's final payoff comprises four components. First, loan officers receive a participation fee of 5,000 UGX. Second, loan officers receive an initial endowment of 5,000 UGX; they keep the part that they did not invest in the payoff-relevant business, and the return from the amount invested into this business. Third, the amount for the purchased information is subtracted from the participation fee. Fourth, loan officers receive a bonus payment of 5,000 UGX for correctly identifying the best performing business. Earnings were delivered via mobile money shortly after the experimental session. Average payouts for the one-hour session were 13,472 UGX, which is in the range of the average hourly wage (above 10,000 UGX for the loan officers in our sample).

3   Results

We document a bias against individual female businesses as opposed to individual male businesses, no gender bias for teams of entrepreneurs, and suggestive evidence of a bias against mixed-gender teams. The bias against individual female businesses seem to be driven by beliefs about implementation ability or implementation constraints, possibly magnified by individually held gender stereotypes. We first present results for individual entrepreneurs. Second, we turn to results for entrepreneurial teams. Finally, we compare decisions for individual entrepreneurs and teams.

---

[13]Participants see three statements about the description of the idea and the founding team. They can only proceed after indicating the correct answer.

3.1 Gender bias in the evaluation of individual entrepreneurs

Loan officers exhibit bias against individual female entrepreneurs in their investment decisions. We report results in a regression specification in Panel A of Table 1. Each loan officer evaluates one pitch deck of an individual entrepreneur, half of the these are female, the other half male entrepreneurs. The dependent variable is the amount (in UGX) invested in each pitch deck. The regressions report coefficients for indicators for a pitch deck of a female entrepreneur. The excluded category is a pitch deck of a male entrepreneur. Each regression includes pitch deck fixed effects. We report robust standard errors. On average, loan officers allocate 245 UGX (p=0.04) less to female businesses. The effect represents seven percent of the average amount invested in business ideas of male entrepreneurs (3,491 UGX). The result is robust to including individual controls (Table A3) and to removing the most inaccurate loan officers, i.e., ten percent of the participants who clicked most on the survey page when answering the comprehension questions correctly (Table A4). The gender difference in investment rates is present throughout the entire choice distribution (Figure A1). Our results imply that loan officers expect gender differences in the ability of businesses to generate profit, as we detail below.

Table 1: Investment and Best Business Decision

Panel A: Investment		Gender bias		LO gender		Experience	
		Low	High	Female	Male	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female Entrepreneur	-245.24**	-139.47	-355.85**	-289.02	-202.74	-265.18	-233.11
	(119.28)	(169.03)	(170.25)	(179.75)	(160.33)	(184.96)	(161.94)
Mean Dep. Var.	3,490.7	3,342.1	3,656.9	3,333.3	3,609.8	3,442.7	3,529.2
Observations	451	234	217	201	250	199	252
Panel B: Best Business							
Female Entrepreneur	-0.07*	-0.03	-0.11**	-0.10*	-0.04	-0.13**	-0.04
	(0.04)	(0.05)	(0.05)	(0.06)	(0.05)	(0.06)	(0.05)
Mean Dep. Var.	0.264	0.254	0.212	0.237	0.285	0.333	0.208
Observations	451	234	217	201	250	199	252

Notes. OLS Regressions of the dependent variable *Investment* (Panel A) or *Best Business* (Panel B) on the gender of the individual entrepreneur who founded and implemented the business. Panel A reports the incentivized decision of how much to invest in the pitch deck business from 0-5,000 UGX. Panel B reports the incentivized decision of selecting the best business idea; it is a probability. Column (1) reports the average effect, and Columns (2)-(7) split the observations according to different relevant observable characteristics. Columns (2)-(3) split by gender bias following International Social Survey Programme gender bias metrics (see footnote 11). The sample is split at the median. (4)-(5) are split according to the self-reported gender of the respondent, and (6)-(7) are split according to the median experience level. *Mean Dep. Var* indicates the mean of the dependent variable of the reference group. Standard errors are heteroskedasticity-robust and reported in parentheses. The table includes pitch deck FE in both Panels. Results are robust to correcting for multiple hypothesis testing accounting for the fact that we focus on two main outcome variables. Using the method by Barsbai et al. (2021), Column 1 corrected p-values are (p=0.083) and (p=0.053) for investment and best business, respectively. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

In line with the gender bias observed across the investment distribution, we also observe gender bias in the probability of female businesses being selected as the best performing business. Using a linear probability model with a similar regression framework, a female entrepreneur's business is 7 percentage points (p=0.052) less likely selected as the best relative to an otherwise identical business of a male entrepreneur (Table 1, Panel B), corresponding to a reduction of 26.9 percent of the average of a male entrepreneur's business (26.4 percent). This effect is robust to regression specifications with individual controls (Table A3). When focusing on the sample of accurate participants, we lack statistical power to detect significant effects, but the point estimate is very close to that detected in the full sample and both cannot be distinguished statistically (Table A4). These results are also reflected in the non-incentivized belief elicitation about business success (Table A5). Female businesses are predicted to have failed with a 4.08 percentage points (Column 1, p=0.063) higher probability than an otherwise identical male business, corresponding to 18.2 percent of the average of a male business (22.5 percent). Seventy percent of this effect stems from loan officers predicting business failure rather than small profits, although this reduction is not statistically significant on its own.

After the initial investment decision, loan officers have the possibility to acquire additional information about the payoff-relevant pitch deck and to reconsider their investment choice. While the point estimate for requesting additional information is positive for female businesses (Table 2), it is statistically insignificant. The lack of a significant effect prevents us from concluding whether the observed gender bias is driven by statistical discrimination (Arrow, 1973; Phelps, 1972). Nevertheless, the null effect of founders' gender in loan officers' assessment of the quality of the research idea in Table A6 rather speaks against taste-based discrimination driving the effect (Becker, 1957). The null result on idea quality also supports the hypothesis that loan officers' gender bias can be attributed to strong beliefs about gender differences in implementation ability or implementation constraints female-led businesses face. The idea quality measure is not incentivized and its validity may be limited in contrast to the incentivized measures. Yet, it correlates with the incentivized measures in the expected direction (Appendix Table A7).

We also document substantial heterogeneity in the magnitude of the bias by loan officer characteristics. First, the bias against female businesses using incentivized outcomes is most pronounced among loan officers who also exhibit greater general gender bias as measured by aggregated and averaged responses to three selected International Social Survey Programme questions on gender norms (Table 1, Panels A and B, Columns 2-3) (Scholz et al., 2014). While we do not find support for a general animus against female-led businesses, this finding indicates that the observed gender bias is reinforced by general gender-biased stereotypes: Loan officers

Table 2: Information Request

	1[Request additional information]								
	Requested info (1)	# Info (2)	Team Member (3)	References (4)	Experience (5)	Network (6)	Family F. (7)	External F. (8)	Sales (9)
Female Entrepreneur	.061	.043	-.009	-.027	-.007	-.029	.040	.062	.011
	(.104)	(.264)	(.064)	(.041)	(.056)	(.052)	(.055)	(.058)	(.073)
Mean Dep. Var.	.37	.72	.12	.1	.1	.097	.046	.097	.15
Observations	86	86	86	86	86	86	86	86	86

Notes. OLS regressions of the decision to request additional information about the pitch deck on the gender of the individual entrepreneur who founded and implemented the business. Column (1) reports the binary option whether the respondent decided to request additional information. Column (2) reports the total number of information items requested by the respondent. Columns (3)-(9) report the results for different information items, including: *all team members owning the business, professional references for business owners, professional experience of the business owners, professional network of the creators, financial support from family members received by this business, external financing obtained, volume of sales, revenues, profit margins, and none of the above. Mean Dep. Var* indicates the mean of the dependent variable of the reference group. Standard errors are heteroskedasticity-robust and reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

exhibiting higher general gender bias may hold stronger beliefs about gender differences in business implementation.[14]

Second, the effect is concentrated among female loan officers, but it is only statistically significant for the best business choice in this sub-sample (Table 1, Panels A and B, Columns 4-5). Even though it is not statistically distinguishable from the insignificant bias of male loan officers, the larger bias of females is in line with the so-called queen bee syndrome (Staines, Tavris, & Jayaratne, 1974).[15] In this syndrome, women who achieve individual success in male-dominated environments and attain high-status positions are more prone to supporting gender stereotypes. While this effect has mostly been used to describe behavior in hierarchical labor market settings, a financial institution may exhibit similar power asymmetries between loan officers and loan applicants.

Third, loan officer experience does not seem to affect the general gender bias but it reduces discrimination at the top, i.e. when selecting the best performing business (Table 1, Panels A and B, Columns 6-7). However, given the relatively large variance spanning between very recently employed loan officers and one officer serving 23 years, we see that the bias in selecting the best business is only reduced for the above median group with at least six years of experience. The finding should by no means be interpreted causally as we cannot separate experience effects from, for example, selection. Yet even if the causal link is the dominant factor, the effect only occurs in the medium to long term and does not result in eliminating the bias in its entirety.

The clear pattern documenting gender bias is further supported by the fact that the results not driven by limited comprehension, by limited effort on the side of the respondents, or by other confounds. The patterns in responses are consistent across different variables capturing project

---

[14]Gender bias is measured based on three questions, see footnote 11. The third question could also be misinterpreted and hence not reflect gender bias properly. Defining gender bias only based on the first two questions, does not change the direction of coefficients and the magnitude of results (Appendix Table A8).

[15]Similarly, Bagues and Esteve-Volart (2010) document that female candidates for positions in Spanish civil service are less likely to be hired if a hiring committee has a higher fraction of females.

quality. Examining correlations between the investment measure and other outcomes such as our second incentivized measure of selecting the best performing business, a non-incentivized rating of idea quality, or a probabilistic belief of high business profits, shows that all the variables are positively correlated, and the Pearson's correlation coefficients are highly statistically significant at $p<0.01$ (Table A7). Reassuringly, the probabilistic belief of an under-performing business in terms of profits is negatively and significantly ($p<0.01$) correlated with these variables. Finally, while clearly gender specific, the names assigned to the pitch decks were common enough not to be attributable to a specific demographic characteristic. This implies that other characteristics are unlikely to confound the discussed gender effect.

In sum, we observe a robust pattern of gender bias disfavoring individual female businesses by Ugandan loan officers. The effect is strongest for loan officers exhibiting gender bias in other domains and it seems to be stronger for female or less experienced loan officers. The bias is not related to beliefs about quality of business ideas but is rather driven by differences in beliefs about implementation ability or implementation constraints.

3.2   No gender bias in the evaluation of entrepreneurial teams

We no longer observe a systemic gender bias of loan officers when evaluating teams of two entrepreneurs, the founder and the implementer, in incentivized investment decisions. We also establish that the null result is well identified and sufficiently statistically powered, and it is not driven by lack of variance in the data, by limited accuracy of respondents, or by limited quality of responses.

First, we find no gender difference in the incentivized investment decision of loan officers. Our results imply that loan officers do not expect any gender differences in the ability of teams of entrepreneurs to generate profit. Panel A of Table 3 presents the results in a regression analysis. The dependent variable is the amount (in UGX) invested in each pitch deck. The regressions report coefficients for indicators for a pitch deck having a female founder, a female implementer, and a joint female founder and female implementer.[16] The excluded category is a pitch deck with a male founder and a male implementer. Each regression includes individual and pitch deck fixed effects and standard errors are clustered at the individual level. We also report an F-statistic and a p-value of a test of the sum of all three coefficients, in other words comparing the difference between a business

---

[16]The specification presented deviates from the pre-specified specification in the pre-analysis plan. There, we assumed no differences between mixed-gender and same-gender teams. Since this assumption does not hold in the data, we deviated from the pre-specified specification in our analysis. We present the pre-specified specification for the investment decision in Appendix Table A9 and, with the strong assumptions discussed above, our conclusions for teams remain unchanged. We detail the deviations form the pre-analysis plan in Appendix A.5.

with a male founder and implementer to one with a female founder and implementer. Column 1 of Panel A shows that, on average, there is no statistically significant effect of either of the gender combinations. The point estimates are very small, not exceeding two percent of the mean of the dependent variable. We also do not observe any difference in the cumulative distributions of the different founder and implementer combinations (Figure A2).

Table 3: Investment and Best Business Decision

Panel A: Investment		Gender bias		LO gender		Experience	
		Low	High	Female	Male	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female Founder	7.27	-179.28	201.81*	-86.33	77.00	-59.94	64.89
	(86.11)	(120.96)	(121.12)	(123.87)	(118.89)	(123.70)	(119.37)
Female Implementer	-59.54	-97.11	-27.13	-188.07	38.94	-110.85	-12.41
	(83.68)	(126.27)	(108.70)	(130.93)	(106.57)	(123.38)	(116.28)
Female Founder&Implementer	40.33	137.75	-54.46	209.18	-93.08	85.75	5.38
	(120.58)	(181.80)	(157.82)	(190.10)	(154.91)	(182.20)	(163.65)
Mean Dep. Var.	3,352.2	3,395.6	3,308.3	3,353.5	3,351.2	3,303.0	3,393.4
F-Statistic	.017	1	.91	.25	.031	.43	.2
P-value	.9	.31	.34	.62	.86	.51	.66
Observations	1804	936	868	804	1000	796	1008
Panel B: Best Business							
Female Founder	-0.01	-0.07*	0.05	-0.06	0.03	-0.00	-0.02
	(0.03)	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)
Female Implementer	-0.02	-0.04	-0.00	-0.09*	0.03	-0.06	0.01
	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Female Founder&Implementer	0.08**	0.14**	0.03	0.18***	0.00	0.08	0.09
	(0.04)	(0.06)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)
Mean Dep. Var.	0.207	0.231	0.183	0.268	0.161	0.206	0.208
F-Statistic	2.4	.27	2.5	.43	2.2	.15	3
P-value	.12	.6	.12	.51	.14	.7	.086
Observations	1804	936	868	804	1000	796	1008

Notes. OLS Regressions of the dependent variable *Investment* (Panel A) or *Best Business* (Panel B) on the gender of the founder and the implementer in teams. Panel A reports the incentivized decision of how much to invest in the pitch deck business from 0-5,000 UGX. Panel B reports the incentivized decision of selecting the best business idea; it is a probability. Column (1) reports the average effect, and Columns (2)-(7) split the observations according to different relevant observable characteristics. (2)-(3) split by gender bias following International Social Survey Programme gender bias metrics (see footnote 11). The sample is split at the median. (4)-(5) are split according to the self-reported gender of the respondent, and (6)-(7) are split according to the median experience level. *Mean Dep. Var* indicates the mean of the dependent variable of the reference group. Standard errors are clustered at the individual level and reported in parentheses. The table includes pitch deck and individual FE in Panel A and pitch deck FE in Panel B. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Examining heterogeneity, we present the result of a regression specification by gender bias of loan officers, their gender, and their experience. The null result documented in the aggregate sample holds true also for all sub-groups analyses. If anything, we observe a marginally statistically significant positive effect for a female founder and male implementer business relative to a male

founder and implementer business among loan officers with high general gender bias (p=0.097), but this does not differ from what would be expected statistically and it is also not robust to a modified measure of the gender bias.[17]

Reassuringly, as in the case of individual entrepreneurs, we document that the result is not driven by limited comprehension or by limited effort on the side of the respondents. First, Table A10 shows that the cross-correlations across different variables capturing project quality are going in the same direction and are similar to those observed for single businesses (as in Table A7). All Pearson's correlation coefficients are highly statistically significant at $p < 0.01$. Second, the investment measure is incentivized, which motivates loan officers to pay attention and to carefully consider their choices. Removing the choices of ten percent of the most inaccurate individuals who required most clicks to answer the comprehension questions correctly, does not change the results (Table A12). Third, the null result is not a product of a lack of variance in the dependent variable. Histograms in Figure A3 show that there is a sufficient variation, and the distributions are continuous. Fourth, even though all projects we selected are evaluated positively with investments averaging 3,317 UGX, there is a statistically significant variance between investment acrossprojects with average investments ranging from 3,065 UGX for pitch deck 2 to 3,460 UGX for pitch deck 4 ($p < 0.01$, see Table A11). Ceiling or floor effects thus cannot explain the null result, either. Appendix Table A11 shows that the null result holds across all pitch decks, respectively. It is particularly notable that it holds even for pitch deck 1. This decision is the first investment decision the loan officers made. It is thus closest to a between subject design, which is least susceptible to possible experimenter demand or order effects. Even though we do not randomize the order of pitch decks, pitch deck 1 ranks in the middle of the quality ranking, so it is an unlikely outlier.

In contrast to the gender bias documented for individual entrepreneurs in the previous subsection, we find no differential effect by gender or gender composition of a team of entrepreneurs on incentivized investment decisions. Our design allows us to conclude that the lack of bias is true both for business founders and implementers. The effect is not caused by lack of variation, low power, lack of accuracy or attention, or by other confounds. As the investment behavior is correlated with other proxies of business idea quality, we are confident that the measure is valid, and there is indeed no gender bias in these investment decisions.

---

[17]As in Footnote 14, we define gender bias based on the first two questions. This does not change the direction of coefficients and the magnitude of results, but renders the female founder coefficient insignificant in the case of loan officers with high gender bias (Appendix Table A8).

3.3 Gender composition in entrepreneurial teams affects selection of top-performing business

In Table 3, Panel B, we report effects of pitch deck gender composition on loan officer's propensity to select a pitch deck as the best performing business from the five evaluated pitches. We use the same regression specification as in Panel A, but the dependent variable is now an indicator for a given project being selected as the best performing business. Thus, we no longer include individual fixed effects. Column 1 in Panel B presents aggregate results. It reveals a positive marginal effect of 8 percentage points for the female founder and implementer business (p=0.041). This effect is statistically significant when compared to either of the mixed-gender teams as both are individually statistically insignificant but with a negative point estimate. However, the overall effect of female entrepreneurial teams compared to male ones is marginally insignificant (p=0.124), indicating no strict preference of female teams over male teams.

The aversion against mixed-gender teams emerges especially in two subgroups in Table 3: loan officers with low gender bias (Column 2, Panel B) and female loan officers (Column 4, Panel B). It manifests itself through negative, similar-sized coefficients for the indicators for a female founder and a female implementer, a simultaneous positive coefficient for the female founder & implementer indicator, and an insignificant F-test comparing same-gender teams. In other words, while there is no difference in loan officer evaluations of all-female and all-male teams, there is a relative penalty for mixed-gender teams. Even though the bias against mixed-gender teams is not universal, it is present among a sizable group of loan officers.

Our results are robust to focusing on accurate loan officers (Table A12). The effect does not seem to be driven by a specific pitch deck when studying the results for each pitch deck separately (Table A11).

Overall, while we observe a bias against selecting pitch decks with mixed-gender founder and implementer combinations, the results also do not reflect a general bias against a specific gender. This bias is concentrated among businesses on the right tail of the performance distribution; we only document it for selecting the best performing business, but not for the investment decisions that reflect business survival. Reassuringly, we observe the same pattern for the non-incentivized probabilistic belief about business success: Though insignificant, the point estimates go in the same direction for the belief of achieving large profits, while no such effect emerges for beliefs about small profit beliefs or business failure (Table A13).

A possible explanation may be that loan officers are relatively less familiar with entrepreneurial teams, and mixed-gender teams even more. Loan officers may then feel less qualified to evaluate

such teams or their decisions may be more noisy. Standard models of information processing would predict increased demand for any possible information about businesses that are less familiar, as the informational value of extra information would be higher as long as it is expected to change prior beliefs. Yet we find no effect on requesting additional information (Table 4). It is noteworthy that the average demand for information and the number of information requested does not differ across same-gender and mixed-gender teams. This speaks against a possible explanation that the bias is caused by loan officers being less familiar with mixed-gender business teams.

Table 4: Information Request

| | 1[Request additional information] | | | | | | | | |
	Requested info (1)	# Info (2)	Team Member (3)	References (4)	Experience (5)	Network (6)	Family F. (7)	External F. (8)	Sales (9)
Female Founder	-.10	.08	.05	-.03	.06	.05	.02	.00	-.07
	(.08)	(.23)	(.05)	(.05)	(.05)	(.04)	(.03)	(.04)	(.06)
Female Implementer	-.09	-.04	-.01	-.04	-.01	.02	.01	.02	-.03
	(.07)	(.19)	(.05)	(.05)	(.04)	(.04)	(.03)	(.04)	(.06)
Female Founder&Implementer	.17	.11	-.02	.01	-.00	-.04	.01	-.01	.15
	(.11)	(.34)	(.07)	(.06)	(.07)	(.06)	(.05)	(.07)	(.09)
Mean Dep. Var.	.39	.75	.13	.094	.097	.083	.055	.1	.19
F-Statistic	.0335	.342	.168	1.03	.82	.382	.934	.126	.364
P-value	.855	.559	.683	.311	.366	.537	.334	.723	.546
Observations	365	365	365	365	365	365	365	365	365

Notes. OLS regressions of the decision to request additional information about the pitch deck on the gender of the founder and the implementer in teams. Column (1) reports the binary option whether the respondent decided to request additional information. Column (2) reports the total number of information items requested by the respondent. Columns (3)-(9) report the results for different information items, including: *all team members owning the business, professional references for business owners, professional experience of the business owners, professional network of the creators, financial support from family members received by this business, external financing obtained, volume of sales, revenues, profit margins, and none of the above. Mean Dep. Var* indicates the mean of the dependent variable of the reference group. Standard errors are reported in parentheses and are clustered at the individual level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

3.4 No difference in evaluations of individuals and teams

Finally, we show that there is no general difference in loan officers' evaluations of individual entrepreneurs and entrepreneurial teams. We observe a systematic gender bias for individual female entrepreneurs but not for entrepreneurial teams, so a natural question is how evaluations for teams and individual entrepreneurs differ. Table 5 answers the question by reporting results of a regression with an indicator for an individual entrepreneur. The omitted variable is an entrepreneurial team. The regressions controls for pitch deck fixed effects and standard errors are clustered at the level of the loan officer. We examine the entire range of outcomes. Columns 1, 2, and 5 to 7 also control for individual fixed effects.

The results show no systematically different treatment of individual entrepreneurs and teams for the investment decision, the probability of picking the business as the best performing one, and all other outcomes of interest. All null results are relatively precisely estimated as being not statistically

Table 5: Teams vs. Individuals

	Investment (1)	Best Business (2)	Requested Info (3)	# Info (4)	P[failure] (5)	P[small profits] (6)	P[large profits] (7)
Individual	46.62	.04	.04	.07	-.69	.39	.29
	(62.18)	(.03)	(.06)	(.17)	(1.10)	(1.20)	(1.36)
Mean Dep. Var.	3317	.19	.39	.72	25	40	35
Observations	2255	2255	451	451	2255	2255	2255

Notes. OLS Regressions. *Mean Dep. Var* indicates the mean of the dependent variable of the reference group. Clustered standard errors at the individual level, as well as round fixed effects and individual fixed effects except for Columns (3) & (4). These columns have robust standard errors. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

significantly different from zero. Hence, we do not find any support for entrepreneurial teams being treated differently from individuals.

We conjecture that neither unfamiliarity with entrepreneurial teams, nor a specific preference or a belief about running a business in teams can explain the difference in gender bias documented for individual entrepreneurs and teams. Unfamiliarity would likely result in an increased demand for information and with an increased variance over the profit distribution. Columns 4 to 8 do not support this hypothesis. Similarly, if loan officers had a specific preference for either individuals or teams or if their beliefs about the quality of either type of business differed in general, we should observe systematically different outcomes. Yet, we observe no differences along all dimensions of interest.

4 Conclusion

In this study, we analyze whether loan officers evaluate start-up business potential differently for male and female entrepreneurs, both as individual entrepreneurs or in entrepreneurial teams, using a lab-in-the-field experiment with 451 loan officers in Uganda. Our novel design separating the business founder from the implementer in our two-person entrepreneurial teams allows us to locate potential bias either in the evaluation of the business idea or the perceived entrepreneurial capabilities and implementation challenges entrepreneurs face when operating a business. Evaluation decisions are incentivized based on real-life business performance of the start-ups.

We find a sizable gender bias in business evaluations of individual entrepreneurs and no such bias for entrepreneurial teams. The bias for individual entrepreneurs is more pronounced among loan officers who hold gender biased attitudes, who are less experienced, and who are female. We do not find gender differences in costly screening effort or in the subjectively assessed quality of the

business idea, supporting neither animus against female-developed business ideas, nor perceived lack of information about individual female-led enterprises. Hence, we attribute the documented gender bias to differential assessments of individual women's entrepreneurial ability to operate a business and of the external constraints such businesses face. On average, teams are not evaluated nor screened differently than individual entrepreneurs. While loan officers display some preference for same-gender teams –independent of the entrepreneurs' gender–, we do not detect a systemic bias against any female entrepreneur of the team, which further speaks against animus as a potential driver of the gender bias for individual entrepreneurs.

It remains puzzling why only individual female businesses are facing a penalty, and not female entrepreneurial teams. While our research design does not allow us to provide a definite answer, we speculate that female teams signal greater commitment to the business. Teams of entrepreneurs are less likely to establish businesses out of necessity, a reason for opening a business stated predominantly by women (Kelley, Singer, & Herrington, 2016). It seems that loan officers do not expect such a difference for businesses founded and operated by individual males. In addition, previous literature predominantly reports discrimination against females in male-dominated sectors (Brock & De Haas, 2023; Hebert, 2020). This gender incongruence-based bias may be present in our study: In our design validation survey on the perceived gender composition of the entrepreneurial teams of all short-listed pitch decks, the five selected pitch decks are perceived about 0.2 standard deviations more male (p=0.02) than the not selected ones. Still, teaming up seems to counteract the higher barriers that women arguably have in these sectors and potentially even signal positive selection of these entrepreneurs (Ashraf et al., 2023; Goldin, 2020). Teaming up may also demonstrate cooperativeness, a trait associated with successful entrepreneurs (Cooper & Saral, 2020), and indicate high social capital, which appears to be particularly important to female entrepreneurs (Cohoon, Wadhwa, & Mitchell, 2010).

Regarding the generalizability of our results, we follow the SANS (selection, attrition, naturalness, and scaling) classification of List (2020). On selection, our study has been conducted among almost half of the entire population of loan officers of a major Ugandan bank for entrepreneurship finance, oversampling branches closer to major urban areas. Attrition was not an issue. Only eight loan officers present at the time of the experimental session did not participate due to other commitments. On naturalness, despite the decisions being framed in the context of a research study, loan officers made incentivized decisions in their regular workplace about real start-up pitch decks. The pitch decks were selected from a pool of pitches developed for a competition attended by Ugandan venture capitalists where stakes were high. For the purposes of the study, we only manipulated the names on the pitch decks to signal gender. Finally, we also comment

on potential for scaling of our results beyond the sample studied. While Uganda is characterized by rather low financial development (rank 164 out of 183 for the Financial Development Indicator (IMF, 2021)) and gender equality (rank 131 out of 170 of the UN Gender Inequality Index (UNDP, 2022)), our results on gender bias, in particular the facts that they are driven by loan officers with larger gender bias, confirm the results by Brock and De Haas (2023) for Turkey, a country that scores much higher on financial development (rank 38 out of 183) and gender equality (rank 65 out of 170). This suggests that our results are indeed relevant for countries even beyond those similar to Uganda in terms of financial development and gender equality.

Our results have two implications. First, the observed bias against individual female entrepreneurs can be attributed to loan officers' beliefs that women have lower capabilities to run the business and face more pronounced implementation issues. Understanding whether such beliefs are correct or whether and how they are biased would be critical for designing interventions aimed at reducing the bias (Bohren et al., 2023). In the first case, more tailored policies to reduce structural disadvantages facing individual female entrepreneurs would be required. In the second case, loan officers should be provided with more accurate information regarding individual female entrepreneurs' performance to correct their beliefs. This seems particularly important since biases based on incorrect beliefs reinforce existing gender gaps, impeding a possible corrections of wrong beliefs without an external stimulus.

Second, in contrast to the results for individual entrepreneurs, the results documenting the lack of a bias for entrepreneurial teams, and the equality in average evaluations of teams and individual entrepreneurs introduces more nuance to the discussion about the role of gender in access to finance and firm growth. Since start-ups with teams of entrepreneurs are more profitable relative to individual entrepreneurs in high-income countries (Åstebro & Serrano, 2015) and start-up accelerators and incubators promote team creation, access to finance for team enterprises may not be disadvantageous to women. That is, as long as entrepreneurs can credibly signal the team composition of their business or apply for funding jointly as a team. Moreover, policies aimed at team creation for start-up enterprises may have an additional benefit of equalizing access to finance. In a dynamic setting, the penalty in evaluations of individual female enterprises may also contribute to under-representation of female businesses among larger firms, due to the difficulties at the start of their potential growth trajectory. What remains to be understood is why women face a penalty when running a business individually and not in a team of female entrepreneurs and why Ugandan loan officers do not evaluate teams better than individual entrepreneurs.

References

Agarwal, S., & Ben-David, I. (2018). Loan prospecting and the loss of soft information. *Journal of Financial Economics*, *129*(3), 608–628.

Agier, I., & Szafarz, A. (2013). Microfinance and gender: Is there a glass ceiling on loan size? *World Development*, *42*(1), 165–181.

Alesina, A. F., Lotti, F., & Mistrulli, P. E. (2013). Do women pay more for credit? Evidence from Italy. *Journal of the European Economic Association*, *11*, 45–66.

Alibhai, S., Donald, A. A., Goldstein, M., Oguz, A. A., Pankov, A., & Strobbe, F. (2019). Gender bias in SME lending: Experimental evidence from Turkey. *World Bank Policy Research Working Paper, No. 9100.*

Arrow, K. (1973). Higher education as a filter. *Journal of Public Economics*, *2*(3), 193–216.

Ashraf, N., Bandiera, O., Minni, V., & Quintas-Martınez, V. (2023). Gender roles and the misallocation of labour across countries. *Working Paper.*

Asiedu, E., Freeman, J. A., & Nti-Addae, A. (2012). Access to credit by small businesses: How relevant are race, ethnicity, and gender? *American Economic Review*, *102*(3), 532–37.

Åstebro, T., & Serrano, C. J. (2015). Business partners: Complementary assets, financing, and invention commercialization. *Journal of Economics & Management Strategy*, *24*(2), 228–252.

AVCA. (2022). *Venture capital in africa report.* African Private Capital Association.

Bagues, M., & Esteve-Volart, B. (2010). Can gender parity break the glass ceiling? Evidence from a repeated randomized experiment. *Review of Economic Studies*, *77*(4), 1301–1328.

Banerjee, A. V., & Duflo, E. (2014). Do firms want to borrow more? Testing credit constraints using a directed lending program. *Review of Economic Studies*, *81*(2), 572–607.

Barsbai, T., Licuanan, V. S., Steinmayr, A., Tiongson, E. R., & Yang, D. (2021). *Information and immigrant settlement* (tech. rep.). Working Papers in Economics and Statistics.

Bartos, V., Czura, K., Kaiser, M., Opitz, T., & Shanks, B. (2023). Identifying and teaching high-growth entrepreneurship: Experimental evidence from entrepreneurship academies for university students in Uganda. *(Unpublished Manuscript).*

Beck, T., Behr, P., & Madestam, A. (2018). Sex and credit: Do gender interactions matter for credit market outcomes? *Journal of Banking & Finance*, *87*, 380–396.

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

Bellucci, A., Borisov, A., & Zazzaro, A. (2010). Does gender matter in bank–firm relationships? Evidence from small business lending. *Journal of Banking & Finance*, *34*(12), 2968–2984.

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

Bohren, J. A., Haggag, K., Imas, A., & Pope, D. G. (2023). Inaccurate statistical discrimination: An identification problem. *Review of Economics and Statistics (Forthcoming).*

Bowles, H. R., Babcock, L., & Lai, L. (2007). Social incentives for gender differences in the propensity to initiate negotiations: Sometimes it does hurt to ask. *Organizational Behavior and Human Decision Processes*, *103*(1), 84–103.

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

Calderón, G., Iacovone, L., & Juarez, L. (2017). Opportunity versus necessity: Understanding the heterogeneity of female micro-entrepreneurs. *World Bank Economic Review*, *30*, S86–S96.

Card, D., Cardoso, A. R., & Kline, P. (2015). Bargaining, sorting, and the gender wage gap: Quantifying the impact of firms on the relative pay of women. *Quarterly Journal of Economics*, *131*(2), 633–686.

Carpenter, R. E., & Petersen, B. C. (2002). Is the growth of small firms constrained by internal finance? *Review of Economics and Statistics*, *84*(2), 298–309.

Cohoon, J. M., Wadhwa, V., & Mitchell, L. (2010). *Are successful women entrepreneurs different from men?* Ewing Marion Kauffman Foundation.

Cole, S., Kanz, M., & Klapper, L. (2015). Incentivizing calculated risk-taking: Evidence from an experiment with commercial bank loan officers. *Journal of Finance*, *70*(2), 537–575.

Cooper, D. J., & Saral, K. J. (2020). The behavioral approach to entrepreneurship. In K. F. Zimmermann (Ed.), *Handbook of Labor, Human Resources and Population Economics* (pp. 1–25). Springer.

Croson, R., & Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature*, *47*(2), 448–74.

Demirguc-Kunt, A., Klapper, L., Singer, D., & Ansar, S. (2018). *The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution*. World Bank Publications.

Djankov, S., McLiesh, C., & Shleifer, A. (2007). Private credit in 129 countries. *Journal of Financial Economics*, *84*(2), 299–329.

Economist. (2022). *African startups are raising unprecedented amounts. What next?*

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

Fafchamps, M., & Woodruff, C. (2017). Identifying gazelles: Expert panels vs. surveys as a means to identify firms with rapid growth potential. *World Bank Economic Review*, *31*(3), 670–686.

Fisman, R., Paravisini, D., & Vig, V. (2017). Cultural proximity and loan outcomes. *American Economic Review*, *107*(2), 457–492.

Goldin, C. (2020). Journey across a century of women. *NBER Reporter*, *3*, 1–7.

Gonzales Martinez, R., Aguilera-Lizarazu, G., Rojas-Hosse, A., & Aranda Blanco, P. (2020). The interaction effect of gender and ethnicity in loan approval: A Bayesian estimation with data from a laboratory field experiment. *Review of Development Economics*, *24*(3), 726–749.

Guzman, J., & Kacperczyk, A. (2019). Gender gap in entrepreneurship. *Research Policy*, *48*(7), 1666–1680.

Hebert, C. (2020). Gender stereotypes and entrepreneur financing. *10th Miami Behavioral Finance Conference*.

Hsieh, C.-T., & Olken, B. A. (2014). The missing "missing middle". *Journal of Economic Perspectives*, *28*(3), 89–108.

IMF. (2021). *Financial Development Index Database*. International Monetary Fund.

Jaoui, F., Amoussou, O., & Kemeze, F. H. (2022). "Catch me if you can" on drivers of venture capital investment in Africa. *African Development Review*, *34*, S117–S140.

Kelley, D., Singer, S., & Herrington, M. (2016). *GEM 2015/2016 Global Report*. Global Entrepreneurship Monitor.

Lee, M., & Huang, L. (2018). Gender bias, social impact framing, and evaluation of entrepreneurial ventures. *Organization Science*, *29*(1), 1–16.

List, J. A. (2020). Non est disputandum de generalizability? A glimpse into the external validity trial. *NBER Working Paper No. 27535*.

Macchi, E. (2023). Worth your weight: Experimental evidence on the benefits of obesity in low-income countries. *American Economic Review*, *113*(9), 2287–2322.

Mascia, D. V., & Rossi, S. P. (2017). Is there a gender effect on the cost of bank financing? *Journal of Financial Stability*, *31*(100), 136–153.

McKenzie, D., & Sansone, D. (2019). Predicting entrepreneurial success is hard: Evidence from a business plan competition in Nigeria. *Journal of Development Economics*, *141*, 102369.

Montoya, A. M., Parrado, E., Solis, A., & Undurraga, R. (2020). Bad taste: Gender discrimination in the consumer credit market. *IDB Working Paper No. IDB-WP-1053*.

Morazzoni, M., & Sy, A. (2022). Female entrepreneurship, financial frictions and capital misallocation in the US. *Journal of Monetary Economics*, *129*, 93–118.

Muravyev, A., Talavera, O., & Schäfer, D. (2009). Entrepreneurs' gender and financial constraints: Evidence from international data. *Journal of Comparative Economics*, *37*(2), 270–286.

Niederle, M. (2016). Handbook of Experimental Economics. *Princeton University Press*, 481–553.

OECD. (2017). *The Pursuit of Gender Equality-An Uphill Battle.*

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

Scholz, E., Jutz, R., Edlund, J., Öun, I., & Braun, M. (2014). ISSP 2012 family and changing gender roles IV: Questionnaire development.

Staines, G. L., Tavris, C. A., & Jayaratne, T. E. (1974). The queen bee syndrome. *Psychology Today, 7*(8), 55–60.

Ulyssea, G. (2018). Firms, informality, and development: Theory and evidence from Brazil. *American Economic Review, 108*(8), 2015–47.

UNDP. (2022). *Human Development Report 2021-22*. United Nations Development Programme.

Younkin, P., & Kuppuswamy, V. (2018). The colorblind crowd? Founder race and performance in crowdfunding. *Management Science, 64*(7), 3269–3287.

Zhang, Y. (2023). Discrimination in the Venture Capital Industry: Evidence from Field Experiments. *Working Paper.*

A Appendix

A.1 Tables

Table A1: Founder and Implementer Names

Male	Female
Benjamin	Alinda
David	Carolin
Derrick	Dorothy
Duncan	Elisabeth
Kelvin	Esther
Martin	Juliana
Nicholus	Olivia
Ivan	Patience
Joel	Rebecca
Richard	Vanessa

Notes. Names used to signal the gender of founder and implementer.

Table A2: Balance Test

	Male Entrepreneur		Female Entrepreneur			
	Mean (1)	SD (2)	Mean (3)	SD (4)	Difference (5)	p-value (6)
Age	34.0	5.04	34.2	5.24	-0.15	0.75
Male	0.57	0.50	0.54	0.50	0.029	0.54
Experience	6.84	4.06	6.73	4.35	0.12	0.77

Notes. Comparison of loan officer characteristics who either saw the individual entrepreneur as being male or female. Column (1)-(4) show the mean and the standard deviation of the characteristics across both sample, Column (5) reports the difference between the means, Column (6) shows the p-value of a two-sample t-test.

Table A3: Investment and Best Business Decision with Individual Controls [Individual Entrepreneurs]

Panel A: Investment		Gender bias		LO gender		Experience	
		Low	High	Female	Male	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female Entrepreneur	-232.98**	-125.77	-384.55**	-284.84	-219.13	-270.68	-214.39
	(118.50)	(171.93)	(169.40)	(179.38)	(159.43)	(184.55)	(159.83)
Age	-7.57	1.63	-14.75	-40.78	13.12	27.47	-50.00**
	(17.12)	(22.47)	(26.62)	(25.64)	(21.52)	(22.92)	(23.11)
Experience	31.09	13.50	55.64*	66.88**	10.43	-20.91	88.01***
	(19.64)	(26.29)	(30.00)	(30.04)	(24.18)	(57.79)	(28.44)
Male	268.88**	140.92	292.43*			254.86	273.40*
	(120.70)	(179.65)	(162.14)			(178.97)	(164.08)
Mean Dep. Var.	3,490.7	3,342.1	3,656.9	3,333.3	3,609.8	3,442.7	3,529.2
Observations	451	234	217	201	250	199	252

Panel B: Best Business							
Female Entrepreneur	-0.07*	-0.04	-0.10*	-0.11*	-0.04	-0.14**	-0.04
	(0.04)	(0.05)	(0.05)	(0.06)	(0.05)	(0.06)	(0.05)
Age	0.00	0.01	-0.00	-0.01	0.01	0.00	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Experience	-0.01**	-0.02*	-0.01	0.00	-0.03***	-0.02	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Male	0.07*	0.01	0.11*			0.12*	0.05
	(0.04)	(0.06)	(0.05)			(0.06)	(0.05)
Mean Dep. Var.	0.26	0.25	0.27	0.24	0.28	0.33	0.21
Observations	451	234	217	201	250	199	252

Notes. OLS Regressions of the dependent variable *Investment* (Panel A) or *Best Business* (Panel B) on the gender of the individual entrepreneur who founded and implemented the business. Panel A reports the incentivized decision of how much to invest in the pitch deck business from 0-5,000 UGX. Panel B reports the incentivized decision of selecting the best business idea; it is a probability. Column (1) reports the average effect, and Columns (2)-(7) split the observations according to different relevant observable characteristics. Columns (2)-(3) split by gender bias following International Social Survey Programme gender bias metrics (see footnote 11). The sample is split at the median. (4)-(5) are split according to the self-reported gender of the respondent, and (6)-(7) are split according to the median experience level. *Mean Dep. Var* indicates the mean of the dependent variable of the reference group. Standard errors are heteroskedasticity-robust and reported in parentheses. The table includes pitch deck FE in both Panels. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A4: Accurate Participants [Individual Entrepreneurs]

	Investment	Best Business	Request Info	# Info	P[failure]	P[small profits]	P[large profits]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female Entrepreneur	-219.40*	-.06	.06	.02	2.98	-2.95	-.04
	(123.53)	(.04)	(.05)	(.14)	(2.32)	(2.28)	(2.69)
Mean Dep. Var.	3461	.25	.36	.69	24	41	35
Observations	410	410	410	410	410	410	410

Notes. OLS Regressions. The sample of accurate participants excludes the choices of ten percent of individuals who clicked most on the survey page when answering comprehension questions. The dependent variable is the gender of the individual entrepreneur who founded and implemented the business. *Mean Dep. Var* indicates the mean of the dependent variable of the reference group. The table includes round FE except for Columns (3) & (4). Standard errors are heteroskedasticity-robust and reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A5: Beliefs about Business Success [Individual Entrepreneurs]

	P[failure] (1)	P[small profits] (2)	P[large profits] (3)
Female Entrepreneur	4.081*	-2.858	-1.223
	(2.187)	(2.210)	(2.568)
Mean Dep. Var.	22.47	41.80	35.73
Observations	451	451	451

Notes. OLS Regressions of the probability of the realization of three different scenarios about the business success on the gender of the individual entrepreneur who founded and implemented the business. 100 points could be allocated among the three different scenarios. The question was phrased as follows: *What is the chance that this business idea will 1) fail within the first year, 2) survive the first year, but only make small profits, and 3) survive the first year and make large profits. Mean Dep. Var* indicates the mean of the dependent variable of the reference group. Standard errors are heteroskedasticity-robust and reported in parentheses. The table includes pitch deck FE in both Panels. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A6: Idea Quality [Individual Entrepreneurs]

	Idea Quality (0-100)				
	Round/Deck 1 (1)	Round/Deck 2 (2)	Round/Deck 3 (3)	Round/Deck 4 (4)	Round/Deck 5 (5)
Female Founder	.6	-1.8	-4.9	4.6	-6.2
	(4.1)	(5.2)	(4.8)	(4.0)	(3.9)
Mean Dep. Var.	69.12	63.30	71.05	74.05	75.85
Observations	86	81	92	85	107

Notes. OLS regressions of the perceived quality of the business ideas on the gender of the individual entrepreneur who founded and implemented the business. The index is based on two questions: *1) Does this business idea meet a need or solve a problem in Uganda?* and *2) Is there a market for this business idea in Uganda?* Participants rated their agreement on a scale ranging from 0 (*completely disagree*) to 100 (*completely agree*). *Mean Dep. Var* indicates the mean of the dependent variable of the reference group. Standard errors are heteroskedasticity-robust and reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A7: Correlations of Business Evaluation Measures [Individual Entrepreneurs]

	Investment (1)	Best Business (2)	Idea Quality (3)	P[failure] (4)	P[large profits] (5)
Investment	1.00				
Best Business	0.26***	1.00			
Idea Quality	0.52***	0.27***	1.00		
P[failure]	−0.38 ***	−0.16 ***	−0.46 ***	1.00	
P[large profits]	0.32***	0.20***	0.38***	−0.57 ***	1.00

Notes. Pearson correlation coefficients *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A8: Investment and Best Business: Alternative Gender Bias Measure

Panel A: Individuals	Investment		Best Business	
	Low Bias (1)	High Bias (2)	Low Bias (3)	High Bias (4)
Female Entrepreneur	-111.78	-386.84**	-0.05	-0.10*
	(169.41)	(169.07)	(0.05)	(0.05)
Mean Dep. Var.	3,305.2	3,443.2	0.3	0.2
Observations	231	220	231	220
Panel B: Teams				
Female Founder	-133.02	145.95	-0.04	0.02
	(118.14)	(125.19)	(0.04)	(0.04)
Female Implementer	-141.99	23.03	-0.03	-0.01
	(126.86)	(107.47)	(0.04)	(0.04)
Female Founder&Implementer	142.53	-60.65	0.13**	0.04
	(178.27)	(160.70)	(0.06)	(0.06)
Mean Dep. Var.	3,238.64	3,398.30	0.19	0.19
Observations	924	880	924	880

Notes. OLS Regressions of the dependent variable *Investment* or *Best Business* on the gender of the individual entrepreneur who founded and implemented the business (Panel A) or on the gender of the founder and the implementer in teams (Panel B). *Investment* is the incentivized decision of how much to invest in the pitch deck business from 0-5,000 UGX. *Best Business* is the incentivized decision of selecting the best business idea; it is a probability. The table splits the sample by gender bias following International Social Survey Programme gender bias metrics (see footnote 11). The adjusted gender bias measure in this table only uses the following two questions questions: *A man's job is to earn money; a woman's job is to look after the home and family* and *a job is alright, but what most women really want is home and children*. The sample is split at the median. *Mean Dep. Var* indicates the mean of the dependent variable of the reference group. Standard errors are heteroskedasticity-robust in Panel A, clustered at the individual level in Panel B, and reported in parentheses. The table includes pitch deck FE in both Panels, Panel B additionally includes individual FE. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A9: Investment Decision - Pre-Analysis Plan [Teams of Entrepreneurs]

Panel A: Investment		Gender bias		LO gender		Experience	
		Low	High	Female	Male	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female Founder	27.60	-109.48	174.52*	19.89	30.41	-16.01	67.55
	(65.54)	(94.83)	(90.36)	(91.32)	(92.29)	(96.56)	(89.15)
Female Implementer	-40.00	-30.97	-53.75	-88.76	-6.71	-68.52	-9.83
	(56.55)	(80.97)	(78.94)	(86.33)	(74.21)	(80.70)	(79.12)
Mean Dep. Var.	3,352.2	3,395.6	3,308.3	3,353.5	3,351.2	3,303.0	3,393.4
F-Statistic	.018	1.1	.92	.28	.033	.43	.2
P-value	.89	.31	.34	.6	.85	.51	.66
Observations	1804	936	868	804	1000	796	1008

Panel B: Best Business							
Female Founder	0.03	0.00	0.06**	0.04	0.03	0.04	0.03
	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Female Implementer	0.02	0.02	0.01	-0.00	0.03	-0.02	0.05*
	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Mean Dep. Var.	0.21	0.23	0.18	0.27	0.16	0.21	0.21
F-Statistic	2.3	.24	2.4	.37	2.2	.16	2.8
P-value	.13	.62	.12	.54	.14	.69	.093
Observations	1804	936	868	804	1000	796	1008

*Notes.*OLS Regressions of the dependent variable *Investment* (Panel A) or *Best Business* (Panel B) on the gender of the founder and the implementer in teams. Panel A reports the incentivized decision of how much to invest in the pitch deck business from 0-5,000 UGX. Panel B reports the incentivized decision of selecting the best business idea; it is a probability. Column (1) reports the average effect, and Columns (2)-(7) split the observations according to different relevant observable characteristics. (2)-(3) split by gender bias following International Social Survey Programme gender bias metrics (see footnote 11). The sample is split at the median. (4)-(5) are split according to the self-reported gender of the respondent, and (6)-(7) are split according to the median experience level. *Mean Dep. Var* indicates the mean of the dependent variable of the reference group. Standard errors are clustered at the individual level and reported in parentheses. The table includes pitch deck and individual FE in Panel A and pitch deck FE in Panel B. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A10: Correlations of Business Evaluation Measures [Teams of Entrepreneurs]

	Investment (1)	Best Business (2)	Idea Quality (3)	P[failure] (4)	P[large profits] (5)
Investment	1.00				
Best Business	0.18***	1.00			
Idea Quality	0.51***	0.21***	1.00		
P[failure]	−0.32 ***	−0.17 ***	−0.42 ***	1.00	
P[large profits]	0.33***	0.22***	0.37***	−0.61 ***	1.00

Notes. Pearson correlation coefficients *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A11: Investment Decision by Round [Teams of Entrepreneurs]

	Investment into Business (0-5,000 UGX)				
	Round/Deck 1 (1)	Round/Deck 2 (2)	Round/Deck 3 (3)	Round/Deck 4 (4)	Round/Deck 5 (5)
Female Founder	-209.6	-181.8	16.5	141.4	266.8
	(188.5)	(245.5)	(182.6)	(194.4)	(189.7)
Female Implementer	-257.7	-74.1	90.2	-116.3	64.2
	(177.1)	(230.2)	(181.1)	(191.2)	(184.8)
Female Founder&Implementer	228.8	3.5	62.4	141.2	-320.4
	(274.6)	(307.1)	(269.5)	(278.2)	(286.5)
Mean Dep. Var.	3,423.1	3,192.3	3,308.2	3,413.0	3,358.2
Indiv. FE	No	No	No	No	No
Indiv. Controls	No	No	No	Yes	No
Round FE	No	No	No	No	No
Observations	365	370	359	366	344

Notes. OLS Regressions of the five different investment decisions on the gender of the founder and the implementer in teams in which these are different individuals. *Mean Dep. Var* indicates the mean of the dependent variable of the reference group. Standard errors are heteroskedasticity-robust and reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A12: Accurate Participants [Teams of Entrepreneurs]

|	Investment (1)	Best Business (2)	Request Info (3)	# Info (4)	P[failure] (5)	P[small profits] (6)	P[large profits] (7)
Female Founder	1.62	-.02	.11	.27	-.01	1.87	-1.86
	(90.72)	(.03)	(.07)	(.24)	(1.64)	(1.58)	(1.81)
Female Implementer	-69.31	-.02	.03	-.13	-1.30	4.24***	-2.94
	(87.92)	(.03)	(.07)	(.19)	(1.53)	(1.57)	(1.88)
Female Founder&Implementer	53.40	.08*	-.03	.06	-.88	-4.14*	5.02*
	(127.08)	(.04)	(.11)	(.32)	(2.21)	(2.20)	(2.80)
Mean Dep. Var.	3321	.21	.4	.75	26	37	37
F-Statistic	.021	1.4	2	.65	1.6	1.2	.011
P-value	.89	.24	.16	.42	.2	.27	.92
Observations	1640	1640	332	332	1640	1640	1640

Notes. OLS Regressions. The sample of attentive participants excludes the choices of ten percent of individuals who clicked most on the survey page when answering comprehension questions. The dependent variable is the gender of the founder and the implementer in teams. *Mean Dep. Var* indicates the mean of the dependent variable of the reference group. The table includes round FE, individual FE and standard errors clustered at the individual level in Columns (1) & (5)-(7). Column (2) includes round FE and standard errors clustered at the individual level. Columns (2) & (3) do not include any FE, but heteroskedasticity-robust standard errors. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A13: Beliefs about Business Success [Teams of Entrepreneurs]

	P[failure] (1)	P[small profits] (2)	P[large profits] (3)
Female Founder	.240	.958	-1.198
	(1.394)	(1.377)	(1.633)
Female Implementer	-.398	2.084	-1.686
	(1.337)	(1.407)	(1.634)
Female Founder&Implementer	-1.572	-1.563	3.135
	(1.997)	(2.001)	(2.474)
Mean Dep. Var.	25.16	38.51	36.33
Observations	1804	1804	1804

Notes. OLS Regressions of the probability of the realization of three different scenarios about the business success on the gender of the founder and the implementer in teams in which these are different individuals. 100 points could be allocated among the three different scenarios. The question was phrased as follows: *What is the chance that this business idea will 1) fail within the first year, 2) survive the first year, but only make small profits, and 3) survive the first year and make large profits. Mean Dep. Var* indicates the mean of the dependent variable of the reference group. Standard errors clustered at the individual level. The table includes round FE. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
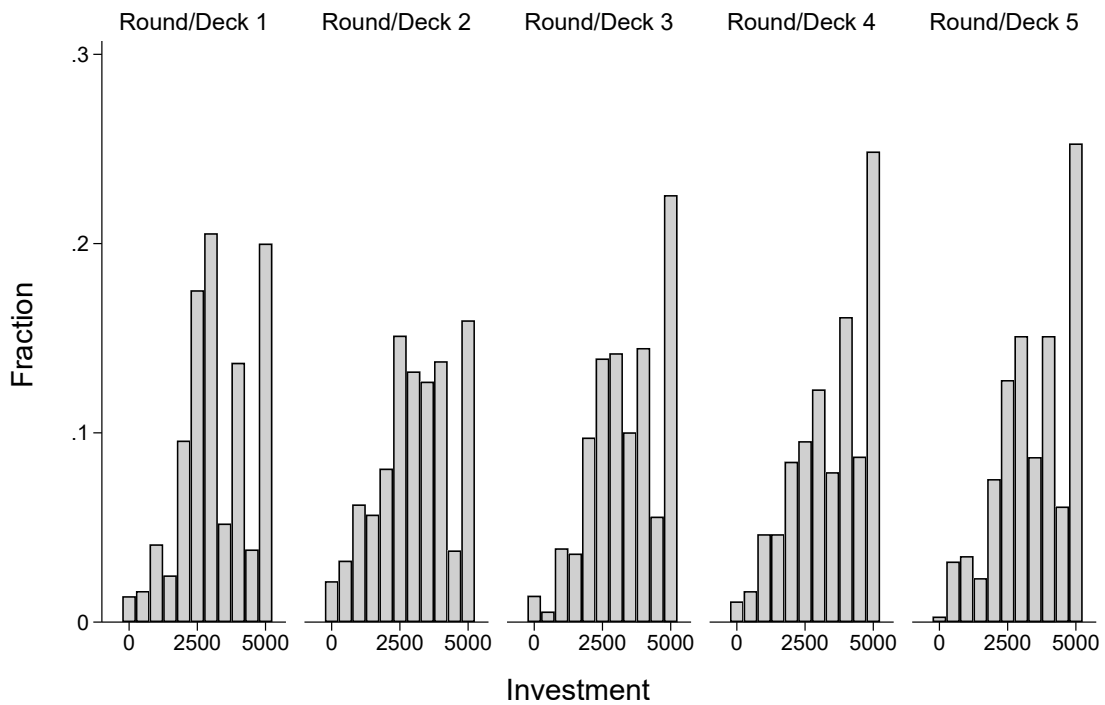
A.2 Figures
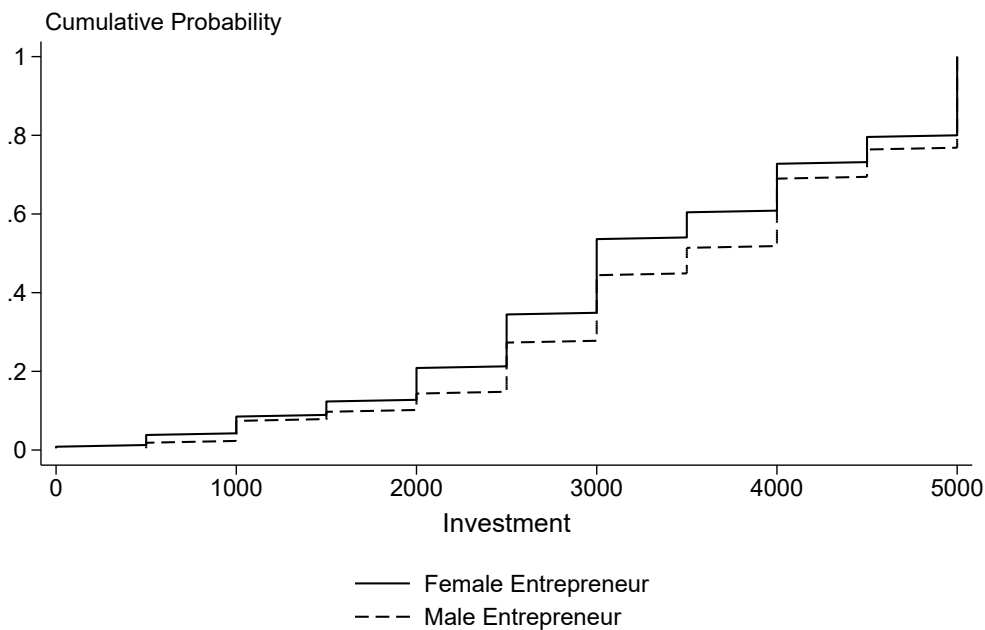
Notes. This figure the cumulative distribution functions of the invested amount into businesses of individual female or male entrepreneurs.

Figure A1: Distribution Investment [Individual Entrepreneurs]
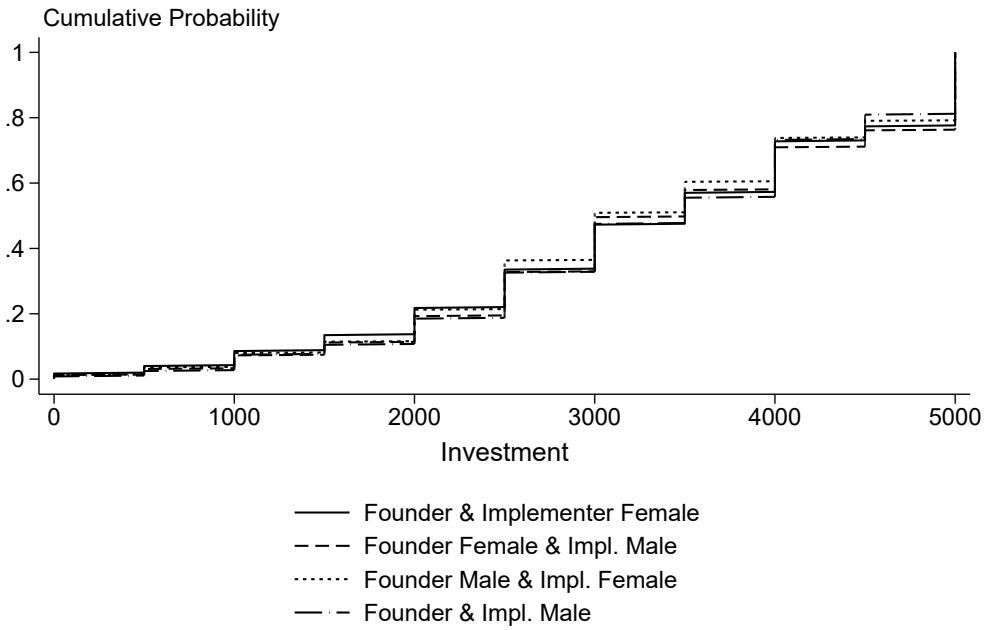
Cumulative Probability

— Founder & Implementer Female
− − − Founder Female & Impl. Male
······· Founder Male & Impl. Female
— · − Founder & Impl. Male

Notes. This figure the cumulative distribution functions of the invested amount into businesses of entrepreneurial teams with varying gender of the founder and implementer.

Figure A2: Distribution Investment [Teams of Entrepreneurs]

Notes. This figure shows individual histograms for the invested amount into each of the pitch decks for the sample of entrepreneurial teams.

Figure A3: Investment across Rounds/Pitch Decks [Teams of Entrepreneurs]

A.3 Introduction to the Study and Informed Consent

In this section, we provide an overview of the introductory session that facilitators delivered to participants prior to the actual study. After an introduction from the branch manager, the facilitator outlined the study's objectives: to evaluate five start-up businesses and to express their own opinions. We did not disclose our interest in gender differences in these evaluations.

We familiarized the participants with the questionnaire's structure using flip charts. We visually illustrated the survey procedures and the structure of incentives as outlined in detail in Section A.4. We used enhanced graphical illustration to explain the investment decisions and the resulting payouts depending on real-life business survival. Further, we provided technical instructions, such as how to operate a slider. All clarifying questions were answered.

Investment Graphical Depiction

All participants gave their informed consent. Participants were informed that their participation is voluntary, and they have the right to withdraw at any point without facing any negative consequences.

Following the introduction, participants proceeded to their workstations to take the survey, see Section A.4. The facilitators were present throughout the experimental session to resolve any comprehension questions or technical issues during the study.

A.4 Survey

In this subsection, we present a summary of the survey's structure. The survey was administered using the software Qualtrics.[18]

---

[18]https://www.qualtrics.com/

Instructions and Comprehension Check

At their workstation, participants need to answer two comprehension questions to evaluate their understanding of the incentivized investment questions before they can proceed with the survey. The comprehension questions are as follows:

1. *Imagine that you invest 2,500 UGX to the business and keep 2,500 UGX. The business reported that it still exists and makes profits. How much do you have in total?*
2. *Imagine that you invest 4,000 UGX to the business and keep 1,000 UGX. The business reported that it does not exist anymore. How much will you have in total?*

These questions are crucial to ensure that participants have understood the investment decisions they are about to take and that were presented to them during the introduction of the study.

Pitch Deck Presentation

Each pitch deck is presented in the following way. First, the name of the business idea and the identity of the **founder** associated with it are presented. According to the experimental design, the name of the founder is randomly varied while all other information remains constant for each loan officer.

Green Market is a business idea originated by **{Name}** during the entrepreneurship academy.

{Name} is 24 years old and has a bachelor's degree in business administration and information technologies. **{Name}** did an internship at an agribusiness for six months.

In the next pages, you will able to see the idea of **{Name}** presented at the end of the entrepreneurship academy.

Take your time to go over **{Name}** 's idea.

Founder Description

After the description of the founder, the pitch deck detailing the business idea is presented. Below is the first business idea, *Green Market.*

Green Market
Promoting agriculture through bringing Market closer to farmers

1

Problem

Inadequate ready market for agricultural produce, inputs

2

Solution

A platform where farmers connect directly with the buyers

3

Unique Value Proposition

- **Affordability**
- **Farmers can advertise products they are intending to sell**
- **Buyers are given a chance to demand**
- **Access anytime of your convenience**
- **User friendly**

4

Revenue Model

- **Buyers and sellers who connect pay a monthly subscription fee of 5,000 UGX each**
- **Farmers pay for advertising their product on the platform. Advertising fee is 10,000 UGX for 30 days**

5

Status quo and Accomplishment

- **We are still at our initial stage and so far reached 3 customers**
- **We look forward to reach 100 customers in near future**

6

After reviewing the business idea, participants are asked to evaluate the idea quality subjectively. These measures are not incentivized: *Please rate your level of agreement from 0-100 with the following statements:*

1. *This business idea meets a need or solves a problem in Uganda.*
2. *There is a market for this business idea in Uganda.*

Subsequently, the **implementer** of the idea is presented similarly to the founder. For instance, for the business idea *Green Market*, the implementer's information reads as follows:

The candidate to implement this idea is {Name}. {Name} is 25 years old and holds a degree in business administration and information technologies. {Name} also participated in entrepreneurship academies and completed a semester-long internship at a farming enterprise.

Participants proceed to the questions related to the pitch deck after reviewing the information of the implementer.

Manipulation and Attention Check

Before proceeding to the main survey questions, we check that participants know the gender of the founder and the implementer. The question includes three potential answers, with only one of them being correct. This verifies that participants picked up our gender manipulation.

Before we do that, we just want to check what you remember about the description of Green Market. Which statement is true?

Green Market
Promoting agriculture through bringing Market closer to farmers
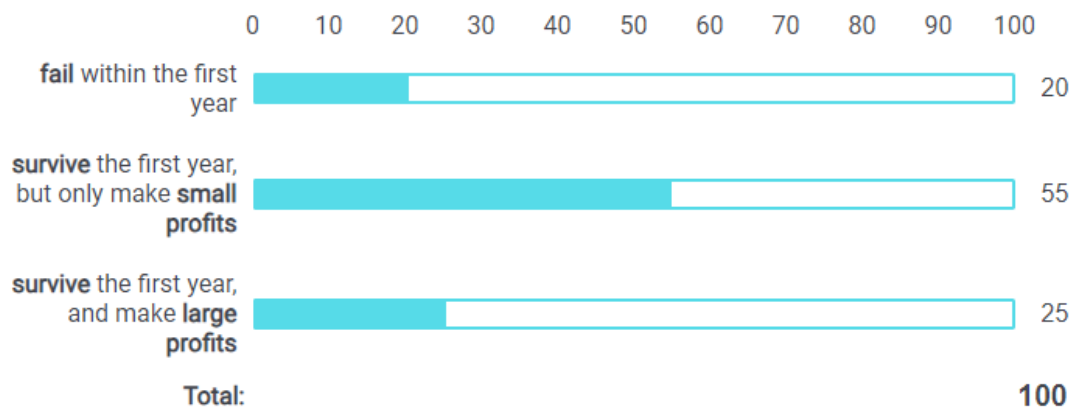
Business idea originated by: **{Name}**
Implemented by: **{Name}**

{Name}   came up with the idea of Green Market during an entrepreneurship academy.

Green Market was not implemented by {Name}

Green market is a company that focuses on production of renewable electricity.

## Probabilistic Beliefs about Business Success

The first set of questions asks participants to estimate the likelihood of three different types of business outcomes.

What is the chance that this business idea will...

	0 10 20 30 40 50 60 70 80 90 100	
fail within the first year		20
survive the first year, but only make **small** profits		55
survive the first year, and make **large** profits		25
Total:		**100**

Investment

In this question, participants determine the amount they want to invest in the business, ranging from 0 to 5,000 UGX. They see a slider on the screen to facilitate their decision-making process.

I choose to invest:

| 0 | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 |

UGX
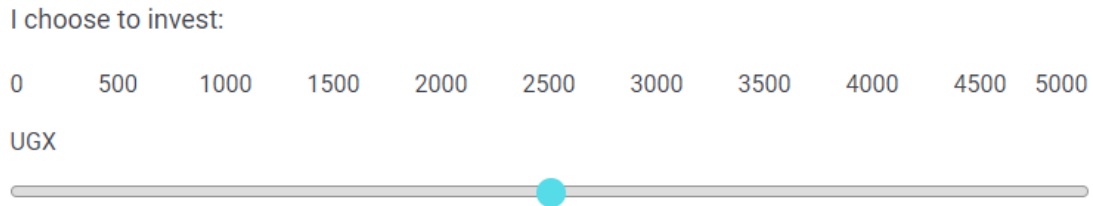
Sequence of Pitch Decks

In total, participants see five pitch decks. This means that the sequence from "Pitch Deck Presentation" to this point is repeated five times, once for each pitch deck.

Information Request

Participants can revise the amount they initially decided to invest in the business that was selected to be payoff-relevant. For this, they can request additional information. Participants are informed about this in the following way:

Uni Chaps was chosen as the business for which the investment decision will determine the potential bonus. You previously decided to invest {amount} UGX in this business. We would like to offer you the chance to revise your investment. To make an informed decision, you have the option to obtain additional information about Uni Chaps. However, it is essential to note that acquiring and verifying this information incurs a cost. Just as in your job, gathering and assessing information about a borrower's business entails costs, such as the time spent on this task.

1. *Yes, I want to check which additional information is available.*
2. *No, I will revise my investment decision without additional information.*

If the participant selects 'Yes', the available information and its associated cost are explained as follows:

Each piece of additional information, if available, costs 200 UGX. If you choose to access a particular piece of information, we will deduct 200 UGX from your final payoff. Conversely, if the requested information is not available, there will be no charge, and your payoff will not be affected.

Participants are provided with a clear understanding of the cost implication associated with acquiring additional information, enabling them to make an informed decision on whether to proceed with obtaining the information or not.

Which additional pieces of information would you like to have about Uni Chaps? (select as many as you would like)

All team members owning the business

Professional references for business owners

Professional experience of the business owners

Professional network of the creators

Financial support from family members this business has received

External financing obtained

Volume of sales, revenues, and profit margins

None of the above, I wanted to obtain some other type of information

If the participant selects 'No', they have the opportunity to revise their investment without seeing which pieces of information may be available.

Best Performing Business

In this question, participants select the business that they think is the most profitable of the five presented businesses:

Which business do you think was generating the highest profits when we last contacted them? If you guess correctly, you will earn an additional 5,000 UGX bonus. However, if your guess is incorrect, you will not receive any bonus.

Participants are incentivized to make an accurate prediction, as a correct choice will result in a bonus reward.

Gender Norms

Participants are asked to indicate their level of agreement with the following statements using a 5-point Likert scale:

(a) *A man's job is to earn money; a woman's job is to look after the home and family.*
(b) *Family life suffers when the woman has a full-time job.*
(c) *A job is all right, but what most women really want is a home and children.*

Demographics

The survey concludes with three demographic questions:

1. *How old are you?*

2. *What is your gender? (Male / Female / Other)*
3. *How long have you been a loan officer?*

A.5   Deviations from the Pre-Analysis Plan

1. Our main specification was based on the assumption that there are no significant interaction effects between the gender of the founder and the gender of the implementer. Since this turned out not to be true (see e.g., Table 3), we rely on the secondary specification of the pre-analysis plan, which relaxed this assumption. However, we also present the results with the main specification of the PAP which only includes only dummies for the gender of the founder and implementer (but not the interaction), in Appendix Table A9.

2. We do not split results by loan officer performance/productivity metrics because our partner was only able to provide these for about 50 percent of our sample (225 out of 451 loan officers).