

Incentivizing Lending to Women Entrepreneurs: Evidence from Vietnam

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Abstract

This study evaluates an initiative to address the gender gap in access to finance, by targeting lending agents. In collaboration with a leading Vietnamese commercial bank, we implement and measure the impact of two types of incentives for lending agents on recruitment of women-owned or -led small- and medium-sized enterprises (WSMEs) as new borrowing clients. The study involves two successive phases, during each of which 50 branches employing 550 lending staff are randomly assigned to one of the following treatments: (1) a monthly multi-category contest; (2) piece-rate incentives; or (3) control. The multi-category contest rewards not just top performing agents, but also top new performers, and most improved performers. Our main outcomes of interest are new WSME borrowers at the individual and branch levels. Secondary outcomes include overall lending volumes, composition of the lending portfolio, and behavioral changes by lending agents.

Keywords: WSME finance, banking, incentive design, financial inclusion, randomized controlled trial, Vietnam

JEL codes: O16, G21, J16, O12.

Study pre-registration: AEA RCT Registry, AEARCTR-0011576,
<https://www.socialscienceregistry.org/trials/11576>

Proposed timeline

The study interventions will begin on July 3, 2023 and end on July 31, 2024. Midline surveys were collected in December, 2023, and endline surveys will be collected in August, 2024. Administrative data acquisition will be ongoing until September, 2025.

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1. Introduction

Research question: background, importance and relevance

It has been estimated that micro, small and medium enterprises in emerging markets face a \$5.2 trillion USD annual financing gap, with \$1.5 trillion attributed to women entrepreneurs (Bruhn et al 2017). In Vietnam, in particular, women owned and operated small- and medium-sized enterprises (WSMEs) have been estimated to face a \$1.19 billion USD annual financing gap (IFC 2017). Only 37% of WSMEs had received bank loans in the preceding two years, compared to 47% of male-owned SMEs, and—even when they qualified—WSMEs tended to receive less than what they asked for and in lower amounts than men (IFC 2017).

Increasing access to finance for WSMEs has the potential to reduce credit constraints and promote firm growth, which can improve outcomes for employees and consumers and empower women entrepreneurs. Given the evidence that misallocation of capital is particularly prevalent in emerging economies (Hsieh and Klenow, 2009), redirecting it toward WSMEs could also promote economic growth through targeting an underserved lending segment. Finally, individual banks that lead in overcoming this inefficiency in lending markets could enjoy a competitive advantage. As such, identifying organizational policy innovations that can sustainably reduce potentially inefficient discrimination in the banking system against WSMEs and precisely measuring their impact is clearly important for the field of development economics.

Lending agents are the primary bank representatives who reach out to prospective new borrowers. But how can these agents be incentivized to maximize their support for a strategic bank goal of increasing lending to WSMEs? A large literature has already broadly examined different incentive schemes for motivating employee productivity and performance (as reviewed by, e.g., Baker et al 1988; Prendergast 1999). However, existing work does not yet provide clear guidance on which incentive design would be most effective in our context, which involves seeking to address gender inequality in access to bank loans in a developing country bank.

In this study, we measure the impact of real-stakes financial incentives that explicitly reward recruitment of new WSME borrowers by the lending agents of a large commercial bank in Vietnam. Specifically, we implement a randomized controlled trial (RCT) that compares the impact of: (1) bonus incentives from a monthly multi-category contest for the highest number of new WSME borrowers (henceforth the contest treatment), (2) bonus incentives from a piece-rate incentive per new WSME loan (henceforth the piece-rate treatment), and (3) a control.² The contest is designed to be more inclusive than a simple “winner-take-all” contest, by awarding prizes not just to top overall performers, but also the best-performing new agents (agents hired in last 12 months), and agents with little recent success in WSME lending (agents with at least 12 months of experience and two WSME loans or less in the previous 12 months). The piece-rate incentive pays agents a fixed amount per new WSME loan. The two programs’ budgets have been calibrated to make the funds available in each treatment arm as equal as possible.

² In our partner bank, agents receive about 50% of income in terms of fixed salary, about 25% of income from core Key Performance Indicators at the bank (e.g., portfolio growth and quality), which are not linked to clients’ gender, and about 25% from special bonus and incentive programs, such as ours. Hence our intervention is not an overwhelming portion of agents’ incomes, and agents continue to have incentives to pursue objectives relevant to the bank, e.g., portfolio quality.

Our two treatments represent two levels of between-colleague competition, with the contest treatment representing stronger competition and the piece-rate treatment representing weaker competition. To isolate the effect of structuring incentives at these two different levels of competition from the benefits of social recognition, information disclosure about lending performance will be balanced between the two treatment arms. Managers in both treatment arms are also eligible for identical sets of competitive quarterly prizes for top branch-level numbers of new WSME borrowers in both treatment arms. Unlike agent performance, however, these manager prizes will not be announced publicly. All of this is meant to keep the focus of our analysis on comparison of the differing levels of inter-agent competition between our two treatments.

Each approach has been shown to have its pros and cons in prior literature, with a key difference between the two being the greater role of competition between agents in contests. While this greater level of competition can stimulate effort and performance, it can also create excessive stress and discourage cooperation between agents towards shared organizational goals. Agents competing in contests may also lose the sense that they have a realistic chance to win and subsequently reduce their efforts—or even disengage entirely. Our multi-category contest design aims to reduce some of the downsides of competition, while maintaining the upside. Meanwhile, piece rates from an unlimited award pool remove the zero-sum nature of competition between agents and with it some of both the benefits and downsides of contests. The impact of greater competition may also vary with cultural context (e.g., national, provincial, or even branch level), individual characteristics (e.g., gender), or the types of individuals in Vietnam who choose to work as bank lending agents.

Our design randomizes assignment of the two treatments and control across 50 branches, which are stratified into two groups: 13 larger branches based in urban commercial centers (henceforth referred to as urban branches or Group 1) and 37 smaller branches spread across the rest of the country (henceforth referred to as provincial branches or Group 2).³ In the contest treatment all eligible lending agents in each group are eligible for that group's prizes, e.g., 4 of 13 urban branches in Group 1 are assigned to the contest treatment, meaning that all agents within these 4 branches compete with each other for the monthly prizes. Since there is significant heterogeneity between the provincial branches, to level the playing field we adjust contest scores in Group 2 by a provincial index that we create based on the proportion of women entrepreneurs in the branch's province (according to the 2020 Vietnam Enterprise Census produced by the Vietnamese government's General Statistics Office). This index will also be used to adjust numbers for manager prizes in Group 2.

The overall intervention period of our study will run for 12 months, in two 6-month phases (July to December, 2023, and February to July, 2024), according to the incentive design described later in this document. Outcomes will be measured through both administrative data from the partner commercial bank and data from baseline, midline, and endline surveys of all eligible lending agents and their managers. Surveys are

³ Technically, our study is focused exclusively on our partner bank's lending to its relatively smaller category of SMEs. In particular, the bank divides SMEs between those at and above 60 billion VND (about 2.6 million USD) in annual revenue and those below this cutoff. Our focus is firms in the below category. The upper limit on collateralized loan sizes for this category of SMEs is 25 billion VND (about 1.1 million USD), but it ultimately depends on what specific collateral they provide. In practice, the average collateralized loans for these firms are around 3-5 billion VND (about 120,000-210,000 USD). The upper limit on uncollateralized loans (i.e., cash flow-based lending), in turn, is 1.5 billion VND (about 65,000 USD). In practice, the average uncollateralized loan for our focal firms is around 300-500 million VND (about 12,000-20,000 USD). Ten of our Group 1 branches engage exclusively in lending to these smaller SMEs. The 3 others in Group 1 and all 37 in Group 2 also engage in lending to the larger category of SMEs. We do not refer to this size constraint elsewhere in this document.

conducted by video and phone, and the baseline survey is augmented with an online survey with two modules intended to measure gender attitudes and implicit bias. Because there is a degree of staff turnover, particularly in the agent cohort, we will continue to survey relevant new staff as they join the bank on a “rolling” basis throughout 2023 and 2024, and then include them in the midline and endline surveys whenever possible.

Analysis will be conducted at both the branch- and lending agent-levels. Our main outcome is the number of new WSME borrowing clients each month, specifically for secured (i.e., collateralized), unsecured, and overdraft loans.⁴ Secondary outcomes include loan applications, lending volumes, and measures of portfolio composition, e.g., whether the incentive program draws in a client base with a different distribution of characteristics and whether the presence of the incentive program positively or negatively affects sales of other products (e.g., lending to male SMEs, or other products such as accounts or credit cards). All of these outcomes will be measured with administrative data. Our implicit “first stage” outcomes include measures of lending agent attitudes (e.g., gender bias) and behavior (e.g., lending strategies,⁵ time spent on WSME lending), which will be measured through the lower-frequency surveys (baseline, midline, endline).

We aim to mitigate some of the downsides of competition within winner-take-all contests through three aspects of our contest design. First, our inclusive contest design involves three prize categories, allowing lending agents with less previous experience and success in bringing in WSME borrowers to compete against similar others. Second, competition is between agents across multiple branches, not just a focal agent’s own branch, which may reduce concerns that the contest could reduce cooperation between staff within branches. Third, we attempt to calibrate the prize amounts and number of prizes to not lead to excessive distortions in pay. Dividing the contest by months rather than longer time periods also keeps the stakes lower and keeps re-engaging participants by restarting the count from zero in each month.

Key Intended Contributions

The proposed study aims to make at least three contributions to the literature.

First, it would contribute to the literature on optimal incentive pay for lending agents in financial institutions. While much of the early literature on incentive pay in financial institutions focused on senior management such as CEOs, a growing literature explores incentives for lending agents, highlighting how badly designed incentives can lead to suboptimal outcomes in advanced and emerging economies. Literature using European and US data shows how performance pay can lead to distortions such as making loan officers over-attentive to incentive targets and ignoring activities in the interest of the bank (Behr et al 2020; Agarwal and Ben-David 2014; Efung et al 2015). There is also a small field experimental literature on performance pay in this context. Working with a US bank, Agarwal and Ben-David (2018) show that incentivizing originated loan volume causes a large increase in origination, but also in default, seemingly because greater

⁴ We exclude other credit products such as credit cards, from eligibility.

⁵ For example, perhaps lending agents find it easier to approach male entrepreneurs through existing client networks, as males tend to be the majority of the client base for most banks in countries such as Vietnam. Perhaps women entrepreneurs require different sales strategies, and it is costly and uncertain for agents to learn and master such strategies, while our incentives might encourage them to do so.

weight is put on hard rather than soft information. Berg et al (2020) echoes this finding. In the emerging market setting, Cole et al (2015) conduct a large framed field experiment in an Indian bank that varies the extent of high-powered incentives, limited liability, and deferred compensation for small business loan assessment. They find that limited liability and deferred compensation can offset the beneficial effects of high-powered incentives on screening effort and lending profitability. Rigol and Roth (2021) show how misaligned incentives for microfinance loan officers induces them to prevent their best clients from “graduating” to larger loan amounts. An emerging strand of literature also focuses on information concerns, e.g., Qian et al (2015) leverage quasi-experimental variation from a trade agreement to show how empowering loan officers can lead to beneficial lending outcomes in a Chinese bank, while Deserranno et al (forthcoming) conduct a field experiment with a large Indonesian bank, showing how informing clients about performance pay of banking agents can temper demand for financial products. Our study would contribute to this literature by providing new real stakes, field experimental evidence on incentivizes for lending to larger, growth-oriented enterprises. It would do so by comparing a performance pay mechanism (piece rate) to a social incentive mechanism (contest).

Second, the study would contribute to the emerging literature on gender and lending. One strand of this literature focuses on the gender of the borrower. An earlier literature on capital shocks for microenterprises in developing countries (e.g., de Mel et al 2008) purports to show that women entrepreneurs have lower returns to capital. However Bernhardt et al (2019) reconcile this puzzle by reanalyzing the data from a number of previous experimental studies, showing that women entrepreneurs often pass through capital from microloans and grants to other (typically male-owned) household enterprises. Other literature attempts to quantify discrimination toward female entrepreneurs. Hebert (2020) uses administrative data on the population of startups in France, showing that female-founded startups are 18% less likely to receive external equity including venture capital, overall. However there appears to be heterogeneity by sector: the gender funding gap reverses in female-dominated sectors, suggesting the possibility of context-dependent stereotypes on the part of loan officers. In the emerging economy setting, Brock and De Haas (2023) conduct a lab-in-field experiment with 334 Turkish loan officers, presenting them with real-life loan applications where only the gender of the applicant is randomly varied. While provisional loan approval rates are the same for male and female applicants, loan officers are 30% more likely to make approval conditional on the presence of a guarantor when the applicant is female. This discrimination is concentrated among young, inexperienced, and gender-biased loan officers. Our study would contribute to the borrower-focused literature on gender in lending both by evaluating an organizational intervention in a bank that aims to increase lending to growth-oriented, women entrepreneurs⁶ and by studying heterogeneity in lending outcomes based on baseline gender attitudes of lending agents—each in the context of a real-stakes field experiment.

There is less evidence on the gender of the lending agent. Papers such as Drexler and Schoar (2014) and Fisman et al (2017) show how relationship-specific knowledge and cultural affiliation between lending agents and their clients can matter for lending outcomes, generally in positive ways, though they don’t particularly focus on the dimension of gender. Our study would contribute to the scant evidence on lending agent gender by analyzing heterogeneity in treatment impacts along the dimension of lending agent gender.

Finally, the study would contribute to a broader literature in economics on optimal incentive contract design, and particularly the question of whether piece rate-based performance pay or a contest mechanism would

⁶ This complements papers such as Herbert and Toth (2023), which consider lending innovations that lower barriers to bank financing for WSMEs.

perform better. A large literature considers similar incentive design issues, primarily based on lab experiments (as reviewed by, e.g., Charness and Kuhn 2011; Dechenaux et al 2015). This literature, and earlier theoretical literature (e.g., Nalebuff and Stiglitz 1983), tends to find that piece rate incentives are more effective for simple and repetitive tasks, where there is a relatively tight connection between effort and output, while competitive incentives such as contests and tournaments can be more effective when there is greater task autonomy and uncertainty. However, there is relatively less evidence from real-stakes, field settings. Bandiera et al (2005) implement a field experiment in the UK comparing piece rates to relative incentives where a worker's effort can have negative externalities on the earnings of others, finding that piece rates perform much better than relative incentives because workers at least partially internalize this negative externality, though they only do so when aware of others' performance. Breza et al (2018) conduct a field experiment with Indian manufacturing workers, comparing flat wages to rank-based incentives, showing that the latter can cause reduced output due to lower cooperation, particularly when performance is harder to perceive. Our study would contribute to this literature by providing real-stakes, field experimental evidence on two different incentive mechanisms regarding a relatively high-stakes, uncertain, autonomous task and by focusing on an organizational goal of overcoming the inefficiencies of gender bias.

2. Research Design

Hypotheses

Our main hypotheses are as follows:

- **Hypothesis 1a:** The multi-category contest intervention will cause an increase in the number of new WSME borrowers, at both the branch and lending agent levels.
- **Hypothesis 1b:** The piece-rate incentives intervention will cause an increase in the number of new WSME borrowers, at both the branch and lending agent levels.

Reasoning: we believe that both sets of incentives are well-calibrated in magnitude and sufficiently inclusive that they should outperform a counterfactual without any incentives for WSME lending.

We are not hypothesizing which intervention will be more effective relative to the other, as the past literature and other evidence provides mixed guidance. Ultimately, the key competing factors will be how much benefit comes from the greater zero-sum competition in the contest approach.

- **Hypothesis 2a:** The multi-category contest intervention will cause an increase in aggregate WSME lending volumes and associated bank revenues, but a decrease in the average size of WSME loans.
Hypothesis 2b: The piece-rate intervention will cause an increase in aggregate WSME lending volumes and associated bank revenues, but a decrease in the average size of WSME loans.

Reasoning: We expect the overall effect on aggregate WSME lending volumes to be positive as an extension of the increased number of WSME loans. However, average WSME loan sizes are likely to decrease because the incentives are based on number of new WSME clients, rather than volumes. Nevertheless, given that other lending agent incentives are still in place to encourage lending size, this effect should be relatively muted.

- **Hypothesis 3a:** The multi-category contest intervention will cause an increase in the overall number of new SME borrowers, at both the branch and lending agent levels—but also a minor reduction in business in non-incentivized product lines.
- **Hypothesis 3b:** The piece-rate intervention will cause an increase in the overall number of new SME borrowers, at both the branch and lending agent levels—but also a minor reduction in business in non-incentivized product lines.

Reasoning: if Hypothesis 1 holds then lending agents should be allocating more attention to WSME lending, which may decrease sales in other non-WSME product lines. However, if WSMEs are provided with an inefficiently low amount of financing in the counterfactual, then the incentive program should lead to an improvement in overall lending performance.

- **Hypothesis 4a:** The multi-category contest intervention will cause an increase in time spent and focus on WSME lending on the part of lending agents.
- **Hypothesis 4b:** The piece-rate intervention will cause an increase in time spent and focus on WSME lending on the part of lending agents.

Reasoning: these behaviors, measured primarily in survey data, are the implicit “first stage” in the study. If the other hypotheses H1-3 hold, then they should be supported by changed inputs, e.g., time spent and lending strategies.

The main outcome of the study is the monthly number of new WSME borrowing clients, on secured, unsecured, and overdraft loans, as this is the outcome upon which the incentive design is based. This outcome will be measured using administrative data on loan issuance, at branch level, and disaggregated at lending agent level. Testing the effect of the treatments on this outcome will be our main test of Hypotheses 1a and 1b. As part of our secondary analysis, we will study variation in the distribution of lending (e.g., lending by week) and how it may be impacted by the treatments.

We will have multiple components to our secondary analysis.

First, we will study how the interventions affect the composition of the lending portfolio for WSME clients. In particular, we will study how the total volume and average size of WSME loans is impacted by the intervention (H2a and H2b), as well as the impact on a number of other characteristics of new WSMEs, including sector, geographic location, size of business, age of business, and nature of the loan application (e.g., loan length, interest rate, intended purpose, etc).

Second, we will study how the interventions affect the sales portfolio more broadly. We will test the impact on overall SME lending and whether they cause a reduction in activity elsewhere in the portfolio (H3a and H3b). We will also carry out back-of-envelope calculations on how this is likely to impact overall profitability. We will study which types of clients are lost or gained as a result of the interventions (in terms of characteristics such as product, size, gender, geography, sector).

Third, we will estimate the implicit “first stage” through our survey-based measures of lending agent behavior, in terms of changes in lending strategies (if any) and time spent on WSME lending or other activities (H4a and H4b). This will provide insight on how the incentives impact lending agent behavior, if at all, and if so, how.

Basic methodological framework / identification strategy

This study is a randomized controlled trial with randomization occurring at the bank branch level. This design is suitable because it allows the impact of the interventions on lending outcomes to be compared to a counterfactual.

Intervention

Intervention design

The bank and has worked with the research team to design two interventions for testing with lending agents, one based on a contest design, one based on piece rate incentives, while also maintaining a control group:

1. An inclusive lending contest, with awards for
 - a. Top lenders to WSMEs overall (largest number of prizes);
 - b. Most improved WSME lenders: lending staff with only 0, 1, or 2 WSME loans in the past 12 months;
 - c. Best new WSME lender: only open to staff who have joined the bank in the past 12 months and passed probation.
2. Piece rate incentive (fixed amount per loan issued).

The award amounts and piece rate incentive have been calibrated so each treatment arm should have approximately the same budget. This was done by observing data on WSME lending volumes from April, 2022, to March, 2023, and estimating a 25% increase in lending under our interventions.

Branches' management teams will also face the same contest-based incentives in both treatment arms, with awards provided on a quarterly basis.

The intervention design is outlined in the following sub-sections, with the bank's internal policy documents provides as an attachment, in English and Vietnamese.

Qualifying credit products

A qualifying credit product application must be:

- First credit product with VP Bank:
 - Collateralized loan
 - Uncollateralized loan
 - Overdraft
- Within the WSME category;⁷ and

Timing

⁷ WOS1: company that has at least 51% of contributed capital/equity associated with women; WOS2: company has at least 20% up to less than 51% of contributed capital/equity associated with women and has at least one woman as Director/CEO and women accounting for at least 30% of members of the Board of Directors.

For purposes of consideration in the competition, loan applications will first be assigned to the month in which they are submitted. Loan approval may occur in the following month, and loan disbursement may occur much later.

To contribute to the final count for that month, or quarter, loan approval must come by the 14th day of the next month after original sourcing of the loan. If approved on the 15th or later, eligibility can be added to the count for the subsequent month, or quarter.⁸ Awards will be determined by the end of the subsequent month (month after focal month for monthly awards, month after end of quarter for quarterly awards). For example, monthly program outcomes for February will need to be determined by the end of March.

Scoring Rules for Treatment 1 (Contest)

Rules will vary slightly between the two branch Groups based on the assumption that lending opportunities are relatively more balanced across branches within Branch Group 1 than they are in Branch Group 2. As a result, while contest rules for branch Group 1 will be based simply on numbers of successful WSME loan applications, we will adjust these numbers in Branch Group 2 based on a provincial WE supply index (which itself will be based on WSME enterprise numbers from Vietnam's GSO Enterprise Survey).

Specifically, this will mean the following:

Branch Group 1 (13 urban branches)

- monthly individual prizes will be based off of:
agent's number of successful WE loan applications in the month
- quarterly manager prizes will be based off of:
branch's number of successful WE loan applications in the quarter

Branch Group 2 (37 provincial branches)

- monthly individual prizes will be based off of:
$$\frac{\textit{agent's number of successful WE loan applications in the month}}{\textit{provincial WE supply index}}$$
- quarterly manager prizes will be based off of:
$$\frac{\textit{branch's number of successful WE loan applications in the quarter}}{\textit{provincial WE supply index}}$$

The provincial WE supply index is based on the ratio of the province's proportion of women's owned enterprises, to the province with the maximum proportion of women's owned enterprises. For example,

⁸ On average, the loan approval takes 2-3 days for unsecured, cash flow-based loans and 2 weeks for secured, collateralized loans, so the vast majority of loans should be awarded for the month the loan application was submitted in.

suppose the maximum province has a proportion of 40% women-owned enterprises. Suppose a particular province A has a ratio of 30%. Then province A's provincial WE supply index is 0.75.

Treatment 1: Multi-category Contest Award Rules

Lending Agent Monthly⁹

The contest will be between lending agents in all branches in each Group (so 1/3 of ~345 officers in 4/12 branches in Branch Group 1 and 1/3 of ~164 officers in 12/37 branches in Branch Group 2). This “pooled contest” approach has the advantages that:

1. It makes all the contest categories feasible – for example, many individual provincial branches won't have any new lending agents and so the “Best New WSME Lender” category would not have any meaning if it were restricted to just the branch level.
2. It reduces social tensions within the branches as we don't have explicit within-branch contests (though branch staff still compete with each other because they are all part of the same Group).

Multi-category contest

- Top winners:
 - Top WSME lenders with at least 1 WSME loan.
- Most improved WE lender
 - Top WSME lenders with at least 1 WSME loan, with at least 366 days of continuous tenure at VP Bank, as of the 1st day of the month, and a low amount of WSME lending in the last 12 months (0, 1 or 2 WSME loans in the past 12 months).
- Best new WE lender
 - Top WSME lenders with at least 1 WSME loan, with 365 days or less of continuous tenure at VP Bank, as of the 1st day of the month, and having passed probation.

Candidates would be eligible for all prizes in the categories they are eligible for. So, for example, a high-performing lending agent with less than 365 days of tenure could win a prize both in the ‘Top winners’ category and in the ‘Best new WE lender’ category.

The incentives were modified between the two phases. In Phase 1, the distribution of prizes was as follows, in Vietnam Dong (1 USD = ~24,000 VND)

Monthly individual prize value for each contest category	Top winners	Most improved lenders	Best new WE lenders
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⁹ Under the previous contest design, each lending agent received 500,000 VND per loan (and 300,000 VND or 500,000 VND for other products like accounts and credit cards). There was a fixed amount of reward money available in each month, and the funds typically ran out before the end of the month.

Group 1 (4 branches)	1st prize	3,500,000	2,500,000	2,500,000
	2nd prize	3,000,000	2,000,000	2,000,000
	3rd prize	2,500,000	1,500,000	1,500,000
	4th prize	2,000,000	1,500,000	1,500,000
	5th prize	2,000,000	1,500,000	1,500,000
	6th prize	1,500,000		
	7th prize	1,500,000		
	8th prize	1,500,000		
	9th prize	1,500,000		
	10th prize	1,500,000		
Group 2 (12 branches)	1st prize	3,500,000	2,500,000	2,500,000
	2nd prize	3,000,000	2,000,000	2,000,000
	3rd prize	2,500,000	1,500,000	1,500,000
	4th prize	2,000,000		
	5th prize	2,000,000		

In Phase 2, the distribution of prizes was as follows. In general, there was a sense that the prize award schedule should be “steeper.”

	Monthly individual prize value for each contest category	Top winners	Most improved lenders	Best new WE lenders
Group 1 (4 branches)	1st prize	4,500,000	2,500,000	2,500,000
	2nd prize	3,500,000	2,000,000	2,000,000

	3rd prize	3,000,000	1,500,000	1,500,000
	4th prize	2,500,000	1,500,000	1,500,000
	5th prize	2,000,000	1,500,000	1,500,000
	6th prize	1,500,000		
	7th prize	1,500,000		
	8th prize	1,500,000		
	9th prize	1,500,000		
	10th prize	1,500,000		
Group 2 (12 branches)	1st prize	4,500,000	2,500,000	2,500,000
	2nd prize	3,500,000	2,000,000	2,000,000
	3rd prize	2,500,000	1,500,000	1,500,000
	4th prize	2,000,000		
	5th prize	1,500,000		
	6th prize	1,500,000		
	7th prize	1,500,000		

In Phase 2 we also introduced a random draw incentive, where in each of the four (treatment x group) combinations, there is a end-of-Phase lottery to draw an iPhone. The odds of each lending agent is directly proportional to the number of WSME loans they issued in the quarter, i.e., calculated as the proportion of WSME loans they issued in their (treatment x group) cohort. For example, if Group 1 / Treatment 1 has 150 new micro-WE loans in Phase 2, and agent A sells 1 loan, (s)he has 1/150 odds for the iPhone. Agent B with 6 loans has 6/150 odds.

There are also incentives for branch managers in both Phases, which are described as follows:

	Quarterly manager prize value for each treatment	Treatment 1	Treatment 2
Group 1 (4 branches)	First prize	15,000,000	15,000,000
	Second prize	10,000,000	10,000,000

	Third prize	5,000,000	5,000,000
Group 2 (13 branches)	First prize	8,000,000	8,000,000
	Second prize	6,000,000	6,000,000
	Third prize	5,000,000	5,000,000
	Fourth prize	4,000,000	4,000,000
	Fifth prize	3,000,000	3,000,000
	Sixth prize	2,500,000	2,500,000
	Seventh prize	2,000,000	2,000,000

In Phase 2, we also added prize incentives for section heads in branches with section heads.

	Quarterly manager prize value for each treatment	Treatment 1	Treatment 2
Group 1 (4 branches)	First prize	5,000,000	5,000,000
Group 2 (13 branches)	First prize	5,000,000	5,000,000

Treatment 2: Piece Rate Rules

Lending agents will receive a fixed piece rate of 2 million Vietnam Dong (85 USD) for each WE credit product they issue, in both Phases.

Communication

Communication about the contest will be designed as equal as possible across the two treatment arms. The bank provides information in advance of each Phase, then every 2 weeks the bank provided email updates to all staff (lending agents and managers) on the progress of WSME lending performance at branch-level, a “leader board” for the top performers at lending agent level, for branches within the contest treatment arms (4 in Group 1, 12 in Group 2). Group 1 branches and staff will only see results from Group 1, and Group 2 staff will only see results from Group 2.

Random assignment

The sample has 50 bank branches, which will be randomly assigned into two treatment arms and one control group (16-16-18). The branches will be divided into two groups, with randomization stratified in each

group: 13 branches in urban regions (Hanoi and Ho Chi Minh City) and other regions with high lending performance (“Group 1”), and 37 branches in provincial regions (“Group 2”).

In Group 1, the 13 branches are randomized into the treatment arms 4-4-5. The branches are sorted in order based on administrative data on our main outcome variable (number of new WSME loans) over the 12-month period April, 2022 to March, 2023. The median branch is assigned to the control. The other branches are randomly assigned to guarantee that one of the branches ranked 1-3 is in each of the three arms (2 treatment arms and control), one of the branches ranked 4-6 is in each of the three arms, one of the branches ranked 8-10 is in each of the arms, and one of the branches ranked 11-13 is in each of the arms.

In Group 2, the 37 branches are randomized into the treatment arms 12-12-13. The branches are sorted in order based on administrative data on our main outcome variable (number of new WSME loans) over the 12-month period April, 2022 to March, 2023. The median branch is assigned to the control. The other branches are randomly assigned to guarantee that three of the branches ranked 1-9 is in each of the three arms (2 treatment arms and control), three of the branches ranked 10-18 is in each of the three arms, three of the branches ranked 20-28 is in each of the arms, and three of the branches ranked 29-37 is in each of the arms.

The code for the randomization is attached to our submission. This includes the code for Phase 2 randomization.

Sample and statistical power

Sample

There are two units of analysis: branches and lending agents, and prospective WSME clients. We include *all* eligible branches and attempt to include all eligible staff (subject to survey consent) in the baseline sample. Hence power calculations do not impact our sample size, as that has already been maximized within our context, however power calculations can still provide guidance on what effects we might be able to detect.

Approximately 450 lending agents are divided across the 50 branches. The urban branches tend to have much larger staff allocations, with 20-40 lending agents, while provincial branches are typically much smaller. There are approximately 75 managers divided across the branches. With only a couple exceptions, the provincial branches only have a single branch manager, while the urban branches tend to have a layer of team managers below the branch manager. This sample maximizes the eligible population – i.e., we have included all of the bank’s branches involved in SME lending, and within those branches, all staff involved in lending the (W)SME products we focus on.

Power calculations

We conduct power calculations by simulation. First, we use prior data from the partner bank to calculate the mean, standard deviation, and autocorrelation, of our two main outcome variables, at branch and lending-agent level:

1. Monthly number loans to WSMEs;
2. Monthly volume of loans to WSMEs.

These statistics are calculated in the following table, for the time period July-December, 2022.

Outcome	Monthly number of loans		Monthly volume of loans (VND)	
	Branch	Lending agent	Branch	Lending agent
Mean	20.5702	0.7739327	20605528288	775261899
Standard deviation	23.59071	2.182482	30070826111	4062072278

We use these statistics to simulate 1,000 synthetic datasets, over 1 pre-treatment month and 6 treatment months, for different effect sizes. Our comparisons are of treatment to control, so we simulate the data for one treatment group (16 branches) and one control group (18 branches). Lending agents are assigned to branches by stratifying the 4 urban treatment branches, 5 urban control branches with larger numbers of agents, and the 12 provincial treatment branches, and 13 provincial control branches with lower numbers of agents.

We then run our two-way fixed effects analysis on these simulated datasets (see equations (1) and (2) below, absent other controls, with standard errors clustered at branch level), to determine the minimum effect size at which we have power of 0.8 (minimum detectable effect = MDE), with conventional tests with $\alpha = 0.05$. We run the analysis both on a pooled treatment effect parameter as in equations (1) and (2), and specifications in which we stratify by month. This leads to the following results:

Pooled treatment effect

Outcome	Monthly number of loans		Monthly volume of loans (VND)	
	Branch	Lending agent	Branch	Lending agent
MDE (% change)	51%	25%	50%	25%
MDE (fraction of sd)	0.44	0.09	0.34	0.05

Stratified treatment effect

Outcome	Monthly number of loans		Monthly volume of loans (VND)	
	Branch	Lending agent	Branch	Lending agent
MDE (% change)	60%	31%	56%	30%
MDE (fraction of sd)	0.53	0.11	0.38	0.06

3. Data

Data collection and processing

There are three main data sources on lending agents and their managers: survey, online and administrative data. This data collection aims to cover the universe of lending agents and their managers involved in WSME lending at the bank. Staffing lists have been provided by the bank.

First, the research team will collect survey data from lending agents and their managers at baseline (June, 2023),¹⁰ midline (December, 2023) and endline (August, 2024). All relevant staff who have passed the mandatory 2-month probation period will be surveyed. Because of attrition and ongoing hiring of new lending agents and managers, the research team will conduct a “rolling baseline” that will be ongoing from July, 2023 to June, 2024. Existing staff, and new staff who pass probation before November, 2023, will be

¹⁰ 454 lending agents and 73 managers were interviewed in the baseline survey in June, 2023.

included in the midline survey, while existing staff, and new staff who pass probation before June, 2024, will be included in the endline survey. These surveys will be collected by video and phone interview, using an approach designed to maximize privacy of respondents while maintaining control over interview quality. The baseline survey instruments (lending agents and managers) are attached to this proposal.

Second, the interviews will be complemented by three online data collection modules: (1) an implicit association test (IAT), and (2) a small survey experiment, in which agents are presented with four hypothetical loan applications in which the gender of the applicant is varied, and asked to assess them, and (3) risk and time preference questions. These modules were launched in October, 2023, and primary collected in November and December, 2023, and as part of the rolling baseline.

Third, the research team will receive administrative data from the partner bank on an intermittent basis during the study period, at endline, and for one-year post-intervention (i.e., through September, 2025). The administrative data will involved data on lending outcomes (number, amount, loan terms, loan characteristics, loan performance) linked with data on lending agents and branches.

In addition the research team will survey a random sample of 200 new VP Bank WSME clients who joined VP Bank during the study period, to understand their characteristics, business performance, use of finance, and perceptions of the interventions, by video interview. These interviews will be conducted after September, 2024 (exact timing TBD).

Variations from the intended sample size

We expect minor attrition issues, as lending agents may refuse to participate in the survey,¹¹ and there may be a small amount of staff turnover during the survey period. New staff hiring will be picked up by the rolling baseline survey.

As the interventions are assigned at bank branch level and administered by the bank, concerns about treatment non-compliance are negligible. We view individual lending agents' willingness to respond to the intervention as a secondary outcome, rather than a sign of attrition.

Balance checks

We report on balance checks based on administrative data on past lending that were shared by the partner bank prior to the study launch. We conduct balance checks at both branch-level (the level of treatment) and lending agent level. Specifically, we have branch-level data on WSME lending over the period April, 2022, to March, 2023. We also have branch-level and lending agent-level data over the period 2019-2022. None of these datasets are balanced panels because there is attrition and new hiring at the lending agent level, and some branches have newly launched or merged over time. Since the upload of the original PAP, we received additional variables (mostly disaggregated data; e.g., distinguishing secured and unsecured loans), and a short time period extension.

The equation for branch-level balance checks is as follows:

$$Y_b = \beta_1 D_{treatment1_b} + \beta_2 D_{treatment2_b} + \beta_3 D_{group2_b} + \varepsilon_b,$$

¹¹ In practice the baseline survey resulted in about 20 less interviews than intended based on staff lists, through a combination of staff having departed the bank as of the time of the survey, or refusals.

(1)

where Y_b is the outcome variable, $Dtreatment1_b$ and $treatment2_b$ are the treatment dummies (the Control group is the omitted dummy), $Dgroup2_b$ is a dummy for being in group 2 and ε_b is the error term, which is clustered at branch level.

The equation for lending agent level balance checks is as follows:

$$Y_{i,b} = \beta_1 Dtreatment1_{i,b} + \beta_2 Dtreatment2_{i,b} + \beta_3 Dgroup2_{i,b} + \varepsilon_{i,b}, \quad (2)$$

where $Y_{i,b}$ is the outcome variable, $Dtreatment1_{i,b}$ and $Dtreatment2_{i,b}$ are the treatment dummies, $Dgroup2_{i,b}$ is a dummy for being in group 2, $\varepsilon_{i,b}$ is the error term. Errors are clustered at the branch level.

The balance checks are reported in Appendix A, with the Phase 1 branch-level results in Table A.1 and the Phase 1 lending-agent level results in Table A.2, and the Phase 2 branch-level results in Table A.3 and the Phase 2 lending-agent level results in Table A.4.

We see that many tests are insignificant at the 10% level or higher. However it is notable that a handful of key variables are significant at branch-level, which we will control for as a robustness check in our treatment effect analysis:

- Phase 1 (branch-level):
 - Monthly average number of new secured micro-loans. Treatment 1 vs Treatment 2 difference significant at 4.5%.
 - Monthly average number of new secured micro-loans to women owned SMEs. Treatment 1 vs Treatment 2 difference significant at 3%.
 - Monthly average number of new secured micro-loans to male owned SMEs. Treatment 1 vs Treatment 2 difference significant at 6.3%.
 - Number of rookies (as of June 2023). Treatment 1 vs Treatment 2 difference significant at 7.1%.
- Phase 2 (branch-level):
 - Number of branch managers (as of June 2023). Treatment 1 vs Treatment 2 difference significant at 10%.
 - Number of rookies (as of June 2023), Treatment 2 vs Control difference significant at 3.2%. Treatment 1 vs Treatment 2 difference significant at 2.4%.

Pilot data

A previous intervention in the partner bank provides guidance on effect size estimates, feasibility, proof of concept, and inspiration for the intervention we aim to test.

In 2021 and 2022, our partner bank partnered with the Vietnam branch of an international NGO to conduct a program to increase lending to WSMEs. The program was limited to 10 of our 50 branches (the 10 urban branches that focus exclusively on micro SME lending; 5 in Hanoi and 5 in Ho Chi Minh City). The program ran between Oct 2021 – Dec 2021 (phase one), and from Mar 2022 – Oct 2022 (phase two). The program had some similar characteristics as our intervention:

1. Lending agents could receive piece rate incentives in the amount of 500,000 VND (about 20 USD), for WSME products; about $\frac{1}{4}$ the value of our proposed piece rate. The program counted the three

WSME lending products we consider (secured and unsecured loans, overdrafts) but also credit cards and accounts. There was a fixed monthly budget for the piece rates, which could run out during the month (and often did, sometimes halfway through the month). We expand on this program in a number of ways, including:

- a. Expanding from 10 to 50 branches;
 - b. Running the program in 2 consecutive 6-month phases;
 - c. Testing two different interventions – piece rates and a contest;
 - d. In the piece rate design, quadrupling the amount to 2 million VND, but also limiting the number of eligible products, and further by ensuring that there is no monthly cap on the piece rate award pool (reducing potential uncertainty over whether the pool might run out in a given month);
 - e. Adding the contest intervention.
2. The program also included branch-level incentives in each phase – 8 prizes, with values decreasing from the first to eight-placed branch. These prizes were publicly announced and in many cases the branch managers shared the prizes with all branch members. In the updated intervention we have included branch-level prizes, which are focused exclusively on managers, and will not be publicly announced.

To inform our intervention design and prospective effect sizes, we conducted an analysis of the preceding program using synthetic control methods, leveraging 5 years of lending data at the branch- and lending-agent level from our partner bank. We focused on central outcomes such as the number of clients, and number of new loans (WSME and SME). Our treatment group was the 10 treatment branches (and the staff in those branches) and our control was the other branches conducting micro SME lending. The results can be seen in the following two figures, Figure 1 and Figure 2.

Treated and Counterfactual Averages

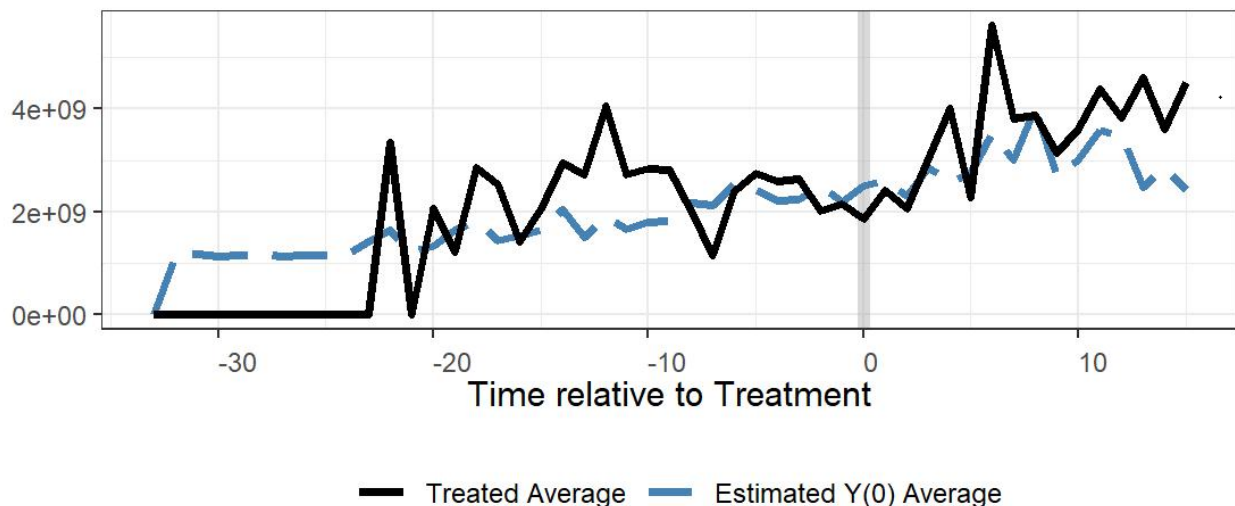


Figure 1. Phase 1 impact on volume of lending to WSMEs (2021)

Treated and Counterfactual Averages

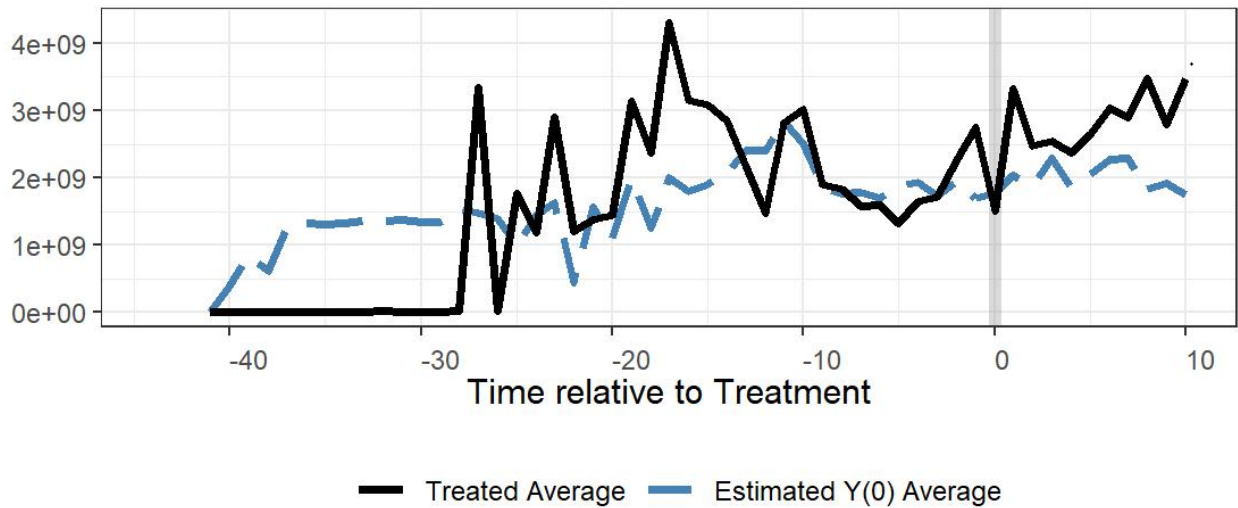


Figure 2. Phase 2 impact on volume of lending to WSMEs (2022)

Treated and Counterfactual Averages

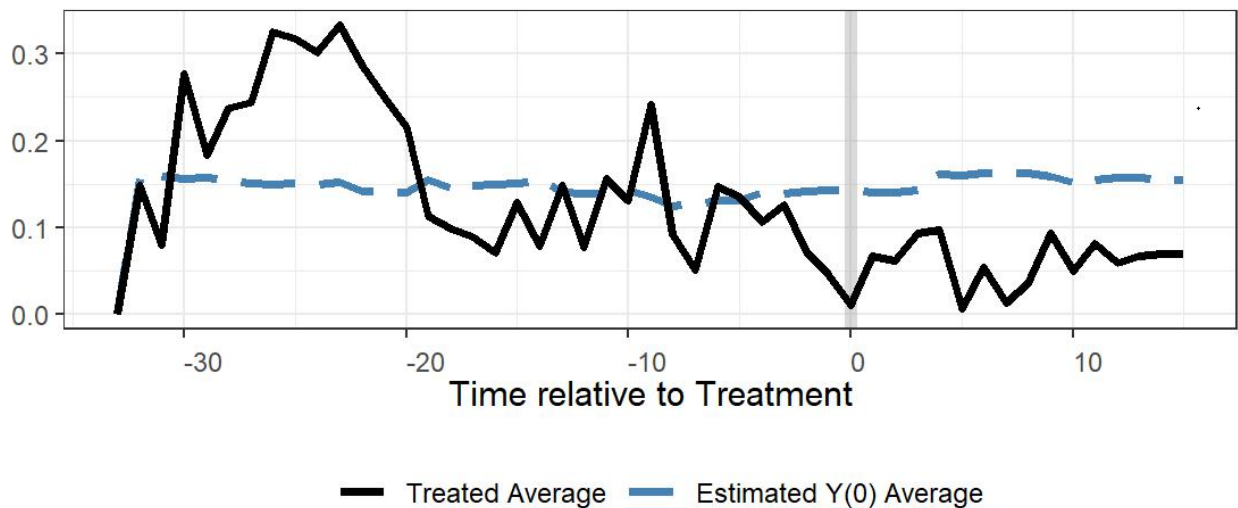


Figure 3. Phase 1 impact on number of loans to WSMEs (2021)

Treated and Counterfactual Averages

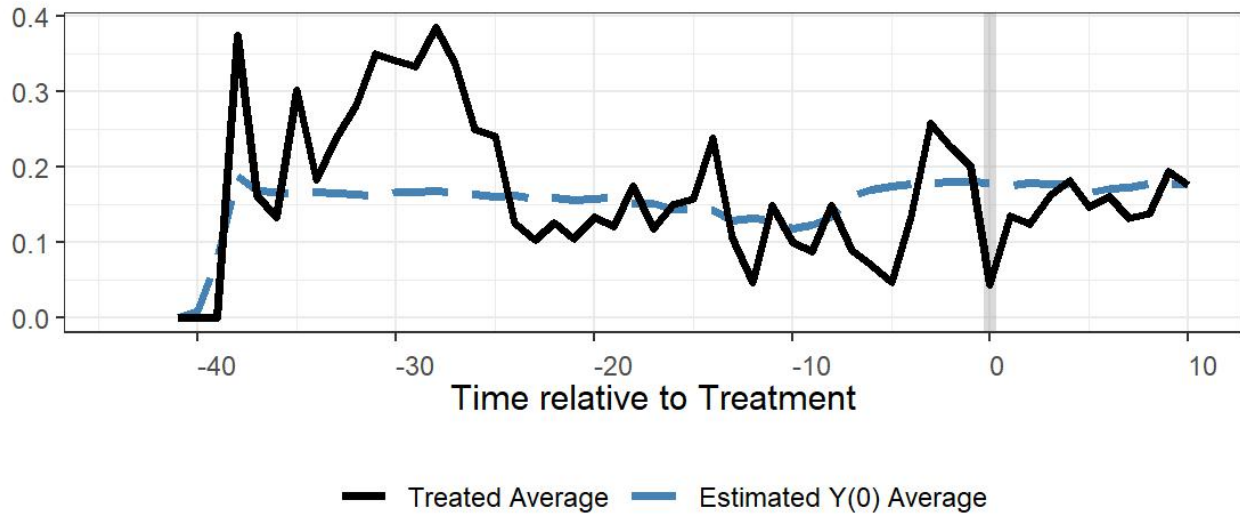


Figure 4. Phase 2 impact on volume of lending to WSMEs (2022)

The results are suggestive of quite mixed impacts of the earlier program. There are also concerning anomalies in the pre-trend data. There is some evidence that WSME loan volumes increase, while the number of loans decreased (suggesting the program encouraged fewer loans in larger amounts). Hence we are cautious about reading too much into these results. In light of the significantly larger incentives in our program, and rebalancing incentives to focus on number of loans rather than volume, we have based the intervention design on the assumption that our interventions would cause a 25% increase in WSME lending in our target lending products.

The previous intervention also provides some institutional experience and acceptance of this type of intervention as a proof of concept and evidence of feasibility, which has provided a basis to design and expand the scope of the interventions and test them more rigorously.

4. Analysis

Statistical methods

We will apply standard linear panel treatment effects models to the analysis of our study data. We do not expect any significant missing in our main outcome variables that are derived from administrative data (e.g., loan issuance, loan volumes, lending agent and branch performance) because those must be carefully validated by the bank partner. There may, however, be missing values in our survey data. We will typically run regressions without accounting for missing data, though if there is an anomalous amount of missing data in a certain variable (e.g., more than 10%), we may interpolate outcomes. To account for outliers, as a robustness check we will run the results on survey variables windsorizing a 2-98%.

Statistical model

The branch-level treatment effects estimation will be from the following equation:

$$Y_{b,t} = \beta_1 Dtreatment1_{b,t} + \beta_2 Dtreatment2_{b,t} + FE_t + FE_b + \gamma X_{b,t} + \varepsilon_{b,t},$$

where b represents a branch and t represents a time period, $Y_{b,t}$ is an outcome, $Dtreatment1_{b,t}$ is the dummy for treatment group 1, $Dtreatment2_{b,t}$ is the dummy for treatment group 2, FE_t and FE_b are time period and branch fixed effects, γ is a vector of coefficients on control variables $X_{b,t}$ and $\varepsilon_{b,t}$ is a robust error term clustered at branch level.

The lending agent-level treatment effects estimation will be from the following equation:

$$Y_{i,b,t} = \beta_1 Dtreatment1_{b,t} + \beta_2 Dtreatment2_{b,t} + FE_t + FE_b + \gamma X_{i,b,t} + \varepsilon_{i,b,t},$$

where b represents a branch and t represents a time period, $Y_{i,b,t}$ is an outcome, $Dtreatment1_{b,t}$ is the dummy for treatment group 1, $Dtreatment2_{b,t}$ is the dummy for treatment group 2, FE_t and FE_b are time period and branch fixed effects, γ is a vector of coefficients on control variables $X_{i,b,t}$, and $\varepsilon_{i,b,t}$ is a robust error term clustered at branch level.

The analysis will have two sources of temporal variation:

1. Administrative data. Our main results will aggregate outcomes (e.g., number of WSME loans, volume of new WSME lending) to the month. The first phase of the intervention will then have 6 1-month periods, plus a 1-month baseline period prior to the intervention.
2. Survey data. We will have pre-intervention baseline data, a midline survey, and an endline survey. The midline survey will serve as a pseudo endline for the first phase of the intervention (first 6 months).

We will also be able to stratify the results based on administrative data by month, i.e., estimate monthly treatment effect parameters, $\beta_{1,t}$ and $\beta_{2,t}$.

Multiple outcome and multiple hypothesis testing

We have a small number of primary outcomes focused on number and volume of loans, and hence will not address multiple hypothesis testing for these outcomes.

However, for some secondary outcomes and heterogeneity analysis we have a larger set of outcomes, and hence will create indexes for multiple variables, particularly on measures of social networks and entrepreneurial connections, and our measures capturing attitudes toward gender and women entrepreneurs. In particular

- We will construct multiple **indices of personal connections to business and entrepreneurship**:
 - Dummy for whether mother was a business owner;
 - Dummy for whether mother was a business owner or manager;
 - Dummy for whether there is/was a female entrepreneur in their close circle – mother, other relative, or friend;
 - Dummy for any entrepreneur in close social circles – male or female;
 - Index for proportion of 5 closest friends who own a business;
 - Dummy for whether they are part of an entrepreneurship-related club or organization.
- **Index of gender bias**; uniform index with the following components, where values in the numerator take a value 1 if the respondent agrees or strongly agrees, and the value of the denominator is 6:

- Women don't have time for business networking.
- Women entrepreneurs are more risk averse than male entrepreneurs in seeking finance.
- Owning and managing a business and managing family responsibilities are compatible for female entrepreneurs [recode based on disagree or strongly disagree]
- Women only focus on entrepreneurship "on the side."
- Women are not as effective at business leadership as men.
- A female entrepreneur is less likely to repay a bank loan than a male entrepreneur.
- **Index of competitiveness**; uniform index with the following components, where values in the numerator take a value 1 if the respondent agrees or strongly agrees, and the value of the denominator is 3:
 - I generally perform better when I face competitive pressures, such as when I earn more only if I am one of the top performers.
 - Competition brings out the best in me.
 - I find competition stressful and demotivating. [recode based on disagree or strongly disagree]

Heterogeneous Effects

We will run heterogeneous effects on the following baseline variables:

1. **Past lending to WSMEs**: number of WSME loans on the 12 months preceding the intervention. The rationale is that lending agents and branches that have had more recent success in WSME lending may show even greater performance in response to incentives. On the other hand, they may already be closer to their performance frontier, and incentives may serve more to encourage others to "catch up." We will calculate the interaction variable in levels and normalized (i.e., in terms of standard deviations from the mean in their branch or group).
2. **Exposure to WSME lending**: dummy for whether the lending agent has/had a women entrepreneur in their close social circle (mother, family member, or friend; if average of dummy is close to 1, then we may construct a dummy with a higher threshold). The rationale is that past exposure to women's entrepreneurship may make the lending agent much more open and suited to lending to WSMEs, especially in response to the incentive intervention. Hence we would hypothesize a positive interaction between past exposure to WSME lending and treatment. However, it is possible that those with past exposure are already lending more intensively to WSMEs, and the intervention helps overcome the lack of past exposure for other lending agents.
3. **Attitudes toward women entrepreneurs**. We will construct indices of attitudes toward women entrepreneurs based on:
 - a. The implicit association test, which is adapted slightly from Harvard Implicit Project's gender-career IAT to emphasize the specific career of entrepreneurship. Greater gender bias is attributed when respondents are quicker to associate women with words connected to domestic life and men to entrepreneurial words.
 - b. Based on an index constructed from a series of questions in the survey about respondents' attitudes toward women entrepreneurs (see index of gender bias, above).
 - c. Based on the hypothetical loan applications. Each respondent faces four hypothetical loan applications, two riskier cases and two less-risky cases. Male-gendered and female-gendered names are randomly assigned to each of the risky and less-risky loan

applications. We will construct an index of bias based on each dimension of the loan application questions individually,¹² and then create a uniform index based on aggregating bias along each dimension.

The rationale is that discriminatory attitudes toward women entrepreneurs are present, we would expect them to have a negative effect on agents' lending to WSMEs.

4. **Lending agent gender.** Dummy variable for whether the lending agent is female.

5. Interpreting Results

Testing the effects of both treatments against the control on lending to new WSME clients will speak to the role of monetary incentives in motivating increased lending to WSMEs, per Hypothesis 1. While a positive effect from one or both treatments would not be surprising, the magnitude of the effect would be relevant from a policy design perspective, particularly in terms of whether the positive effect on bank profits outweighs the cost of the incentives. If it does, then it would suggest that there are profit-making opportunities that can be enabled for financial institutions by focusing more on WSME clients, which would imply that other financial institutions in emerging markets should consider well-designed incentives to better access WSME lending. A null result, particularly with economically-small magnitudes, would jointly draw into question our incentive designs and the willingness of agents to respond to financial incentives to increase WSME lending. Secondary analysis would allow us to tease out possible explanations for a null result – e.g., whether it is a lack of “first stage” impact on lending agent behavior.

The question of which intervention is more impactful speaks to the broader literature on optimal incentive design in organizations. While some literature suggests that piece rates would be more effective for simple tasks with easily-measured outcomes, and a contest could be more impactful for more complex tasks that might arguably include loan issuance, there are key mitigating factors such as cultural responses to competition. A finding in either direction – in favor of piece rates, or in favor of the contest – would provide important, real-stakes evidence on this question. A finding in favor of piece rates might provide some push back on the contention that piece rates are best for simple tasks. While a finding in favor of the contest would suggest that competitive incentives can work to spur greater performance, at least in an environment where agents already feel a degree of pressure to compete. There are a range of private-sector and public-sector contexts where improved incentive design could help spur improved economic development outcomes.

¹² a) difference in likelihood of approving loan for otherwise similar male and female applicants; b) difference in loan amount willing to approve for otherwise similar male and female applicants; c) whether otherwise similar male and female applicants qualify for interest rate reduction; and d) whether otherwise similar male and female applicants require guarantor.

6. Appendices

Appendix A: Balance checks

Table A.1. Balance checks at branch level for Phase 1 of Study 2 (SME Lending Contest)

	Relative to Control Coefficient	p-value	Relative to Treatment 1 Coefficient	p-value
Monthly average number of new micro-loans				
Treatment 1: contest	1.16	0.494		
Treatment 2: piece-rate	-1.09	0.552	-2.25	0.179
Monthly average number of new unsecured micro-loans				
Treatment 1: contest	0.36	0.647		
Treatment 2: piece-rate	0.16	0.782	-0.20	0.810
Monthly average number of new secured micro-loans				
Treatment 1: contest	0.80	0.498		
Treatment 2: piece-rate	-1.25	0.346	-2.05	0.045
Monthly average number of new micro-loans to women owed SMEs				
Treatment 1: contest	0.30	0.455		
Treatment 2: piece-rate	-0.22	0.583	-0.52	0.207
Monthly average number of new unsecured micro-loans to women owned SMEs				
Treatment 1: contest	0.03	0.859		
Treatment 2: piece-rate	0.04	0.779	0.01	0.959
Monthly average number of new secured micro-loans to women owned SMEs				
Treatment 1: contest	0.27	0.311		
Treatment 2: piece-rate	-0.26	0.366	-0.53	0.030
Monthly average number of new micro-loans to male owned SMEs				
Treatment 1: contest	0.59	0.615		
Treatment 2: piece-rate	-0.82	0.531	-1.41	0.219
Monthly average number of new unsecured micro-loans to male owned SMEs				
Treatment 1: contest	0.08	0.868		
Treatment 2: piece-rate	0.10	0.806	0.03	0.958
Monthly average number of new secured micro-loans to male owned SMEs				

Treatment 1: contest	0.52	0.570		
Treatment 2: piece-rate	-0.92	0.375	-1.44	0.063
Number of staff (as of June 2023)				
Treatment 1: contest	1.11	0.559		
Treatment 2: piece-rate	-1.01	0.631	-2.12	0.320
Number of sales agents (as of June 2023)				
Treatment 1: contest	0.75	0.676		
Treatment 2: piece-rate	-1.12	0.555	-1.88	0.348
Number of branch managers (as of June 2023)				
Treatment 1: contest	0.36	0.066		
Treatment 2: piece-rate	0.11	0.623	-0.25	0.205
Number of rookies (as of June 2023)				
Treatment 1: contest	-0.12	0.912		
Treatment 2: piece-rate	-1.94	0.039	-1.81	0.071
Number of most improved sales agents (as of June 2023)				
Treatment 1: contest	0.25	0.827		
Treatment 2: piece-rate	0.62	0.630	0.38	0.790

Columns 1 and 2 show the coefficient estimates and associated p-values for t-tests comparing each Treatment arm to the Control. Columns 3 and 4 show the coefficient estimates and associated p-values from a t-test comparing Treatment 2 to Treatment 1.

The error terms are clustered by branch.

Table A.2. Balance checks at lending agent level for Phase 1 of Study 2 (SME Lending Contest)

	Relative to Control		Relative to Treatment 1	
	Coefficient	p-value	Coefficient	p-value
Monthly average number of new micro-loans				
Treatment 1: contest	0.06	0.569		
Treatment 2: piece-rate	-0.04	0.772	-0.10	0.362
Monthly average number of new unsecured micro-loans				
Treatment 1: contest	0.01	0.887		
Treatment 2: piece-rate	0.01	0.834	0.00	0.948
Monthly average number of new secured micro-loans				
Treatment 1: contest	0.05	0.534		
Treatment 2: piece-rate	-0.05	0.629	-0.11	0.180
Monthly average number of new micro-loans to women owed SMEs				
Treatment 1: contest	0.01	0.771		
Treatment 2: piece-rate	0.01	0.737	0.00	0.930
Monthly average number of new unsecured micro-loans to women owned SMEs				
Treatment 1: contest	-0.01	0.627		
Treatment 2: piece-rate	0.02	0.397	0.03	0.114
Monthly average number of new secured micro-loans to women owned SMEs				
Treatment 1: contest	0.02	0.427		
Treatment 2: piece-rate	-0.01	0.738	-0.03	0.215
Monthly average number of new micro-loans to male owned SMEs				
Treatment 1: contest	0.02	0.811		
Treatment 2: piece-rate	-0.06	0.597	-0.08	0.365
Monthly average number of new unsecured micro-loans to male owned SMEs				
Treatment 1: contest	-0.01	0.713		
Treatment 2: piece-rate	-0.01	0.811	0.00	0.939
Monthly average number of new secured micro-loans to male owned SMEs				
Treatment 1: contest	0.03	0.646		
Treatment 2: piece-rate	-0.05	0.573	-0.08	0.207
Female staff				
Treatment 1: contest	0.00	0.995		
Treatment 2: piece-rate	-0.08	0.222	-0.08	0.255

Columns 1 and 2 show the coefficient estimates and associated p-values for t-tests comparing each Treatment arm to the Control. Columns 3 and 4 show the coefficient estimates and associated p-values for a t-test comparing Treatment 2 to Treatment 1.

The error terms are clustered by branch.

Table A.3. Balance checks at branch level for Phase 2 of Study 2 (SME Lending Contest)

	Relative to Control Coefficient	p-value	Relative to Treatment 1 Coefficient	p-value
Monthly average number of new micro-loans				
Treatment 1: contest	-1.03	0.566		
Treatment 2: piece-rate	0.97	0.554	2.01	0.246
Monthly average number of new unsecured micro-loans				
Treatment 1: contest	-0.62	0.283		
Treatment 2: piece-rate	0.22	0.772	0.84	0.218
Monthly average number of new secured micro-loans				
Treatment 1: contest	-0.41	0.777		
Treatment 2: piece-rate	0.75	0.473	1.16	0.382
Monthly average number of new micro-loans to women owed SMEs				
Treatment 1: contest	-0.19	0.648		
Treatment 2: piece-rate	0.28	0.490	0.46	0.243
Monthly average number of new unsecured micro-loans to women owned SMEs				
Treatment 1: contest	-0.10	0.506		
Treatment 2: piece-rate	0.05	0.804	0.15	0.394
Monthly average number of new secured micro-loans to women owned SMEs				
Treatment 1: contest	-0.09	0.779		
Treatment 2: piece-rate	0.23	0.365	0.32	0.263
Monthly average number of new micro-loans to male owned SMEs				
Treatment 1: contest	-0.68	0.615		
Treatment 2: piece-rate	0.71	0.534	1.40	0.269
Monthly average number of new unsecured micro-loans to male owned SMEs				
Treatment 1: contest	-0.39	0.335		
Treatment 2: piece-rate	0.19	0.693	0.57	0.163
Monthly average number of new secured micro-loans to male owned SMEs				
Treatment 1: contest	-0.30	0.792		
Treatment 2: piece-rate	0.52	0.505	0.82	0.431
Number of staff (as of June 2023)				
Treatment 1: contest	0.06	0.977		
Treatment 2: piece-rate	1.63	0.443	1.57	0.407

Number of sales agents (as of June 2023)				
Treatment 1: contest	0.19	0.926		
Treatment 2: piece-rate	1.41	0.476	1.22	0.483
Number of branch managers (as of June 2023)				
Treatment 1: contest	-0.13	0.582		
Treatment 2: piece-rate	0.22	0.293	0.35	0.100
Number of rookies (as of June 2023)				
Treatment 1: contest	-0.13	0.868		
Treatment 2: piece-rate	2.27	0.032	2.40	0.024
Number of most improved sales agents (as of June 2023)				
Treatment 1: contest	0.50	0.709		
Treatment 2: piece-rate	-0.53	0.621	-1.03	0.449

Columns 1 and 2 show the coefficient estimates and associated p-values for t-tests comparing each Treatment arm to the Control. Columns 3 and 4 show the coefficient estimates and associated p-values from a t-test comparing Treatment 2 to Treatment 1. The error terms are clustered by branch.

Table A.4. Balance checks at lending agent level for Phase 2 of Study 2 (SME Lending Contest)

	Relative to Control		Relative to Treatment 1	
	Coefficient	p-value	Coefficient	p-value
Monthly average number of new micro-loans				
Treatment 1: contest	-0.11	0.438		
Treatment 2: piece-rate	0.01	0.929	0.12	0.416
Monthly average number of new unsecured micro-loans				
Treatment 1: contest	-0.05	0.208		
Treatment 2: piece-rate	0.02	0.647	0.07	0.184
Monthly average number of new secured micro-loans				
Treatment 1: contest	-0.06	0.618		
Treatment 2: piece-rate	-0.01	0.807	0.05	0.687
Monthly average number of new micro-loans to women owed SMEs				
Treatment 1: contest	-0.02	0.473		
Treatment 2: piece-rate	-0.01	0.644	0.01	0.711
Monthly average number of new unsecured micro-loans to women owned SMEs				
Treatment 1: contest	-0.02	0.233		
Treatment 2: piece-rate	-0.01	0.655	0.01	0.568
Monthly average number of new secured micro-loans to women owned SMEs				
Treatment 1: contest	-0.00	0.862		
Treatment 2: piece-rate	-0.00	0.892	0.00	0.928
Monthly average number of new micro-loans to male owned SMEs				
Treatment 1: contest	-0.06	0.582		
Treatment 2: piece-rate	0.03	0.579	0.09	0.386
Monthly average number of new unsecured micro-loans to male owned SMEs				
Treatment 1: contest	-0.01	0.707		
Treatment 2: piece-rate	0.04	0.253	0.05	0.155
Monthly average number of new secured micro-loans to male owned SMEs				
Treatment 1: contest	-0.05	0.597		
Treatment 2: piece-rate	-0.00	0.951	0.05	0.601
Female staff				
Treatment 1: contest	0.07	0.324		
Treatment 2: piece-rate	0.08	0.249	0.01	0.746

Columns 1 and 2 show the coefficient estimates and associated p-values for t-tests comparing each Treatment arm to the Control. Columns 3 and 4 show the coefficient estimates and associated p-values for a t-test comparing Treatment 2 to Treatment 1.

The error terms are clustered by branch.

7. Administrative information

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