J-PAL
ABDUL LATIF JAMEEL POVERTY ACTION LAB

Loans and grants for microenterprises in Egypt

Randomization Design

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This case study is based on: Crépon, Bruno, Mohamed El Komi, and Adam Osman. "Is It Who You Are or What You Get? Comparing the Impacts of Loans and Grants for Microenterprise Development." *American Economic Journal: Applied Economics* (conditionally accepted), July 2022.

J-PAL thanks the authors for allowing us to use their paper as a teaching tool.

TERM	DEFINITION
Unit of randomization	The level of observation (e.g., individual, household, school, village) at which treatment and comparison groups are randomly assigned.
Random assignment	Taking a pool of eligible units-–persons, schools, villages, firms–-and then allocating those units to treatment and comparison groups by means of a random process such as a toss of a coin, a random number generator, or a lottery.
Random sampling	Selecting units from a population of interest in a randomized manner to create a sample that is representative of the population.
Treatment assignment	An individual's treatment assignment is the group they were randomly assigned to: were they assigned to the treatment group or the comparison group? Note that whether a unit/individual actually receives the treatment will depend on compliance with their treatment assignment.
Stratification	Dividing units in your sample into different subgroups based on specific characteristics (e.g., gender, urban/rural) and then randomizing within those groups to ensure balance on these characteristics.
Internal validity	The extent to which one can be confident that the measured impact is an unbiased estimate of the true impact.
Heterogeneous treatment effects	A treatment can affect different groups of people in different ways. For example, women and men may respond differently to the same treatment. Heterogeneous effects occur when the treatment effect differs across different groups. We can analyze the effect of the treatment within each group to see which groups are likely to have bigger or smaller effects.

Learning objectives

This case study explores how to determine an appropriate randomization strategy to answer multiple research questions and how to design an experiment to measure differential effects across groups.

Subjects covered

Evaluation design, randomization design, level of randomization, multiple treatments, heterogeneous effects

Background on loan and grants for microenterprise development in Egypt

Many policymakers are interested in entrepreneurship as a potential pathway out of poverty. An ongoing policy debate centers around the best way to provide capital assistance to microentrepreneurs in low- and middle-income countries: microcredit, unrestricted cash grants, or in-kind grants of specific items. Furthermore, the returns for microentrepreneurs may differ by characteristics like gender, education, and experience.

To inform this policy issue, researchers conducted a randomized evaluation to measure the impact of providing loans, cash grants, or in-kind grants on microentrepreneurs' business decisions, outcomes, and overall welfare in Egypt. This case study will use this evaluation as an example to illustrate randomization design.

Study Context

In recent years, Egyptian policymakers have been focused on increasing youth employment and female labor force participation. While women and men have similar levels of education in Egypt, women experience different societal expectations and discrimination in the labor market, especially in more rural areas. This evaluation took place from 2016-2019 in Qena, a mostly rural state in Upper Egypt with a population of three million inhabitants. The unemployment rate in Qena in 2017 was much higher for women (25 percent) than men (6 percent).

Key Research Questions

The researchers were interested in identifying the most effective type of financial support for microenterprises in Egypt: loans, cash grants, or in-kind grants. While the requirement to pay off a loan (with interest) can be restrictive, the discipline required to make regular payments might make businesses more streamlined and efficient.[1] Cash grants can provide firms with the freedom to invest in opportunities with the highest possible return, but may not be allocated towards income-generating activities due to their flexibility. While in-kind grants seek to address this concern, they can also constrain microenterprises' ability to pivot to high-return activities.

[1]See Armendáriz and Morduch (2010).

The researchers were also interested in examining how the impacts of capital assistance for businesses vary based on microentrepreneur characteristics.

The researchers focused on four key research questions:

1. Are loans an effective way to improve business outcomes?
2. Are grants more effective than loans at improving business outcomes?
3. Are cash grants more effective than in-kind grants at improving business outcomes?
4. Does the effectiveness of capital assistance vary based on microentrepreneur characteristics (specifically, education, income level, and gender)?

The loan and grants randomized evaluation

In order to identify the most effective way to help microenterprises in Egypt, researchers partnered with the Sawiris Foundation and three local microfinance institutions to design and conduct a randomized evaluation to measure the impact of different types of capital assistance. The study targeted young people between 21 and 35 who had a reasonable business plan for either a new or an existing business. The microfinance institutions screened loan applicants to determine who qualified and then randomized the offer of capital assistance within the group of approved applicants.

Eligible applicants were randomly assigned within each geographic area to one of four groups (also illustrated in Figure 1)[2]:

1. **Loan**: Individuals were offered a loan of the amount they requested. The loan had to be repaid within 10-12 months at an average annual interest rate of 15-24 percent.
2. **Cash grant:** Individuals were offered a cash grant of the amount they requested. They were informed that the cash grant did not have to be repaid and were encouraged, but not required, to use the grant to advance the business objectives they outlined in their loan application.
3. **In-kind grant**: Individuals were offered items outlined in their loan application (going with loan officers to the market to purchase the items) and were informed that they did not need to repay any portion of the grant.

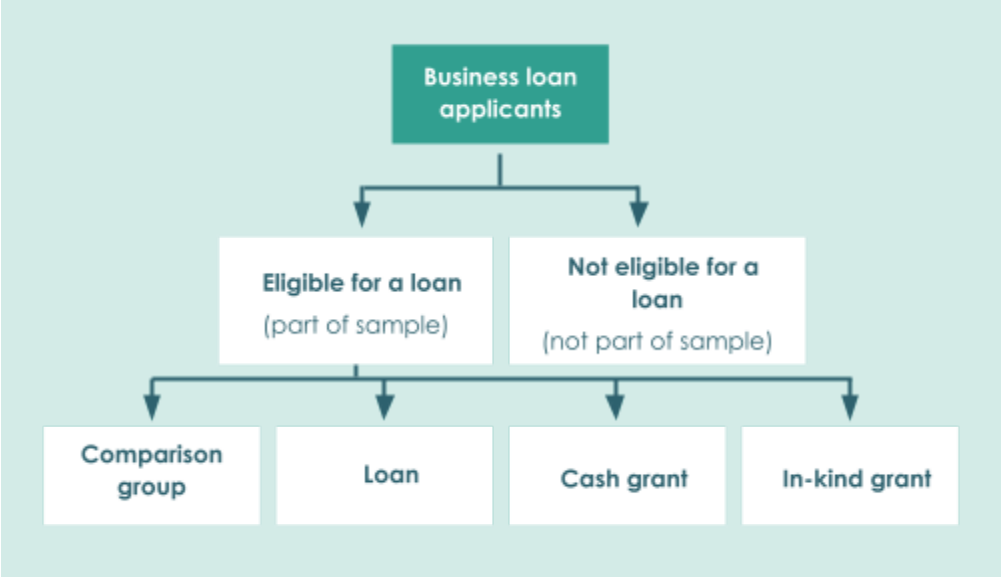
[2] The loan officers recruited the sample over time by recruiting a batch from an area and then moving to the next location. Randomization happened at the individual level within each batch.

4. **Comparison group**: Individuals were not offered any type of capital assistance (loan, cash grant, or in-kind grant).

The average loan or grant value was roughly 2400 Egyptian Pounds ($750 based on the purchasing power parity at the time of the study). As randomization took place after people applied and were approved for a loan, the loans and grants had high take-up rates. Because many participants were starting a business for the first time, participants assigned to the loan, cash grant, and in-kind grant groups also received an eight-hour business training course over two days.

Researchers conducted in-person follow-up surveys on average 16 months after participants received the loan or grant. They collected data on business ownership, sources of income, employment outcomes, and time-use to evaluate the impact of receiving a loan or a grant.

Figure 1: Experimental Design



Addressing Multiple Research Questions through Experimental Design

Discussion Topic 1: Selecting the sample and Unit of Randomization

1. Why do you think the researchers screened individuals who applied for a loan on the basis of their eligibility for microcredit and randomized only among individuals who were approved for a loan?

2. Why do you think that the researchers chose to randomize at the individual level? Explain why this would be an appropriate unit of randomization.

3. The microfinance institutions recruited loan applicants over time by going to different geographic areas, and the individual-level randomization took place by geographic cohort. Why do you think that the researchers chose to stratify randomization by batch from a particular region? (Optional)

Discussion Topic 2: Randomization Strategy

The loans and grants study in Egypt combined assessed multiple interventions under one evaluation: loan, cash grant, and in-kind grant. In order to be able to detect the effect of each intervention, it is important to randomize in a way that creates treatment and comparison groups where the only systematic difference between the groups is the intervention of interest.

In this discussion topic, we will consider how different potential research questions—some similar to those asked in the research study and some different—could be answered with different research designs and randomization strategies.

For each research question below, consider what research design and randomization strategy we could use to answer the research question.[3] Specifically, consider which groups to randomize individuals into to be able to answer the research question. Assume that the study sample is identical to that in the research study: all individuals who were approved for a loan and that randomization is conducted at the individual level.

In the next discussion topic, we will explore how multiple research questions could be answered simultaneously using a single randomized evaluation.

[3] Note that the research questions in this section might differ from the research questions in the original study. The exercise is thus not to identify the study design of the original study, but to consider relevant study designs for different possible research questions.

1. **Research Question 1:** What is the impact of providing a loan to microentrepreneurs on their business outcomes?

Treatment Group(s):	**Comparison Group:**

2. **Research Question 2:** Are grants more effective than loans at improving microentrepreneurs' business outcomes?

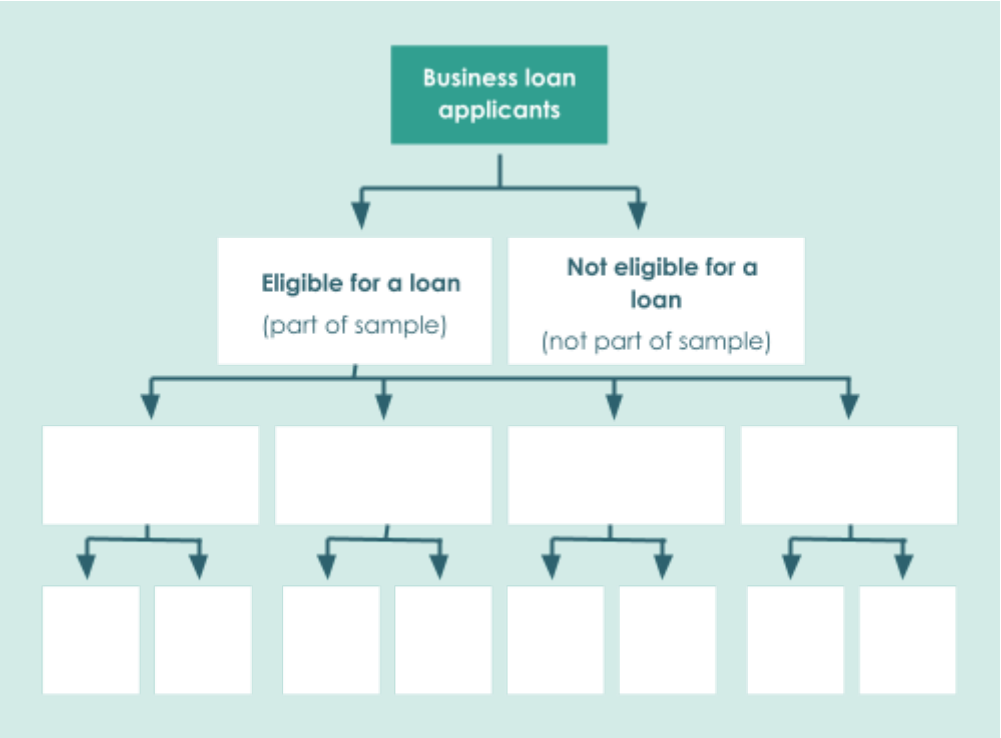
Treatment Group(s):	**Comparison Group:**

3. **Research Question 3:** Are the effects of capital assistance on business outcomes higher among those who are provided with business training than for those who are not?

Treatment Group(s):	**Comparison Group:**

Discussion Topic 3: Addressing multiple research questions with one design

1. Could a single research design answer research questions 1-3 at the same time? HINT: To include research question 3, you can consider a factorial design.
    a. **Research Question 1:** What is the impact of providing a loan to microentrepreneurs on their business outcomes?
    b. **Research Question 2:** Are grants more effective than loans at improving microentrepreneurs' business outcomes?
    c. **Research Question 3:** Are the effects of capital assistance on business outcomes higher among those who are provided with business training than for those who are not?

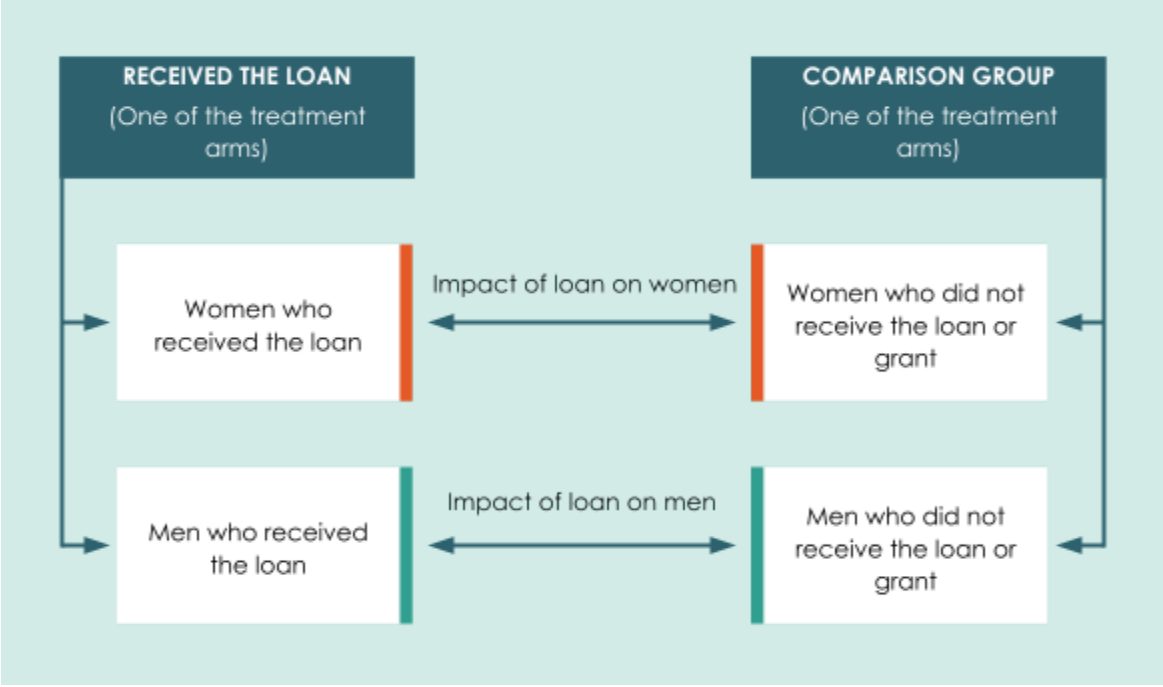


2. What are some tradeoffs to consider for a design with multiple treatment variations versus a simpler design with one treatment and one comparison arm? Consider the implications the chosen study design will have for our analysis.

Discussion Topic 4: Heterogeneous effects

An intervention can affect different groups of people in different ways. For example, we might expect the impact of business loans to vary based on business owners' gender. There are several ways to test for and measure these heterogeneous treatment effects. The figure below shows how we might examine the differential impact of a loan for women versus men for the study in Egypt.

Figure 2: Heterogeneous Effects of a loan among women and men



1. Beyond gender, what are some of the dimensions across which you would expect to see variation in the effects of loans or grants in the Egypt study?

2. Why do you think it would be valuable to compare treatment effects across different characteristics?

3. What do we need to consider for the evaluation design to be able to test the effect of the program among people with different baseline characteristics?

Results of the Study

The researchers found that 16 months after randomization, all three forms of capital assistance led to large increases in business assets and profits relative to the comparison group. The researchers argue that this result showcases that all three types of capital assistance can perform well in contexts with high returns to capital and binding credit constraints. While all three types of capital assistance led to similar increases in total income, the mechanism for this differs between the types of assistance: while in-kind grants substantially outperform cash grants and loans in increasing business profits, cash grants, and loans have positive impacts on wage employment.

Furthermore, the researchers found that the effects of all three types of capital assistance on income were greater for women than for men. To explore the mechanism behind this result, the researchers use time-use data and show that although all three types of assistance led to an increase in time spent in self-employment, women are more likely to switch out of uncompensated chores and child care while men are more likely to switch out of wage activities.

Finally, the researchers found that participants who were at the top of the income distribution before receiving capital assistance were more likely to benefit from the program than those at the bottom of the income distribution. The researchers argue that this result, combined with the result that all three types of capital assistance were equally effective at improving income, provides evidence that "who you are" is more important than "what you get," which is the title of their research article.

Applications to Other Contexts

While we focus on a specific example from Egypt in this case study, both the evaluation design and its findings have relevance to broader contexts. Microcredit and loans have been used across many low- and middle-income countries to encourage business ownership, and the effects can vary widely based on the flexibility of the contract (J-PAL 2018).

Examining differential impacts by gender is an important aspect of this study that has relevance across contexts. Women often face different financial and social constraints than men, but whether capital assistance leads to economic empowerment hinges on whether women are able to maintain control over the use of funds (J-PAL 2021, Riley 2022).

Crépon, El Komi, and Osman's (2022) findings also have implications for targeting capital assistance. While the authors found that all three types of capital assistance improved business outcomes, especially for women, these impacts were concentrated among the recipients who had the highest income *before* participating in the study. This suggests that microcredit and grants may be more effective when targeted to high-potential entrepreneurs and that personal characteristics are more important than the type of assistance in determining effectiveness. However, the context and timing can also impact the firm outcomes. Grimm, Soubeiga, and Weber (2021) applied these learnings by providing loans to winners of a business plan competition in Burkina Faso with modest results, in part due to the Covid-19 pandemic. In a follow-up analysis of seven microcredit evaluations, Meager (2016) found that households with existing businesses were able to expand operations and increase total consumption.

Armendáriz, Beatriz and Jonathan Morduch. 2010. "The Economics of Microfinance", Second edition, Vol. 1. MIT Press.

Bauchet, Jonathan, Cristobal Marshall, Laura Starita, Jeanette Thomas, and Anna Yalouris. 2011. "Latest Findings from Randomized Evaluations of Microfinance." Access to Finance Forum.

Crépon, Bruno, Mohamed El Komi, and Adam Osman. "Is It Who You Are or What You Get? Comparing the Impacts of Loans and Grants for Microenterprise Development." *American Economic Journal: Applied Economics* (conditionally accepted), July 2022.

Duflo, Esther, Rachel Glennerster, and Michael Kremer. 2008. "Using Randomization in Development Economics Research: A Toolkit." T. Schultz and John Strauss, eds., Handbook of Development Economics. Vol. 4. Amsterdam and New York: North Holland.

Fang, Albert. n.d. "10 Things to Know About Heterogeneous Treatment Effects." EGAP methods guides.

Grimm, Michael, Sidiki Soubeiga, and Michael Weber. 2021. "Short-Term Impacts of Targeted Cash Grants and Business Development Services: Experimental Evidence from Entrepreneurs in Burkina Faso." Policy Research Working Paper Series 9877, The World Bank.

J-PAL. "Impact of Loans and Grants on Microenterprise Growth in Egypt" J-PAL Evaluation Summary.

J-PAL. 2021. "Designing financial services and social protection programs to enhance women's economic empowerment" J-PAL Policy Insight.

J-PAL. 2018. "Microcredit: impacts and limitations" J-PAL Policy Insight.

J-PAL. "Data Analysis" J-PAL Research Resource.

J-PAL. "Randomization" J-PAL Research Resource.

Meager, Rachael. 2019. "Understanding the Average Impact of Microcredit Expansions: A Bayesian Hierarchical Analysis of Seven Randomized Experiments." *American Economic Journal: Applied Economics*, 11 (1): 57-91. doi: 10.1257/app.20170299

Riley, Emma 2022. "Resisting Social Pressure in the Household Using Mobile Money: Experimental Evidence on Microenterprise Investment in Uganda." CSAE Working Paper Series 2022-04, Centre for the Study of African Economies, University of Oxford.

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