

# Access to Finance for MSMEs in Ecuador

## A Firm-Level Impact Evaluation

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## Abstract

This paper studies the impact of a World Bank program aimed at promoting access to finance for micro, small, and medium-size enterprises in Ecuador. A staggered difference-in-differences method is used to estimate the impact of the program on 2,035 participant firms during 2019–23.

The findings show that the program had a positive effect on these firms, by boosting their financing, number of workers, short-term assets, and sales. This effect is similar when enterprises are female-led and is larger for firms that had no previous access to finance.

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# **Access to Finance for MSMEs in Ecuador: A Firm-Level Impact Evaluation**

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## 1. Introduction

Micro, small, and medium-size (MSME) programs, most prominently those providing training or credit, are ubiquitous in economies worldwide. While the effect of training on MSME performance has been studied extensively, including through meta-analysis (McKenzie and Woodruff, 2014, and McKenzie 2021), evidence on credit interventions is more limited. Yet, governments often channel substantial funds to these programs. This raises an important question: How effective are programs designed to expand MSME access to financing, and to what extent does greater credit availability translate into tangible business growth?

We shed light on this question by studying the effect of a loan program<sup>1</sup> in Ecuador on the financing and growth of participating MSMEs. The program was implemented by the development bank *Corporación Financiera Nacional* (CFN) with World Bank funding. As a second-tier lender, CFN extended credit lines to participating financial institutions from 2021 to 2024, which then screened and selected MSMEs to receive loans funded by the program. As of February 2025, 22 financial institutions issued loans to 23,667 MSMEs, totaling more than USD 500 million.

To measure the impact of the program, we exploit its differential roll-out over time, along with annual data for 2019 to 2023, covering 2,035 formal firms participating in the program.<sup>2</sup> This paper hence measures the impact of the program on beneficiary firms until 2023. Our identification strategy relies on Callaway and Sant’Anna’s (2021) staggered difference-in-differences approach, comparing observations after participating in the program with not-yet-treated observations.

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<sup>1</sup> The loan program was named “Promoting Access to Finance for Productive Purposes for MSMEs” and registered under the World Bank project code P172899.

<sup>2</sup>The other program recipients were mainly self-employed individuals, who are not included in the data we use. Because these are different types of firms, it is uncertain if the results of this paper would apply to them.

We find that the program effectively increased firms' overall financing by 26 percent. Firms used the additional funds to hire more workers, resulting in an 8.9 percent increase in employment, and to expand investments in short-term assets, which grew by 17 percent. These changes contributed to a 52.8 percent increase in sales. Importantly, the results show that the expanded financing and growth resulting from the loan program were not exclusive to firms owned by men. Instead, we find similar effects for both men- and women-owned firms.

Given that firms with no prior access to credit were a key group targeted by the program, we examine the effects of the program on these firms separately.<sup>3</sup> We find that this set of firms experienced greater benefits from the program, increasing their employment from 9 to 11.5 workers (i.e., 28 percent increase), expanding their short- and long-term assets by 86 and 142 percent, respectively, and almost doubling their sales (i.e., a 97 percent increase). For firms with existing credit, the program did not increase overall borrowing but allowed them to substitute more expensive financing sources. However, selection patterns suggest that financial institutions prioritized larger, less credit-constrained firms when allocating loans. This highlights a common challenge in financial sector interventions—balancing financial inclusion objectives with financial institutions' commercial incentives.

The remainder of this paper is organized as follows: The next section offers background on Ecuador's macroeconomic context and financial sector, along with a detailed description of the World Bank's project under analysis in this paper. Section 3 provides a detailed description of the data used in the study. Section 4 explains the selection process for firms participating in the

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<sup>3</sup> We select firms that had no access to credit before the program during the period under analysis.

program. Section 5 outlines the econometric approach, and Section 6 presents the results of our estimates. Final conclusions are presented in Section 7.

## **2. Background**

### *2.1 Ecuador's Macroeconomy and Financial Sector*

The project funds were disbursed amid several macroeconomic shocks in Ecuador: the COVID-19 pandemic crisis, followed by a political crisis that led to a national strike in June 2022 and eventually a change in the presidency in November 2023, a sustained increase in crime levels and insecurity that led to the declaration of an internal armed conflict in January 2024, and a severe energy crisis that forced prolonged power rationing in the last quarter of 2024.

In parallel, the relatively low sovereign spread seen between April 2021 and June 2022 posted a steep increase, leaving the Government of Ecuador without fiscal space to finance its deficit. Ecuador had to resort to budget support from various international financial institutions (IFIs) in 2024. Given that since 2000 Ecuador has been dollarized, and hence, lacks a lender of last resort, the fiscal situation drained resources from the local financial system, whose liquidity later saw improvements with the disbursements from IFIs.

Credit provision in Ecuador is led by banks and credit cooperatives. As of December 2024, private banks held 65.3 percent of total assets (USD 68.9 billion), followed by credit cooperatives and mutual lenders, which accounted for 26.5 percent (USD 27.9 billion), and state-owned financial institutions, which control 8.2 percent (USD 8.7 billion).<sup>4</sup> Financial institutions mostly

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<sup>4</sup> These figures exclude the social security bank BIESS and count Banco del Pacifico (which is fully owned by CFN) as a private commercial bank.

provide traditional products, with limited services for underserved and financially excluded segments.

All loans issued by banks and credit cooperatives in Ecuador are subject to a maximum interest rate cap, which has at different times been binding—meaning that the market rate reaches the regulatory cap—and varied across seven distinct credit segments. The first two segments—productive credit and microcredit—are intended for financing productive and commercial activities. While productive credit refers to credit granted to individuals or legal entities with annual sales exceeding USD 300,000, microcredit refers to loans for individuals, legal entities, or a group of borrowers with joint liability with annual sales of USD 300,000 or less. The remaining five segments include consumption loans, loans for education, loans for public or social interest housing, loans for real estate, and loans for public investment.

In 2019, the International Monetary Fund’s (IMF) Financial Development Index ranked Ecuador 133rd of 192 countries, the lowest among countries with a similar level of development. Despite significant advances in access indicators in the past years, including the reduction of gender and income gaps, Ecuador lags its regional peers. The recent rapid growth of credit has been uneven across different segments, with credit to the productive sector losing ground to consumer credit, partly explained by the negative incentives of the interest rate control scheme (IMF 2023; World Bank 2024). According to the 2023 Financial Sector Assessment Program (FSAP), the interest rate cap scheme limits financial inclusion and competition and distorts the selection of borrowers, which is particularly harmful to the productive segment (IMF 2023, World Bank 2024).

## *2.2 The World Bank Project*

In July 2020, the World Bank’s Board of Executive Directors approved the “*Promoting Access to Finance for Productive Purposes for MSMEs*” Project to CFN with an International Bank for Reconstruction and Development (IBRD) loan of USD 260 million. The Project aimed at reducing credit barriers among MSMEs. On May 9, 2023, an additional financing of USD 300 million was approved to increase the scope of the project.<sup>5</sup> As of mid-April 2025, the World Bank’s Project had disbursed a total of USD 555 million, representing 99 percent of the total loans.

The Project aimed to tackle a series of challenges faced by CFN that limited the entity's ability to support the productive sector, including: i) an unsustainable financing structure, with an estimated financing gap of USD 210 million in 2020; ii) poor corporate governance; iii) conflicting performance objectives; and iv) poor quality of its first-tier loan portfolio.

The Project included two key components: (1) technical assistance for strengthening CFN’s institutional capacity, and (2) a second-tier credit line for MSME loans (USD 513 million from IBRD, and USD 30 million in private capital mobilization from participating financial institutions).<sup>6</sup> With this second component, CFN completely pivoted its focus to second-tier lending.<sup>7</sup> As illustrated in Figure 1, CFN lends the World Bank funds to private financial institutions (commercial banks and cooperatives), under the condition that these institutions grant loans to MSMEs (defined as individuals or legal entities with annual sales up to USD 7 million).

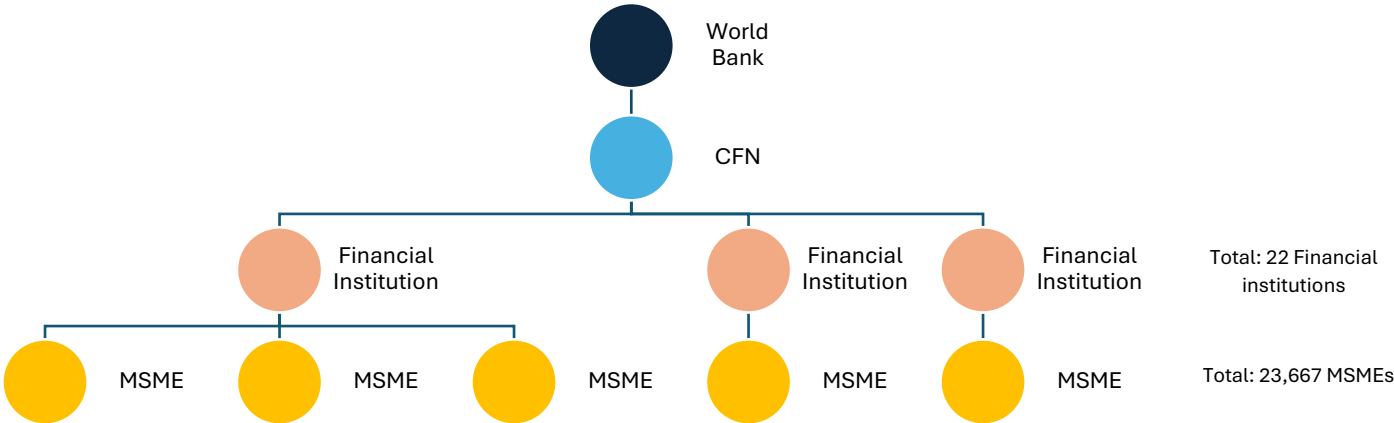
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<sup>5</sup> For more details, see World Bank - Project Appraisal Document (2020) and Project Paper (2023).

<sup>6</sup> Additional components of the project were the technical strengthening and capitalization of a national guarantee fund managed by CFN.

<sup>7</sup> A presidential decree in 2024 changed CFN's mandate to focus exclusively on second-tier operations. The approval of the reform to the Organic Statute by Processes and the comprehensive reform to CFN's Social Statute in February 2025 were milestones in its institutional strengthening process. Regarding the quality of its assets, CFN is in the process of liquidating its problematic first-tier legacy portfolio, while its growing second-tier portfolio does not present any delinquency from any financial institution. In terms of funding structure, CFN shifted towards financing from IFIs, which went from 7 percent of total liabilities in December 2020 to 36 percent in December 2024.

**Figure 1: Second-Tier Lending Scheme Adopted in the Project**



In December 2024, 22 financial institutions participated in the second-tier credit program, including some of the main private commercial banks in the country. Financial institutions had granted loans to 23,667 MSMEs through the program. Based on 2023 data, the loans granted through the program represented 7.7 percent (USD 98.7 million) of total outstanding loans from financial institutions to small firms. Similarly, the project provided 7.8 percent (USD 180.9 million) of total outstanding loans to medium firms. The total outstanding amount for micro firms is not available, due to more lenient reporting requirements and the common practice of combining personal and micro loans. Currently, around USD 200 million in loans are still pending reporting, which will further underscore the key role of CFN in lending to these segments.

The participation of financial institutions in the second-tier credit program increased gradually over time. At the beginning of the project, CFN had to regain the trust of the local financial system as a second-tier operator. For this reason, the first two years of the project were led by small banks and cooperatives. In December 2021, the program had disbursed USD 81.2

million to small financial entities. Large banks finally joined the project in 2022, leading to a significant increase in disbursements to USD 213 million in December 2022. This exhausted the total resources of the credit line and prompted the preparation of an additional financing IBRD loan for USD 300 million. With the approval of this additional financing in May 2023, CFN once again had resources for the credit line. However, disbursements that year were affected by the deteriorating political context and a new CFN administration resulting in only USD 10 million being disbursed during the year. In 2024, another change in CFN's administration significantly reactivated the project, disbursing USD 290 million to participating financial institutions over the course of the year. The phased disbursements over time to an increasing number of financial institutions motivated our choice of a staggered difference-in-differences methodology for our empirical analysis, which is presented in Section 5.

### **3. Data**

The analysis utilizes annual information from the Directory of Companies of the Superintendencia of Companies, Securities, and Insurance (SCVS), covering 145,548 formal companies operating in Ecuador at any time between 2019 and 2023. The dataset provides detailed information about these firms, including their 6-digit economic sector, region, revenues, number of workers, official size classification (grouping firms into micro, small, medium, or large), and various financial and operational performance variables. Since the coverage includes only formal firms, there are few micro firms in the data.

Of all the companies in the database, 2,035 were identified by CFN as having received loans from the program between 2021 and 2024.<sup>8</sup> While the program had about 15,000 additional recipients, these were mostly self-employed individuals, who are not included in the Directory of Companies. For program recipients in the database, CFN also added a variable to identify firms led by women, which is not available in the Directory of Companies. To proxy gender for the other firms, CFN provided a list of managers' names, which we used to identify firms led by women.

We defined six outcomes of interest as follows. First, we used the total outstanding debt with financial institutions to examine if the loan program effectively increased firms' access to formal credit.<sup>9</sup> To evaluate the effect of the program on job creation, our second outcome was the number of workers, which we measured in logs. Our next two outcomes helped us study the impact of the program on the accumulation of short- and long-term assets. We analyzed these variables separately, as firms in the sample mostly relied on short-term assets. For example, the ratio of short-term assets to total assets of the average firm in the sample is 0.76, and it is 0.99 for the median firm. Our last two outcomes examined the impact of the program on sales and profitability, measured by total revenue and operational profits, respectively.

We measure outstanding debt, short-term assets, long-term assets, sales and profits in levels (US dollars) to account for the significant number of observations with zero for these variables, as well as negative values in the case of profits. To reduce noise, we winsorize these variables at the top and bottom 1 percent.

#### **4. Selection into the Program**

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<sup>8</sup> In the sample, most beneficiary firms only obtain one loan from the program. Only 20 percent of firms obtained more than one program loan over the years. While we have data on firms' financials only up until 2023, we can identify the list of beneficiary firms up until 2024. However, we do not have data on firms' financials for 2024. This allows us to include firms that benefited from the project in 2024 in the control group.

<sup>9</sup> In the data set, this information is not disaggregated at the financial institution level.

This section compares the 2,035 formal firms that participated in the program to other such firms in Ecuador. This analysis sheds light on whether the program went to its intended recipients, as far as we can deduce based on the subset of participants in our data. It also helps us define the identification strategy to measure the effects of the program.

We start by showing the distribution of firms across sectors for the full sample of firms and for program beneficiaries (Table 1). Most firms in both samples belong to the wholesale and retail trade sectors. However, when compared to the full sample, beneficiary firms tend to be overrepresented in the wholesale and retail trade (+12.33 percentage points (p.p.) for beneficiary firms compared to the full sample) and manufacturing (+8.19 p.p.) sectors, while they tend to be underrepresented in the real estate (-4.81 p.p.) and the professional, scientific and technical activities (-4.59 p.p.) sectors. Except for these differences, the distribution of firms across the remaining sectors is similar in both samples.

**Table 1. Sectoral Distribution of Firms, All and Beneficiary Firms (2019-2023)**

Sector	All Firms	Beneficiary Firms	Difference (p.p.)
Agriculture, Livestock, Hunting, and Related Activities	4.12%	6.00%	-1.88%
Forestry and Logging	0.28%	0.16%	0.12%
Fishing and Aquaculture	1.80%	2.86%	-1.06%
Mining and Quarrying	1.16%	0.41%	0.75%
Manufacturing Industries	6.92%	15.11%	-8.19%
Electricity, Gas, Steam, and Air Conditioning Supply	0.62%	0.39%	0.23%
Water Supply; Sewerage, Waste Management, and Remediation Activities	0.48%	0.57%	-0.09%
Construction	8.57%	4.36%	4.21%
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	23.27%	35.60%	-12.33%
Transportation and Storage	12.03%	10.48%	1.55%
Accommodation and Food Service Activities	2.31%	2.54%	-0.23%
Information and Communication	4.64%	3.59%	1.05%
Financial and Insurance Activities	2.37%	0.17%	2.20%
Real Estate Activities	6.08%	1.27%	4.81%
Professional, Scientific, and Technical Activities	12.72%	8.13%	4.59%
Administrative and Support Service Activities	7.09%	3.78%	3.31%
Education	1.82%	1.07%	0.75%
Human Health and Social Work Activities	2.48%	2.85%	-0.37%
Arts, Entertainment, and Recreation	0.65%	0.16%	0.49%
Other Service Activities	0.59%	0.49%	0.10%

Notes: The table presents the sectoral distribution of firms, both for the 145,548 formal companies in the Directory of Companies (Column 1), as well as for the 2,035 firms that obtained a program loan. The third column displays the difference in sectoral shares between the two groups of firms.

Next, we ask how different firm characteristics predict selection into the program. Here, we run an OLS regression for all firms that operated during the pre-program period.<sup>10</sup> Each observation represents one firm, with the dependent variable being the probability of obtaining a loan from the program. We include different sets of covariates, to study how they predict the probability of participating in the program, controlling for the other characteristics.

The first set of covariates examines if the program effectively targeted the intended recipient firms, namely firms led by women, firms with less access to bank credit, and MSMEs. To identify firms with low credit access, we create an indicator variable that equals one if the total outstanding debt of a firm with financial institutions was zero in both 2019 and 2020, and zero otherwise. The remaining covariates are our six outcomes of interest averaged for each firm over the pre-program years.

The results, displayed in Table 2, indicate that banks effectively prioritized firms led by women for the credit line, as these firms had a higher probability of participating in the program. However, banks did not target credit constrained firms since those with prior bank credit had a higher likelihood of obtaining a loan through the program. These results remain robust even after controlling for fixed effects at the sector and region levels.

Consistent with large firms being excluded from the program, the likelihood of obtaining a loan is greater for firms classified as micro, small, or medium size. Large firms are the omitted category in the regression, implying that the coefficients on the other size categories are relative to large firms. Among all size categories, medium size firms are the ones most likely to participate in the program.

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<sup>10</sup> We estimate all regressions using ordinary least squares. We chose a linear probability model since it is simpler than a nonlinear model and tends to yield similar marginal effects as a nonlinear model (Angrist and Pischke 2009).

In summary, these findings suggest that while the program effectively excluded the largest firms and was directed towards firms led by women, banks strategically selected larger MSMEs and those with more available information (i.e. those with prior loans), which from the perspective of banks, might represent borrowers of better quality. These results are consistent with previous studies that show that financial institutions' incentives may influence the targeting and effectiveness of financial sector programs (Ornelas et al. 2024).

**Table 2. Probability of participating in the loan program**

	(1)	(2)	(3)	(4)
Female	0.007*** (0.001)	0.007*** (0.001)	0.008*** (0.001)	0.008*** (0.001)
Prior loan	0.041*** (0.001)	0.039*** (0.001)	0.024*** (0.001)	0.023*** (0.001)
Medium firm			0.069*** (0.002)	0.065*** (0.003)
Small firm			0.028*** (0.002)	0.024*** (0.003)
Micro firm			0.003* (0.001)	0.001 (0.003)
Outstanding debt				0.000*** (0.000)
Employment				0.005*** (0.001)
Short-term assets				-0.000** (0.000)
Long-term assets				-0.000*** (0.000)
Sales				-0.000*** (0.000)
Profits				0.000*** (0.000)
Constant	0.002*** (0.000)	0.003*** (0.001)	-0.004*** (0.001)	-0.009*** (0.003)
Observations	94,832	94,816	94,816	83,643
R-squared	0.021	0.025	0.041	0.043
Sector FE	No	Yes	Yes	Yes
Region FE	No	Yes	Yes	Yes

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*Note:* The table presents OLS regression estimates predicting the probability of participating in the loan program. Observations are at the firm level for the pre-program periods (2019-2020). The dependent variable is an indicator variable equal to one if the firm obtained a loan from the program in posterior years, and zero otherwise. Covariates are averaged over the pre-program years. Robust standard errors are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

## 5. Identification Strategy

We use a staggered difference-in-differences approach to evaluate the impact of the program. This methodology exploits the fact that due to the phased disbursements of World Bank funding to participating financial institutions, recipient firms were issued loans from the program in different years. Given that selection into the program was not random, using non-recipient firms in the evaluation as a counterfactual of recipient firms' outcomes in the absence of the program would likely bias our results. Therefore, we exclude non-recipient firms from the analysis. The identification strategy compares the outcomes of recipient firms after receiving their first program loan to those of recipient firms that have not yet received such loan. That is, the counterfactual consists of pre-program observations of all firms that would eventually participate in the program.

Table 3 contains the summary statistics for the pre-program years. Of all the recipient firms, 44 percent were led by women and 88 percent had an outstanding debt with a financial institution. While the average outstanding debt of recipient firms prior to the program was USD 173,354, the median firm had an outstanding debt of USD 23,868. There was significant variation among recipient firms in terms of their employment, assets, sales and profits. On average, firms had 17 workers, approximately USD 1 million in short-term assets and sales, and profits of USD 44,947. However, the median firm employed half as many workers and had substantially lower assets, sales and profits compared to the average firm.

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**Table 3. Summary Statistics of Recipient Firms (2019-2020)**

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	Mean	P50	Std Dev	Obs
Female	0.44			3580
Prior loan	0.88			3580
Outstanding debt (USD)	173,354	23,868	373,318	3580
Employment (logs)	2.32	2.08	0.94	3262
Employment (number of workers)	16.95	8.00	23.43	3273
Short-term assets (USD)	590,122	239,745	1,016,994	3580
Long-term assets (USD)	408,301	85,732	960,323	3580
Sales (USD)	1,032,626	602,751	1,223,690	3580
Profits (USD)	44,947	16,658	137,377	3523

Notes: The table presents summary statistics for the period 2019-2020, prior to the launch of the loan program. Each column displays the mean, median, standard deviation, and number of observations for the sample of 2,035 firms that participated in the loan program at any point during the sample period.

We rely on the staggered difference-in-differences estimator proposed by Callaway and Sant’Anna (2021). This estimator allows us to compare the performance of firms after obtaining their first loan from the program with not-yet-treated recipient firms. A key advantage of this method is that it addresses the recently documented limitations of two-way fixed effect (TWFE) models, particularly when the timing of treatment varies and treatment effects are dynamic (Callaway and Sant’Anna 2021; De Chaisemartin and d’Haultfoeuille 2020; Goodman-Bacon 2021; Jakiela 2021; Sun and Abraham 2021).

Equation (1) represents the canonical TWFE regression when timing to treatment varies:

$$y_{it} = \alpha_i + \beta_t + \gamma Treat_{it} + \varepsilon_{it} \quad (1)$$

For each firm  $i$  and year  $t$ ,  $y_{it}$  represents the outcome of interest,  $\alpha_i$  corresponds to fixed effects at the firm level, and  $\beta_t$  are fixed effects at the year level. The variable  $Treat_{it}$  is an indicator variable that equals one if firm  $i$  obtained its first loan from the program in or after year  $t$  and is equal to zero otherwise.  $\varepsilon_{it}$  corresponds to the residuals.

Equation (1) includes “clean” comparisons between treated and not-yet treated firms but also “forbidden” comparisons that can receive negative weights. “Forbidden” comparisons are difference-in-differences that use early-treated firms as a control group. If treatment effects are dynamic, such “forbidden” comparisons can lead to biases and erroneous conclusions about the impact of an intervention (Baker et al. 2022; Goodman-Bacon 2021; Roth et al. 2023). This is because dynamic treatment effects lead to changes in early treated firms after treatment, implying that they are not an unbiased control group.

In our context, these limitations are likely to be present, as we expect the effects of the program to grow over time for several reasons. First, the impact of an investment often takes time to materialize. Additionally, obtaining a loan from the program may pave the way for further financing in the future—whether through additional program loans or an improved credit history that enables firms to obtain additional financing. Diagnostics within our sample of recipient firms indicate that under the TWFE approach, a fraction of treated observations—particularly early recipient firms in later years—is assigned negative weights (Appendix Figure A1).

The main building block of Callaway and Sant’Anna’s (CS) estimator overcomes these limitations by calculating the  $ATT(g, t)$ , defined as the average effect of the program in year  $t$  for the cohort of firms that received their first program loan in each year  $g$ . This estimator uses “clean” comparisons but excludes “forbidden” comparisons from Equation (1). It compares the expected change in outcomes between periods  $g-1$  and  $t$  of two groups: recipient firms in cohort  $g$  and a control group of not-yet-treated recipient firms. The estimated  $ATT(g, t)$  cohort-time parameters can be aggregated using specified weights to obtain the overall average effect of the loan program,

as well as its impact over time. We use the *csdid* command in Stata, as described in Callaway and Sant’Anna (2021).<sup>11</sup>

Similar to the canonical difference-in-differences approach, there are two key identifying assumptions for firms in the control group (i.e., not-yet treated firms) to provide a valid counterfactual for the evolution of outcomes that treated firms would have followed in the absence of the program. The first assumption requires that the average outcomes of firms receiving their first loan from the program at different points in time follow parallel trends in the years prior to participating in the program. The second identifying assumption is that of no anticipation, which implies that the loan program has no causal effect prior to its implementation.

We first examine the factors associated with the timing of participation in the loan program. Table 4 displays regression estimates from ordinary least squares. In all the specifications, observations are at the firm level and the dependent variable is the year when a firm obtained its first loan from the program. We use the same covariates as in Table 2, averaged over 2019 and 2020. All specifications in Table 4 show that female-led firms and firms with lower credit access—proxied by not having an outstanding debt with a financial institution prior to the program—began their participation in the program earlier. The estimated effects of all other firm characteristics are either not statistically significant or zero. We find no evidence that the timing of firm participation in the loan program was systematically driven by the performance of firms prior to the program. This finding suggests that not-yet-treated observations are a valid counterfactual for treated observations.

**Table 4. Factors predicting timing of participation in the loan program**

	(1)	(2)	(3)	(4)
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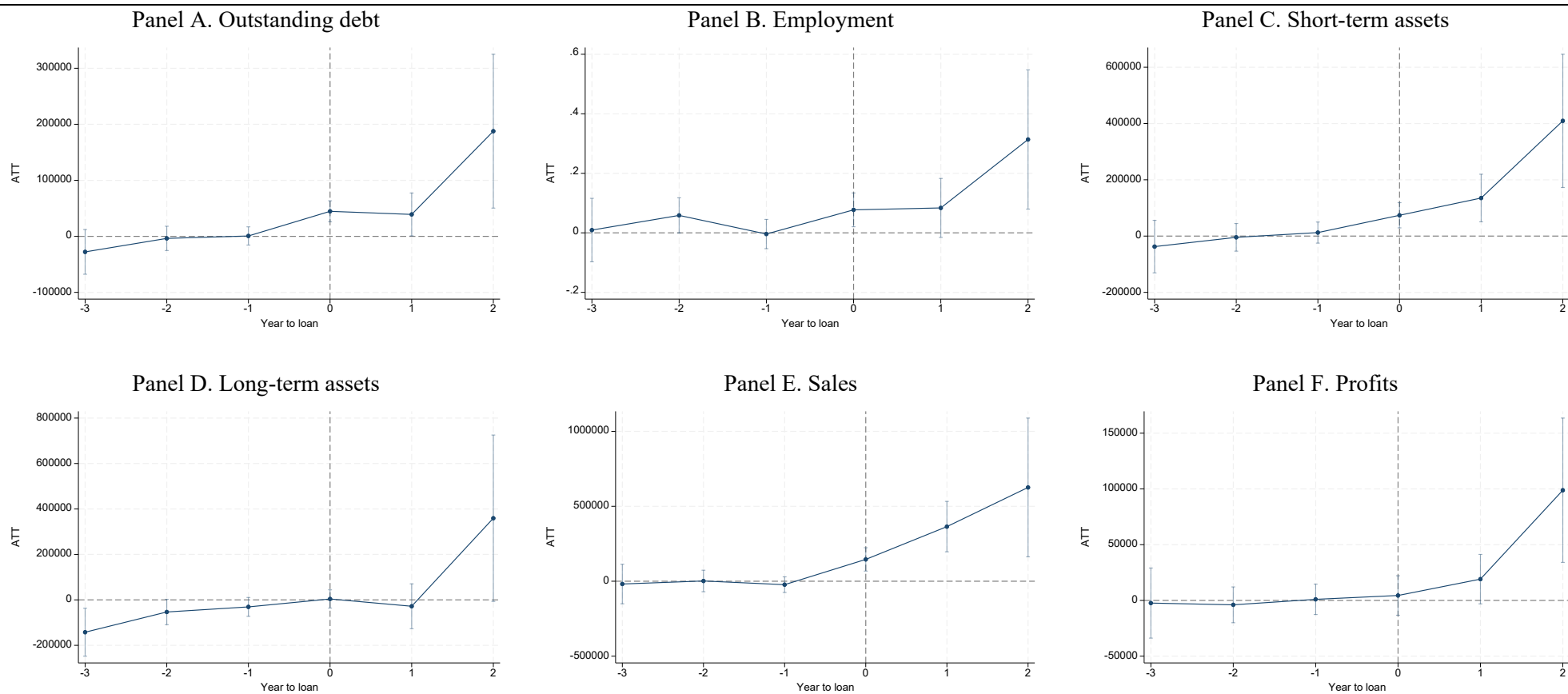
<sup>11</sup> Our preferred specification relies on repeated cross-section estimators as the panel of recipient firms is unbalanced.

Female	-0.158*** (0.044)	-0.143*** (0.046)	-0.146*** (0.046)	-0.150*** (0.048)
Prior loan	0.163*** (0.060)	0.174*** (0.062)	0.213*** (0.065)	0.225*** (0.069)
Medium firm			-0.126 (0.130)	-0.163 (0.189)
Small firm			-0.042 (0.128)	-0.040 (0.214)
Micro firm			0.019 (0.136)	0.022 (0.225)
Outstanding debt				-0.000*** (0.000)
Employment				-0.015 (0.031)
Short-term assets				0.000 (0.000)
Long-term assets				0.000** (0.000)
Sales				0.000 (0.000)
Profits				-0.000 (0.000)
Observations	1,836	1,836	1,836	1,674
R-squared	0.011	0.030	0.033	0.044
Sector FE	No	Yes	Yes	Yes
Region FE	No	Yes	Yes	Yes

Notes: The table presents OLS regression estimates predicting the year of participation of firms in the loan program. Observations are at the firm level. The dependent variable is the year when a firm obtains its first program loan. Firm pre-program characteristics are averaged over 2019 to 2020. Robust standard errors are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

We also plot in Figure 2 the yearly average treatment effects for our outcomes of interest before and after firms began receiving loans from the program. Overall, the impact estimates of outcomes prior to the program are close to zero and do not display a discernable trend, suggesting that both identifying assumptions hold.

**Figure 2. Impact of program loan**



Notes: The figure plots the Callaway and Sant'Anna estimates of the yearly pre and post-loan program effects on our six outcomes of interest. The plots are generated using the *event\_plot* command in Stata, clustering the standard errors at the firm level. The vertical lines correspond to the 95% confidence intervals.

To further corroborate the validity of our empirical strategy, we run chi-squared tests to examine if the yearly pre-loan effects of our outcomes of interest are statistically equal to zero. The first two rows of Panel A of Table 5 display the results. Only one of our outcomes of interest, long-term assets, shows a statistically significant pre-program difference. A closer examination of Panel D in Figure 2 suggests that this difference is observed three years prior to the program. The estimates for all other years prior to the program are close to zero.

## **6. Results**

Panel A of Table 5 presents the overall average treatment effects of the loan program on our outcomes of interest. The estimates in the first column indicate that the program effectively increased firms' overall financing by USD 48,608. That is, the average recipient firm experienced a statistically significant 26 percent increase in financing because of the program. In terms of real activity, the program increased firm employment by 8.9 percent (Column 2), raising the average number of workers per firm from 16.9 to 18.4. The program also enabled recipient firms to accumulate more short-term assets, which increased by USD 109,113 from a pre-program average of USD 641,057 (i.e., a 17 percent increase). Consistent with the fact that most program loans were used to finance working capital or short-term investments, there is no significant effect of the program on the long-term assets of recipient firms (Column 4). As reported in Column 5, the program increased sales by 52.8 percent, representing an increase in sales from USD 458,201 to USD 700,107 for the average firm. Finally, recipient firms participating in the loan program increased their profitability by 1.2 percent. However, this result is not statistically significant in the overall sample of recipient firms. Panels A through F of Figure 2 confirm that the effects of the loan program on our outcomes of interest increased over time. Taken together, our results

indicate that firms used the additional financing from the loan program to hire more workers and expand investments in short-term assets, leading to increased sales.

In Panels B and C of Table 5, we analyze the program effects separately for female- and male-led firms (also see Figures 3 and 4, respectively). Although the estimates are noisier, likely due to the smaller sample sizes, the results suggest that the loan program expanded financing for both groups of firms, enabling them to increase employment, short-term assets, and sales.

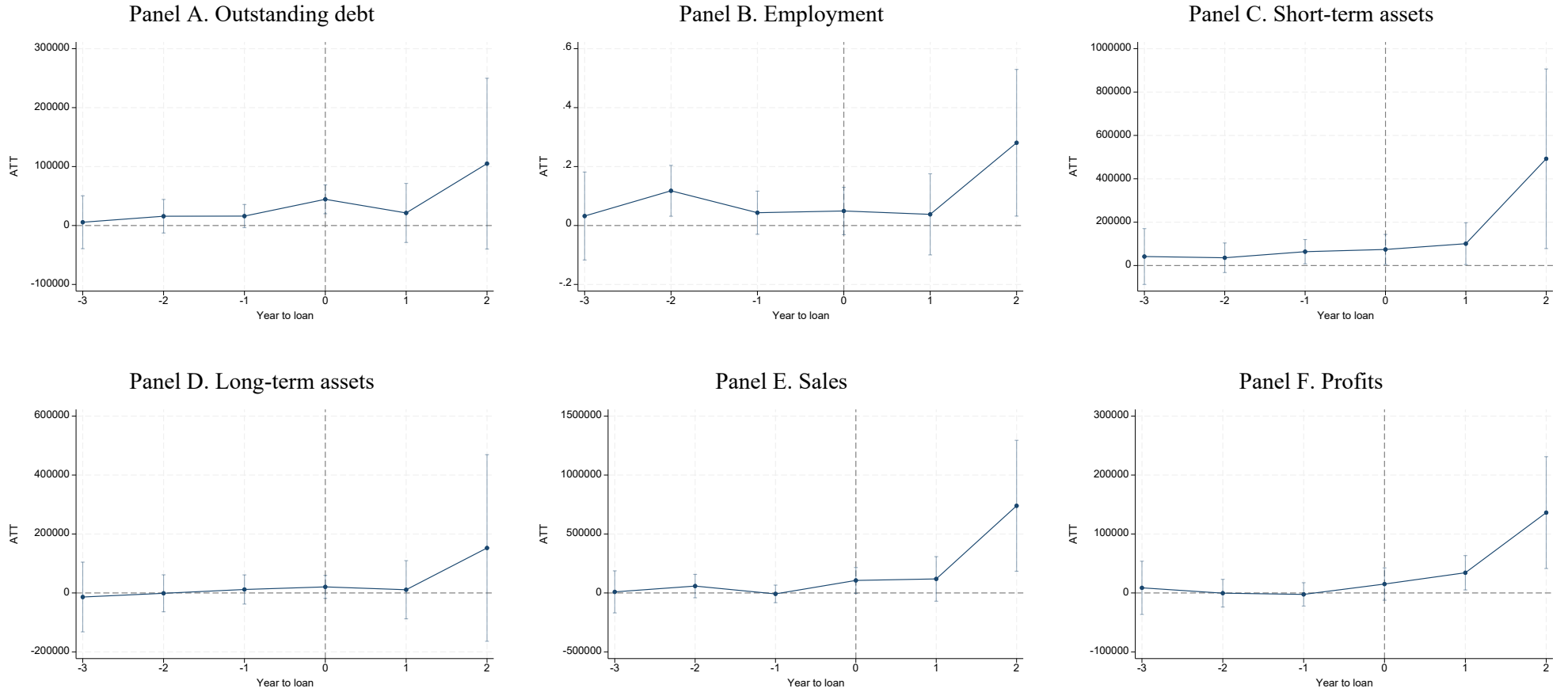
**Table 5. Impact of the loan program on recipient firms**

	(1) Outstanding debt	(2) Employment	(3) Short- term assets	(4) Long- term assets	(5) Sales	(6) Profits
<i>Panel A. All recipient firms</i>						
Pre-pgm diff	-10,250	0.021	-9,815	-75,519	-13,181	-1,782
P-value	0.386	0.488	0.719	0.019	0.721	0.854
Pgm effect	48,608	0.089	109,113	7,444	241,906	13,434
P-value	0.000	0.009	0.000	0.823	0.000	0.116
N	9,368	8,668	9,368	9,368	9,368	9,311

Mean	185,487	16.91	641,057	458,201	458,201	1,161,567
<b><i>Panel B. Female-led recipient firms</i></b>						
Pre-pgm diff	12,438	0.064	47,134	-1,064	19,797	1,963
P-value	0.350	0.143	0.205	0.975	0.689	0.888
Pgm effect	38,955	0.055	102,019	22,982	138,695	27,243
P-value	0.019	0.229	0.005	0.458	0.025	0.026
N	4,125	3,824	4,125	4,125	4,125	4,102
Mean	176,230	17.12	647,999	428,510	1,225,427	73,457
<b><i>Panel C. Male-led recipient firms</i></b>						
Pre-pgm diff	-38,617	-0.018	-86,065	-172,056	-61,718	-8,657
P-value	0.074	0.688	0.071	0.004	0.308	0.562
Pgm effect	55,915	0.131	126,083	-21,662	328,644	1,511
P-value	0.010	0.012	0.011	0.727	0.000	0.906
N	5,238	4,839	5,238	5,238	5,238	5,204
Mean	193,488	16.70	632,570	479,245	1,106,210	64,007

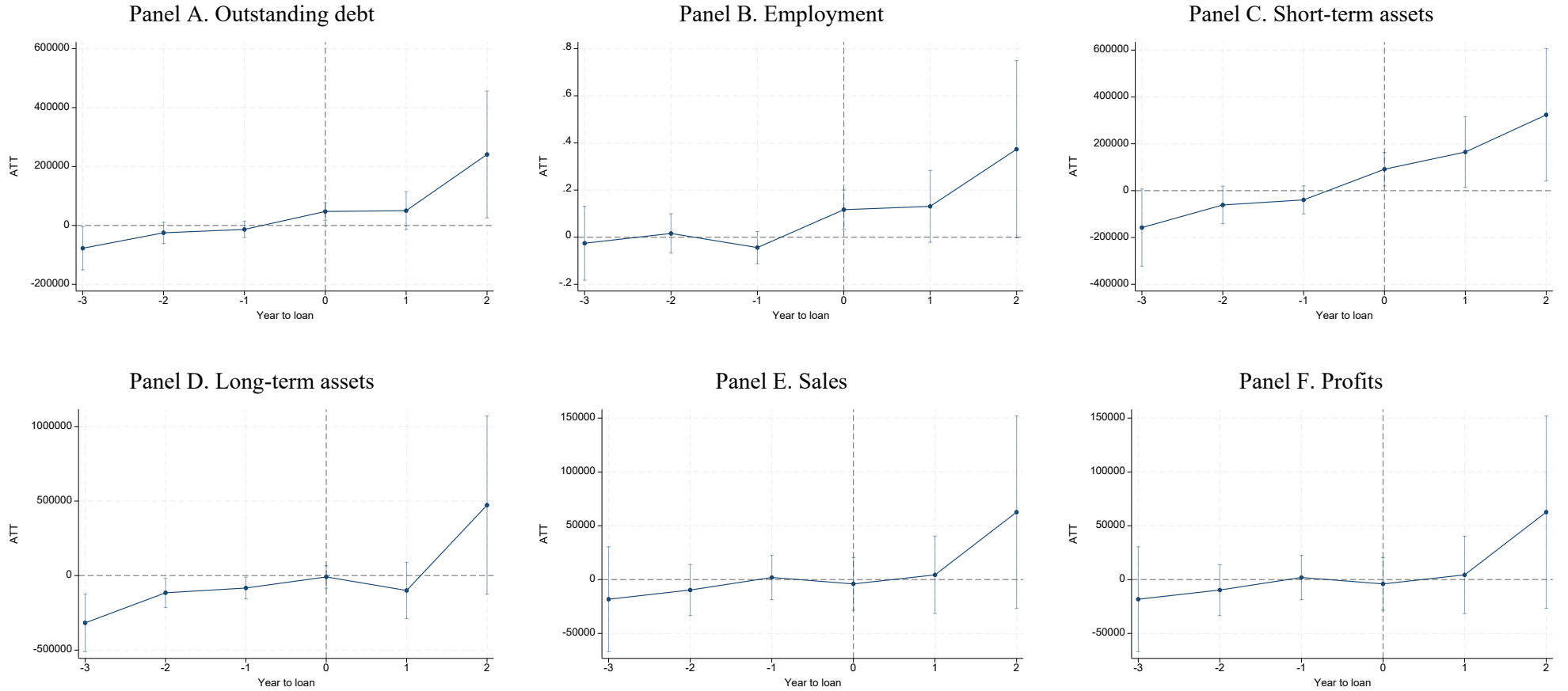
Notes: The table reports the chi-squared statistics and p-values of tests evaluating if the pre-loan program effects are equal to zero, as well as the impact estimates of the loan program and corresponding p-values and number of observations. The outcomes are listed in columns 1 to 6. The estimates are calculated for all firms participating in the program (Panel A) as well as female-led firms (Panel B) and male-led firms (Panel C) that participated in the program. All estimates are calculated using the *csdid* command in Stata (Callaway and Sant'Anna (2021)), clustering the standard errors at the firm level.

**Figure 3. Impact of program loan for female-led firms**



Notes: The figure plots the Callaway and Sant’Anna estimates of the yearly pre and post-loan program effects on our six outcomes of interest for the sample of female-led firms. The plots are generated using the *event\_plot* command in Stata, clustering the standard errors at the firm level. The vertical lines correspond to the 95% confidence intervals.

**Figure 4. Impact of program loan for male-led firms**



Notes: The figure plots the Callaway and Sant’Anna estimates of the yearly pre and post-loan program effects on our six outcomes of interest for the sample of male-led firms. The plots are generated using the *event\_plot* command in Stata, clustering the standard errors at the firm level. The vertical lines correspond to the 95% confidence intervals.

In Panel A of Table 6, we examine the effects of the program on firms that had no prior loans with financial institutions. We expect these firms to experience greater benefits, as they are more likely to gain from relaxed credit constraints. Consistent with our prior, because of the program, these firms increased employment from 9 to 11.5 workers (i.e., 27 percent increase), expanded their short- and long-term assets by 86 and 142 percent, respectively, and raised their sales by 97 percent. We further examine the program's effects separately for firms without prior loans that are led by women (Panel B) and men (Panel C). While the smaller sample sizes reduce precision, the program's effects remain of similar magnitude and statistically significant for most outcomes, particularly among female-led firms.

**Table 6. Impact of the loan program on recipient firms without prior loans**

	(1) Outstanding debt	(2) Employment	(3) Short-term assets	(4) Long-term assets	(5) Sales	(6) Profits
<b><i>Panel A. All recipient firms</i></b>						
Pre-pgm diff	0	0.039	82,699	45,040	29,025	6,641
P-value	.	0.624	0.021	0.178	0.643	0.647
Pgm effect	133,365	0.274	154,832	240,779	413,266	21,621
P-value	0.000	0.000	0.013	0.036	0.016	0.257
N	1,365	1,273	1,365	1,365	1,365	1,358
Mean	0	8.99	178,153	169,097	425,697	26,183
<b><i>Panel B. Female-led recipient firms</i></b>						
Pre-pgm diff	0	0.103	19,869	69,095	39,824	13,016
P-value	.	0.405	0.395	0.197	0.576	0.593
Pgm effect	145,351	0.341	178,872	312,175	165,996	27,257
P-value	0.003	0.001	0.010	0.060	0.213	0.338
N	524	490	524	524	524	520
Mean	0	8.50	151,166	163,198	405,277	26,927
<b><i>Panel C. Male-led recipient firms</i></b>						
Pre-pgm diff	0	0.030	78,467	-15,041	-54,985	724
P-value	.	0.786	0.033	0.485	0.537	0.968
Pgm effect	129,683	0.292	100,943	138,823	583,263	15,304

P-value	0.000	0.013	0.373	0.392	0.019	0.572
N	836	778	836	836	836	833
Mean	0	9.06	175,594	145,443	421,699	24,745

Notes: The table reports the chi-squared statistics and p-values of tests evaluating if the pre-loan program effects are equal to zero, as well as the impact estimates of the loan program and corresponding p-values and number of observations. The outcomes are listed in columns 1 to 6. The estimates are calculated for firms without credit prior to participating in the program (Panel A) as well as for female-led firms (Panel B) and male-led firms (Panel C) without credit prior to participating in the program. All estimates are calculated using the *csdid* command in Stata (Callaway and Sant’Anna (2021)), clustering the standard errors at the firm level.

Since the program facilitates credit access, its impact is likely to be smaller for firms with prior loans, as these firms may not have been credit constrained to begin with. In an additional test, we analyze the program’s impact on the sample of firms with outstanding loans from financial institutions prior to the program. We summarize the results in Panel A of Table 7. Our first finding is that the program had no impact on the outstanding debt of firms with prior credit access (Column 1). One reason may be that these firms used the program loan to replace other sources of financing rather than increasing their overall debt levels. This aligns with a strategy used by firms to shift to lenders offering better terms (e.g., lower interest rates, longer maturities, or less stringent conditions). Consistent with firms substituting lenders rather than expanding their operations, the program has no impact on employment (Column 2). However, after obtaining a loan from the program, firms with prior credit access reduced their long-term asset holdings, leaving their short-term assets unchanged (Columns 3 and 4). We find weak evidence that the program enables firms to expand their sales (Column 5), with no significant change to their profitability (Column 6). However, the effect on sales is only statistically significant at the 90-percent level.

**Table 7. Impact of the loan program on recipient firms with prior loans**

	(1) Outstanding debt	(2) Employment	(3) Short- term assets	(4) Long-term assets	(5) Sales	(6) Profits
<b>Panel A. All recipient firms</b>						
Pre-pgm diff	-12,603	0.011	-28,637	-97,136	-27,682	-3,775

P-value	0.353	0.724	0.355	0.009	0.498	0.732
Pgm effect	4,474	-0.019	34,978	-86,409	102,972	6,433
P-value	0.760	0.582	0.251	0.010	0.060	0.499
N	7,989	7,382	7,989	7,989	7,989	7,939
Mean	215,985	18.23	717,168	505,735	1,282,558	75,310

**Panel B. Recipient firms with debt-to-assets above the median**

Pre-pgm diff	-42,178	-0.044	-26,147	-96,741	-111,679	5,283
P-value	0.075	0.320	0.421	0.013	0.048	0.760
Pgm effect	-13,582	-0.008	64,042	-103,965	139,537	-4,737
P-value	0.536	0.865	0.083	0.020	0.047	0.722
N	3,999	3,660	3,999	3,999	3,999	3,971
Mean	355,873	19.07	750,611	537,657	1,366,848	81,754

**Panel C. Recipient firms with debt-to-assets below the median**

Pre-pgm diff	9,025	0.059	-31,194	-96,486	45,958	-11,818
P-value	0.499	0.202	0.545	0.121	0.426	0.396
Pgm effect	19,741	-0.040	9,271	-69,278	64,776	16,950
P-value	0.307	0.431	0.847	0.171	0.442	0.214
N	3,990	3,722	3,990	3,990	3,990	3,968
Mean	81,599	17.45	685,040	475,069	1,201,584	69,134

Notes: The table reports the chi-squared statistics and p-values of tests evaluating if the pre-loan program effects are equal to zero, as well as the impact estimates of the loan program and corresponding p-values and number of observations. The outcomes are listed in columns 1 to 6. The estimates are calculated for firms with outstanding credit prior to participating in the program (Panel A) as well as for female-led firms (Panel B) and male-led firms (Panel C) with outstanding credit prior to participating in the program. All estimates are calculated using the *csdid* command in Stata (Callaway and Sant'Anna (2021)), clustering the standard errors at the firm level

To explain these puzzling results, we further split the sample of firms with prior loans into two groups: more indebted firms (i.e., firms that prior to the program had an outstanding debt to asset ratio above the median), and less indebted firms (i.e., firms with below median outstanding debt to assets ratio prior to the program). We display the results for more and less indebted firms in Panels B and C of Table 7. For both groups of firms, outstanding debt remains unchanged after the loan program, suggesting that firms with prior credit likely benefit from the program by substituting financing sources rather than by growing. The estimates in Panel B show that more

leveraged firms increase short-term assets by 8.5 percent while reducing long-term assets by 19 percent, although the effect on short-term assets is only statistically significant at the 90-percent level. One potential interpretation is that ex-ante more indebted firms use the program loan to prioritize liquidity over investment (e.g., by holding more cash, increasing inventories, or paying off urgent obligations). The reduction in total assets, which is driven by firms selling off long-term assets, may indicate that more leveraged firms seek to deleverage and reduce financial risk (e.g., selling equipment and leasing instead). As a result of the program, these firms increase their sales by 10 percent, suggesting that the program loan enabled them to stabilize operations rather than expand their businesses. The strategy of adjusting asset composition and prioritizing liquidity is exclusive to more leveraged firms. As Panel C shows, low-leverage firms with prior credit access do not exhibit these changes, likely because they were not financially constrained and did not face the same pressure to rebalance their finances or improve liquidity.

## **7. Conclusions**

This paper assesses the impact of a second-tier credit line under a World Bank project with Ecuador's development bank CFN. The program, implemented by CFN in partnership with 22 financial institutions, aims to increase financing for MSMEs. Our results show that the program effectively expanded access to credit, leading to significant firm growth. Specifically, the program increased employment (an average increase of 1.5 workers per firm) and short-term assets (by 17 percent), leading to a 53 percent increase in firm sales. Notably, the program's impact grew over time, suggesting that the initial boost from financing was amplified as firms used the capital to expand their operations and invest in working capital.

The positive effects were mostly driven by firms with no prior credit access, highlighting the program's potential to relax credit constraints for underserved firms. For firms with prior access to credit, the program did not expand their overall outstanding debt. Instead, these firms were able to substitute potentially more expensive financing sources. Firms with prior access did not increase employment due to the program and saw a smaller increase in sales compared to firms without prior access. However, firms without prior access were significantly less likely to receive loans through the program.

Our results highlight the challenges that public authorities encounter when targeting interventions in the financial sector, especially when financial institutions select the program beneficiaries. CFN has successfully transformed into a second-tier bank with a robust business model and strong balance sheet, contributing to the stability of the Ecuadorian financial system. At the same time, reaching many firms requires collaboration with financial institutions, whose incentives can constrain credit from being allocated to those with more limited access to financing. The participating financial institutions tended to prioritize larger companies with fewer credit constraints, probably perceiving them as higher-quality clients. This underscores a prevalent challenge in financial sector programs worldwide that rely on market participants to enhance credit access for vulnerable populations.

In conclusion, the second-tier credit program succeeded in stimulating the growth of financially constrained companies. Since the effects increase over time, they may grow even further in the future. The findings also underscore the importance of considering both targeting mechanisms and financial institution incentives when designing financial sector interventions. Ensuring that these programs effectively reach excluded populations will be key to maximizing their impact on business growth and economic development.

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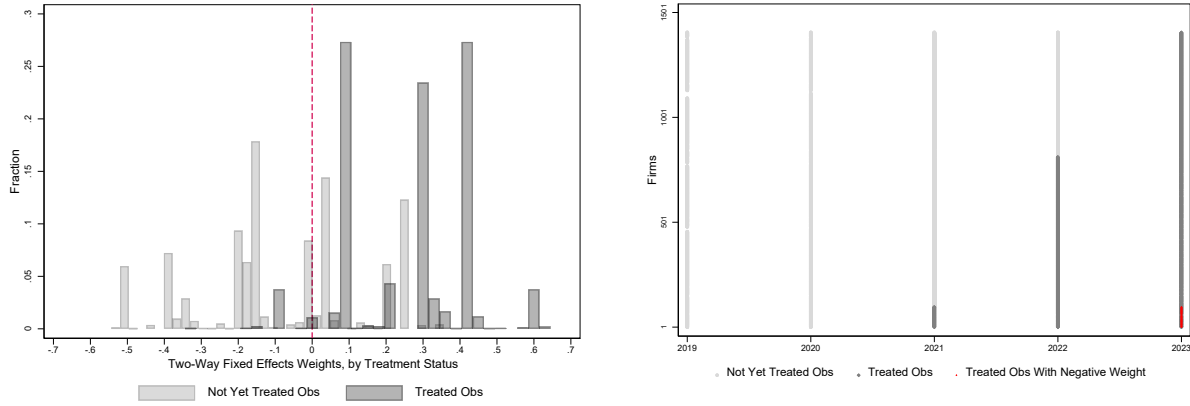
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# Appendix

Appendix Figure A1: Distribution of Two-Way Fixed Effects Weights



Notes: Panel A plots the distribution of TWFE weights for not-yet-treated and treated firms. Panel B plots the distribution of negative TWFE weights by firm and year. Weights are calculated as the inverse of the residuals from a regression of the treatment variable on firm and year fixed effects.