

# Better Loans or Better Borrowers?

Impact of Meso-Credit on Female-Owned Enterprises  
in Ethiopia

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## Abstract

This paper explores the impact of large, individual-liability loans on the growth of women-owned microenterprises in Ethiopia. Traditionally, microfinance institutions in Ethiopia have primarily catered to female enterprises with group lending schemes that provide very small loans. The limitations of this model are two-fold: in addition to these micro-loans being too small in size to fuel meaningful business growth, many of the female enterprises that are targeted with these loans face binding constraints, such as concentration in lower-growth sectors, lack of alternative job opportunities, limitations on time and mobility, and restrictive gender norms. The paper investigates the impact of credit to female entrepreneurs in a novel context, by examining larger loans, provided to growth-oriented

women entrepreneurs. These entrepreneurs fall in the “missing middle” or “meso-finance” segment of the financial market because their credit needs are too large for microfinance, but not large enough for commercial banks. The paper uses a propensity score matching methodology to examine the impact of loans offered to women as part of the Women Entrepreneurship Development Project, a program funded by the World Bank International Development Association, that targets growth-oriented women entrepreneurs in Ethiopia. The results suggest that large, individual-liability loans can make a significant difference in accelerating growth in the business incomes and employment levels of women-owned enterprises.

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## **Better Loans or Better Borrowers? Impact of Meso-Credit on Female-Owned Enterprises in Ethiopia**

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## I. Introduction

Support for micro- and small-enterprises is a popular policy option for governments all over the world. In Ethiopia, specifically, increasing efficiency and competitiveness of micro and small-scale enterprises is a focus of the Growth and Transformation Plan II (2015-2019). A common pillar of support to microenterprises has been to facilitate access to credit, often in the form of microfinance. Over time, microfinance has increasingly been utilized as a tool to support female entrepreneurs. Recent reports show in Sub-Saharan Africa among micro- and small-firms there is no longer a gender gap in terms of access to microfinance (Demirguc-Kunt et al. 2014). Aterido et al. (2011) find no evidence that women are disadvantaged in terms of access to capital when controlling for firm and entrepreneur characteristics and argue that this is due to “female favoritism” in the microfinance industry in offering loans to micro and small firms.

While the availability of microfinance has undoubtedly expanded, the question of whether microfinance can help enterprises to grow and ultimately alleviate poverty is under intense scrutiny. A recent review of six randomized evaluations across four continents suggests that, while microcredit has some benefits, it has not led to the transformative improvements in business performance and poverty reduction widely expected (Banerjee et al 2015). Many of the microfinance randomized controlled trial (RCT) studies in the last decade have left people with a common perception that, while microfinance has helped many firms to smooth incomes and has introduced many entrepreneurs to financial services for the first time, it has not been able to propel the majority of firms onto a growth trajectory (Tarozzi et al. 2015).

The existing microfinance studies also paint a broad view that female-operated enterprises benefit from microfinance even less than men. The explanations for this differential impact between women and men focus on the gender-specific constraints that may prevent women from benefiting from the influx of capital, such as the concentration of women entrepreneurs in lower-growth sectors; time and social constraints, including pressures from self or others to spend; and the fact that many women micro-loan clients are ‘necessity’ entrepreneurs that would likely opt for wage employment if it was available (Buvinic and O’Donnell, 2016).

Traditionally, microfinance institutions (MFIs) have primarily catered to female micro-firms with group lending schemes that provide very small loans. These micro-loans, usually in the amount of a few hundred dollars, may be insufficient to fuel business investment and growth. In Ethiopia, a “missing middle” phenomenon in credit markets has been well-documented, by which growth-oriented firms are highly capital-constrained, because their credit needs are too large for microfinance, but not large enough for commercial banks. In Ethiopia, microfinance group loans rarely exceed a value USD 1,500, while commercial banks rarely lend in amounts below USD 50,000. The underserved segment of women entrepreneurs seeking loans between approximately USD 1,000 and USD 50,000 constitutes the missing middle. This paper seeks to explore the impact of credit

offered to female entrepreneurs in a novel context, by examining larger loans, provided to growth-oriented women entrepreneurs in the missing middle segment.

This paper uses a Propensity Score Matching (PSM) method to examine the impact of “missing middle” or meso-loans offered to women as part of the Women Entrepreneurship Development Project (WEDP) in Ethiopia. WEDP is a World Bank IDA-funded program that provides loans and entrepreneurship training to growth-oriented women entrepreneurs in Ethiopia. The project helps MFIs upscale to provide larger, individual loans to serve growth-oriented women entrepreneurs. The line of credit of \$45.9m is disbursed to twelve MFIs across six different Ethiopian cities: Addis Ababa, Adama, Bahir Dar, Dire Dawa, Hawassa and Mekelle. The line of credit is disbursed (wholesaled) to them via the Development Bank of Ethiopia (DBE) and the WEDP MFIs are required to have at least 10,000 borrowers, PAR90 below 5%, a specific capital adequacy ratio, and meet a number of other governance, HR, and financial benchmarks.

By nature of its focus on MFI upscaling, the WEDP operation targets a significantly different population of female entrepreneurs than the traditional group lending schemes operated by Ethiopian MFIs. The average WEDP loan size across all issued loans in 2017 was 237,000 Ethiopian Birr (USD 12,000 when exchange rate \$1 = 20 ETB) which is an increase of approximately 800% on pre-WEDP loan sizes. As a comparison, the maximum group-liability loan size available to these enterprises outside of WEDP was approximately USD 1,000-1,500. The majority of WEDP borrowers (61%) were new borrowers, who had not previously accessed loans through a formal financial institution. The loans themselves range in maturity from 24 to 36 months. The WEDP MFIs are frequently developing new loan products and recognizing new forms of collateral such as vehicles, personal guarantees, and even business inventory, to secure loans.

In this paper, we first unpack the selective take-up that was observed by analyzing characteristics of WEDP-registered female firms who were actually able to borrow versus those who were not. The females who received a WEDP loan differed from those who did not receive a loan on a number of characteristics: they are older with higher educational attainment and had larger businesses with greater household asset wealth than the rest of the sample at baseline. The entrepreneurs who get a loan also score better on measures of entrepreneurial identity and locus of control which potentially indicates that the MFIs who received WEDP funds are indeed only approving loans for the entrepreneurs who are demonstrating a higher entrepreneurial capability and therefore pose a lower risk of loan default for the lender. Better knowledge of the characteristics of female firms who borrow is important for offering direction on microfinance program targeting.

Next, we apply a Propensity Score Matching (PSM) method to test impacts of the loan by creating a statistical comparison group of firms among those who did not receive loans that is based on a model of the probability of participating conditional on a set of observable characteristics. Through this analysis, we are

able to isolate and understand the impact of these large loans on the growth of the participating enterprises.

The remainder of this paper is organized as follows. Section II describes our main data source and empirical strategy. Section III reports on the selection that was observed for the WEDP services; section IV analyzes the start-up and survival of firms in the sample and section V outlines the characteristics of firms and their owners who were able to borrow. Section VI presents the results of receiving a loan on firm performance. Section VII concludes.

## II. Data and Empirical Strategy

### A. Data

The data used in this paper come from the Women Entrepreneurship Development Project (WEDP) impact evaluation sample of firms. In order to build a sample for the impact evaluation the research team relied on the registration database of WEDP firms that was being collected by the Federal Micro and Small Enterprise Development Agency (FeMSEDA) from the beginning of 2014. Before a baseline survey could be carried out we had to wait until enough firms were registered for the WEDP program for an appropriate impact evaluation (IE) sample to be established. However, this waiting period meant that by the time of the baseline survey there were some firms that could have already received WEDP loans or training. Since the baseline survey began in October 2014 the research team collected information about whether any WEDP services had been taken-up at the time of baseline and we relied on asking retrospective information about some key variables during the baseline survey to be able to determine pre-program levels.

Between October and December 2014 baseline data were collected from WEDP-registered firms in six Ethiopian cities and formed a sample of 2,369 female entrepreneurs. The WEDP baseline questionnaire contained a set of questions on household demographic characteristics, socioeconomic status, business sales, profits, costs, employees, entrepreneurial profile (e.g., age, place of birth, education level), and questions designed to elicit an entrepreneur's business knowledge and level of financial literacy.

A follow-up survey was conducted between December 2016 and February 2017 for the same firms approximately 2 years after the baseline for 2,139 firms which is 90% of the baseline sample. The attrition rate of firms that were either not found, owner died or refused to be surveyed for the follow-up survey was 10%. The rate of survey attrition was similar across firms that received a loan and those that did not. The survey questionnaire elicited business performance, business practices and further entrepreneurial and psychological characteristics of the female business owners.

### B. Empirical Strategy

#### 1. PROGRESSION OF FIRMS FROM BASELINE TO FOLLOW-UP

For outcomes in which the same question was asked pre-program and post-program, the regression specification will be the following analysis of covariance (ANCOVA) estimator:

$$Y_{it} = \beta_0 + \beta_1 \text{Loan}_{2014i} + \beta_2 \text{Loan}_{2016i} + \beta_3 Y_{2012i} + \lambda \text{Post}_{2016} + X'_{2014i} \beta_4 + \varepsilon_{it} \quad (E1)$$

Where  $Y_{it}$  is the outcome variable measured in 3 time periods: pre-program (2012), in 2014 and in 2016.  $\text{Post}_{2016}$  is a time dummy for the 2016 follow-up round.  $\text{Loan}_{2014i}$  and  $\text{Loan}_{2016i}$  are the treatment dummy variables taking the value of one if the firm reported receiving a WEDP loan in either 2014 and/or 2016.  $\beta_1$  and  $\beta_2$  will measure the treatment effect as compared to the control group that did not receive a loan.  $Y_{2012i}$  is the pre-program value of the outcome variable measured retrospectively for the year 2012.  $X'_{2014i}$  is a vector of baseline control variables such as age and marital status. In cases when a control variable is missing, its value is set to zero and a dummy is included for whether the variable is missing.  $\varepsilon_{it}$  is the error term.

The second specification is the difference-in-difference (DID) estimator:

$$Y_{it} = \beta_0 + \beta_1 \text{Loan}_{2014i} + \beta_2 \text{Loan}_{2016i} + \beta_3 \text{Post}_1 \text{Loan}_{2014i} + \beta_4 \text{Post}_2 \text{Loan}_{2016i} + \beta_5 \text{Post}_1 + \beta_6 \text{Post}_2 + X'_{2014i} \beta_4 + \varepsilon_{it} \quad (E2)$$

Where  $Y_{it}$  is the outcome variable measured pre-program (2012), in 2014 and in 2016.  $\text{Loan}_{2014i}$  and  $\text{Loan}_{2016i}$  are the treatment dummy variables taking the value of one if the firm reported receiving a WEDP loan in either 2014 and/or 2016.  $\text{Post}_1$  and  $\text{Post}_2$  are dummy variables taking the value of one in the two respective follow-up time periods. The interaction terms  $\beta_3$  and  $\beta_4$  will measure the difference-in-difference treatment effect.

The regression specifications in E1 and E2 will allow us to analyze the impact of receiving a loan on performance outcomes versus a control group in both time periods (2014 and 2016) so that we can pinpoint when the impact occurs. In all the regressions we control for whether the firm received any WEDP business training and if the 2013 retrospective estimate was used for the pre-program outcome rather than the 2012 estimate. All variables denominated in Ethiopian Birr are winsorized at the 99th percentile to deal with the possibility of sensitivity of the results to outliers.

Since receiving a loan is a choice rather than randomly assigned, the propensity score matching (PSM) method is used to adjust for any potential selection bias. PSM balances the distributions of observed covariates between a treatment group and a control group based on similarity of their predicted probabilities of receiving a loan (i.e. on their propensity scores). We use the predicted values from a

standard probit model to estimate the propensity score for each observation in the loan (treated) and the no loan (control) group samples. The conditional independence assumption that underlies the validity of the PSM methodology requires that conditional on observable characteristics, receiving a WEDP loan is independent of potential outcomes and unobservable heterogeneity is assumed to play no role in participation (Dehejia and Sadek, 2002). The conditions for our study are relatively promising for propensity score matching to be reliable, since both the loan recipients and the control group were all registered with the WEDP program and are from the same localities so are likely to have similar observable backgrounds. It is possible that the MFI lenders may have access to more information about the borrower than what is included in our survey instrument and unobservable lender information may still influence the estimation results. However, we will use a well-specified probit regression to estimate the probability of receiving a loan, grounded on empirical evidence in the financial and entrepreneurship space.

The PSM method will be used in the DID model such that the control group outcome is matched to a treated observation using characteristics of the entrepreneur (PSM Min) and entrepreneur characteristics plus a measure of firm size (PSM Max). Specifically, the propensity score specification matches on age of business owner, age squared, higher than secondary education, household size, a measure of cognition (digitspan memory recall), an entrepreneurial identity index as a proxy for motivation and passion and number of employees as a proxy for firm size at baseline (variables for gender and marital status are excluded since the sample is all female and the majority are married). The chosen variables were collected in the same baseline survey and are theorized to be important covariates of receiving a WEDP loan with measures of firm size, demographic information and entrepreneurial skill all included. Using the estimated propensity scores, matched-pairs are constructed on the basis of how close the scores are across the two samples where the matching estimator is based on a kernel-weighted average of control outcomes. Prior to matching, the estimated propensity scores for those with and without WEDP loans were respectively 0.3526 (standard error of 0.079) and 0.324 (0.078) and the region of common support was [0.144, 0.606]. Figure 3 in the Appendix displays the distribution of estimated propensity scores for the two groups and the region of common support. In addition, Figure 4 in the Appendix gives details of the probit regression to establish the propensity score and presents the balance test to verify the second identifying assumption for PSM of the presence of a common support.

## 2. LEVEL DIFFERENCES

An OLS regression specification will be used to compare the average differences of those firms that received a WEDP loan to those that did not across a larger variety of outcome measures that were collected in the 2016 follow-up survey round only.

$$Y_i = \beta_0 + \beta_1 \text{Loan}_i + \lambda \text{Post}_{2016} + X'_i \beta_2 + \varepsilon_i \quad (\text{E3})$$

Where:  $Y_i$  is the outcome variable measured in 2016.  $\text{Loan}_i$  is a dummy variable taking the value of one if the firm received a loan at any point as reported in either 2014 or 2016 surveys.  $\text{Post}_{2016}$  is a dummy variable taking the value of zero in 2014 and one in 2016.  $X'_i$  is a vector of control variables that could change from the 2014 to 2016 (for example, age of owner, marital status and household size).  $\beta_1$  will measure the average level differences of firms that receive a WEDP loan versus those that did not. Propensity score matching will again be utilized such that the control group outcome is matched to a treated observation using characteristics of the entrepreneur and firm size (as described above).

Before presenting our impact results, we first describe the observed take-up of the different WEDP programs and present characteristics of firms that were actually able to borrow.

### III. Take-Up of the WEDP Services

Female firm owners register for WEDP in Ethiopia via One Stop Shops in their city and their business is required to be a registered firm for at least six months. The WEDP-registered entrepreneurs are not guaranteed a loan – both the entrepreneurs can choose which program services (loan or training) they want to take-up and the MFIs will determine creditworthiness of the borrower before lending. During the follow-up surveys, we asked the business owner to specify which WEDP program services they utilized. The self-reported WEDP loan and training status were reconciled with administrative data collected by WEDP and information in the access to finance section of the survey. Table 1 shows that at the time of the follow-up survey 34% of firms in the sample received a WEDP loan and 78% took WEDP training that was provided through Technical and Vocational Education and Training (TVET) colleges.

WEDP Program Status	Number of firms	Percentage
Loan Only	164	8%
Training Only	1,118	52%
Both loan and training	551	26%
No WEDP Services	306	14%
Total	2,139	100%

TABLE 1—NUMBER OF FIRMS THAT RECEIVED THE DIFFERENT WEDP SERVICES

These proportions are in line with administrative data of overall WEDP-registered clients that stand at 19,431 firms in 2017. We find 35% received a WEDP loan and 54% received training in the full database of registered WEDP firms.

The MFIs started distributing WEDP loans beginning in January 2014 and at the time of the baseline survey that began in October 2014, 23% of the sample of 2,369 firms had already received a WEDP loan and 54% of the sample had received the WEDP training. Therefore, to establish pre-program levels for the impact analysis we utilize the retrospective questions asked during the baseline to be able to analyze the growth of the firms that received a WEDP loan as compared to those that did not. As a robustness check for our impact results we also compare the average difference in post-program outcome levels of those that reported having received a WEDP loan in either survey round to a matched comparison group of firms that did not receive loans in any period.

#### IV. Firm Start-Up and Survival

In the baseline sample of firms, 21% reported starting their business operation in the year of the survey (2014). We regard these firms as “start-up” businesses and consider the possibility that receipt of a WEDP loan may have impacted whether the firm started operations. We find that firms that received a loan in the year 2014 (as reported in the baseline survey) were 8% more likely to have started a business in the year 2014 than the rest of the sample.

Additionally, during the follow-up survey we also established if the original sample of WEDP registered clients were still running a business and found 79% with operational businesses (5% had changed business sector).

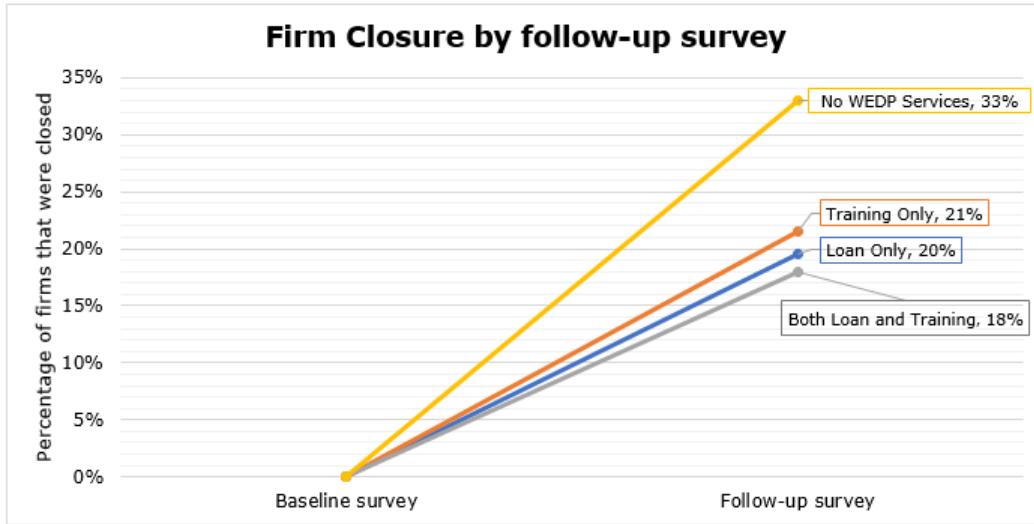


FIGURE 1. FIRM CLOSURE BY THE FOLLOW-UP SURVEY

Figure 1 presents, by WEDP status, the percentage of firms that had closed by the time of the follow-up survey. The likelihood that the entrepreneur closed

their business by the follow-up survey was lower if they received any WEDP service (loan or training). We cannot be sure on the direction of causality— those firms that did not utilize WEDP services could be more likely to close or they closed and therefore had less time to take up the services offered by the program. Perhaps if you are on the cusp of bankruptcy then you may be more likely to be rejected for a loan or if you are busy shutting down a failing business you have no time to take up the WEDP services?

Of the 452 businesses that were closed by the time of the follow-up survey the most common reasons for shutting down operations was that they could not get a loan (29%) and prohibitive rent costs or insufficient infrastructure to continue with business operations. A comparison of baseline outcomes of open and closed businesses suggested that the businesses that shutdown were smaller and their owners were younger with lower measures of non-cognitive skills than those that continued operating a business.

The results in this paper will assess impact of receiving loans for existing firms at baseline and start-up firms separately. To account for the impact of receiving a loan on survival, in the analysis we will provide both unconditional estimates (which code outcomes as zero for individuals not operating the business at follow-up) and conditional estimates (which requires the firm to be in operation at follow-up to be included in the analysis). A comparison of these results will help us understand whether any effects of receiving a loan on firm performance is driven by the impact on business survival.

## V. Who Borrows?

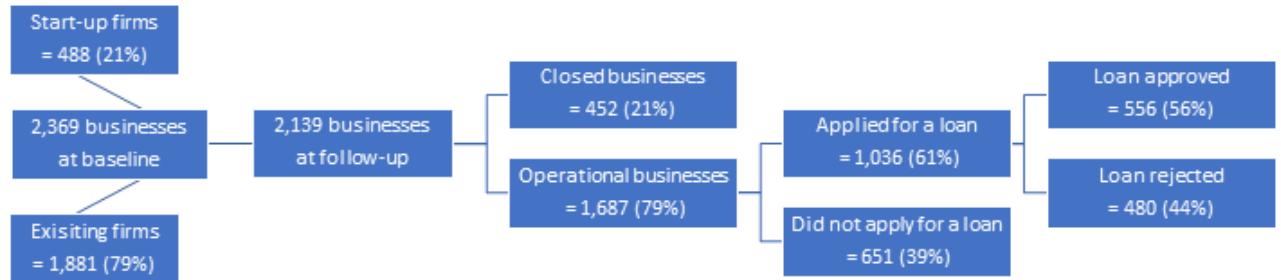


FIGURE 2. SAMPLE SIZE OF SURVEYS, LOAN APPLICATIONS AND APPROVALS

Figure 2 shows that among the sample of 1,687 operational businesses at the time of follow-up, not all firms applied for a WEDP loan – we find that 61% of firms reported applying for a WEDP loan. The main reasons for borrowing were to purchase equipment (56%) and inputs (27%). Of those firms that applied for a loan 56% reported that they were approved for an MFI loan and 44% were

rejected. The main reason given for loan rejection or not applying was that the firm owner could not provide the collateral needed for the loan. A house was the most common collateral provided for an approved WEDP loan which was solely owned by the female owner in only 35% of the cases. The average WEDP loan size among the firms that were approved a loan was approximately USD 12,000. Approximately, half of the “training only” and “no WEDP services” groups did not apply for a loan and the other half applied for a WEDP loan but were not approved.

In Tables 2 and 3 we compare the baseline outcomes for WEDP borrowers and non-borrowers for the 2,139 firms (1,700 existing firms and 429 start-ups at baseline) that were resurveyed during the 2016 follow-up survey.

Table 2 column (4) shows the existing female business owners that received a WEDP loan differed from those that did not receive a loan on a number of characteristics: they are older with higher educational attainment and had larger businesses with greater household asset wealth than the rest of the sample at baseline. The entrepreneurs that get a loan also score better on measures of entrepreneurial identity and locus of control which potentially indicates that the MFIs are only approving loans for the entrepreneurs who are exhibiting higher entrepreneurial capability and therefore could pose a lower risk of loan default for the lender. The lower sample size in column (5) for loan applicants is because the WEDP loan information was only collected for firms that were still operational during the follow-up survey. Among the 60% of firms that applied for a WEDP loan we find that they are, on average, larger firms and their owners score higher on non-cognitive skill measures than those that did not apply. The WEDP loan application process itself could potentially encourage this selection if the application process is considered cumbersome then some women could be discouraged if, say, a lot of documentation is needed. Those who present with higher non-cognitive skills may be those who have the resolve to persevere through the application. In addition, since those receiving a loan report a significantly higher household asset index at baseline perhaps these women are those that are able to come up with the collateral to meet the terms of a loan set by the MFI. Restricting the sample further, column (6) shows that the WEDP loans are being approved among older, more highly educated firm owners that exhibit higher entrepreneurial identity and locus of control skill measures.

Table 3 compares WEDP borrowers and non-borrowers among the start-up firms i.e. those that opened their business in the year 2014. In column (4) we find that the women that received a loan were older and had higher household wealth at baseline as proxied by a household asset index. The women that applied for a loan for a “start-up” business have higher education and score higher on measures on self-efficacy than those that did not. The positive significant age difference between women that were approved for a loan and were rejected could potentially indicate that lenders are more willing to lend to finance start-up firms when the entrepreneur has demonstrated sufficient prior working experience.

## VI. Results

To account for the possible impact of receiving a loan on firm survival, we code firms that are closed as having zero employment and zero profits in our analysis. This enables us to examine the full unconditional impact on these outcomes in a way which is not subject to selectivity concerns present in comparing only firms in operation. We also provide comparisons of treatment and control profits and sales conditional on start-up and survival. The comparison group for the impact analysis is drawn from the firms that received no WEDP loans as measured at time of follow-up.

### *A. PROGRESSION OF EXISTING FIRMS FROM BASELINE TO FOLLOW-UP*

In tables 4 to 7 we report results for five models: ANCOVA, ANCOVA with controls, difference-in-difference with controls (DID with controls), DID with propensity score matching using entrepreneur characteristics (DID PSM Min Kernel) and DID with propensity score matching using entrepreneur characteristics plus firm size proxied by number of employees at baseline (DID PSM Max Kernel).

Tables 4 to 7 present the impact of receiving a loan on average yearly profit, number of employees, hours worked by the owner and hours worked by employees for firms that were in operation at baseline. These are the outcomes for which we have the pre-program estimates based on retrospective recall. Columns (4) and (5) present the DID estimates using propensity score kernel matching that matches a comparison group based on a number of covariates that predict the likelihood of receiving a loan. The included outcomes used to construct the propensity score are: age of the owner, age squared, education, household size, digitspan score (memory recall), entrepreneurial identity index and number of employees at baseline.

Table 4 reports the results for the average treatment effect of receiving a loan on average yearly profits by comparing WEDP borrowers to non-borrowers. Impacts in the 2014 and 2016 survey rounds are presented in the table. Receiving a WEDP loan has a positive significant impact on the profitability of firms when measured 3 years after the WEDP program started issuing loans (see positive significant coefficient on Loan\_2016 in the ANCOVA regressions in columns (1) and (2)). The magnitude of treatment effects is similar across the DID regression models; however, the PSM model using kernel matching produces a more conservative estimate that is no longer statistically significant (positive coefficient on Loan\_2016\*Post2 shows the treatment impact in 2016). The similar effects for the unconditional and conditional samples suggests that the impact of loans on profitability is not occurring through the extensive margin of allowing firms to survive and earn profits.

Table 5 reports the average treatment effect of receiving a loan on employment. Receiving a loan has a positive impact on the number of employees when measured 3 years after the WEDP program started issuing loans (positive significant

coefficient on Loan\_2016 in the ANCOVA regressions in columns (1) and (2)). The magnitude of treatment effects in the DID models is slightly larger than the ANCOVA and remain statistically significant even when applying PSM methods. Again, the similar effects for the unconditional and conditional samples suggests that the impact of loans on employment is not being driven by the impact on business survival.

Table 6 and Table 7 report the impact of receiving a WEDP loan on the number of hours worked by the owner and by employees. The loans had a small and insignificant impact on the number of hours worked by the owner but a strongly significant positive impact on the number of hours worked by employees per week when measured 3 years after the program started. The magnitude of effects on the number of hours worked by employees is similar across all the regression models.

Overall, the results show that female-owned enterprises who are able to borrow through the WEDP program are able to exhibit a higher growth potential after 3 years than the non-borrowers. The most robust impacts of the loans are on employment generation; however, the impact on profitability is less reliable with the positive impact only significant for the models where matching methods were not utilized. A comparison of the unconditional and conditional results suggests that the impact of receiving a WEDP loan is not occurring through the extensive margin of allowing firms to continue to operate that otherwise would have had to close down.

#### *B. LEVEL DIFFERENCES FOR EXISTING AND START-UP FIRMS*

Next, we report the level differences for firms that received a loan and did not across a wider array of outcomes measured in the 2016 follow-up survey. Tables 8 and 9 report the level differences for those that received a loan to those that did not (the treatment dummy is whether they reported receiving a loan in either the 2014 or 2016 surveys). We report results across three models: ordinary least squares (OLS), OLS with controls and a PSM kernel estimator where the ATT is computed averaging over the unit-level treatment effects of the treated where the control unit outcome matched to a treated observation is obtained as kernel-weighted average of control unit outcomes. PSM Min computes the propensity score based on characteristics of the entrepreneur and PSM Max on characteristics of the entrepreneur plus a measure of firm size.

Table 8 reports the results comparing WEDP borrowers to those without any WEDP loans for firms that were already existing at baseline. In panel A, we report positive significant differences across a range of business performance outcomes (profits, sales, capital machinery and employees are all significantly higher for firms that received a WEDP loan). The PSM kernel matching models in columns (3) and (4) produces similar effects to the OLS regressions and the impacts remain statistically significant. The number of hours worked by the owner is slightly lower for firms that received a loan which is consistent with them passing some of the workload onto their employees since the owner, on average, already works long

weekly hours. In panel B, we compare a range of business practices outcomes and find those firms that borrow are more likely to report maintaining written records and have a formalized plan for their business. We can not rule out that the improvements in record keeping and financial planning may simply reflect the documentation requirements that are needed to apply for a loan through the MFIs or potentially the receipt of a loan may require the firm to be more organized with written records in order to keep track of interest repayments. We find limited evidence of improvements in marketing practices among existing firms that received a loan.

Table 9 reports the results comparing WEDP borrowers to those without any WEDP loans for firms that started their business in 2014 that we are classifying as a “start-up firm”. We find a positive statistically significant difference in average monthly profits for the firms that received a WEDP loan. However, for all other measures of profits, sales and number of employees we do not find statistically significant differences. The PSM kernel matching model in columns (3) and (4) produces effects that are similar in magnitude to the OLS regressions and are still not significant. The lack of evidence of differences in business performance among the start-up firms that borrowed and did not borrow could reflect that these start-up firms have not had enough time to reap the returns of their loan investment and grow their business beyond the non-borrowers. The significantly higher level of capital machinery reported by those that received a loan suggests the WEDP loan was invested directly into the start-up capital for the firm while the non-borrowers possibly used their own savings to start their business in less capital-intensive sectors. Among business practices, the start-up firms that receive a loan similarly improve their record-keeping practices as compared to non-borrowers. In addition, those that received a loan were more likely to self-report that they generated a higher number of business ideas among the newly started firms. Perhaps the receipt of the loan inspired them to be more creative and come up with new ideas since they now have the means to realize their ideas.

## VII. Conclusion

The recent microfinance impact studies that assert only modest effects on business growth for women-owned businesses typically focus on the customary practice of offering small loans to females microentrepreneurs through group lending schemes. These studies tend to leave the reader with the view that women are unable to effectively invest entrepreneurial finance. However, this narrow focus shrouds that loan products as well as borrowers can come in all shapes and sizes. As Cull and Morduch (2017) write ”getting the right product to the right population can yield substantial impacts”. The evidence in this paper shows that larger, individual-liability loans offered to growth-oriented women entrepreneurs in Ethiopia had a significant impact on accelerating their business growth and boosting employment levels. The impact on the average number of employees is particularly pertinent when thinking how these business impacts may be filtered

down to the poorer segments of the market. The WEDP project in Ethiopia was selective in lending to entrepreneurs that were able to demonstrate more entrepreneurial capability and therefore potentially exhibited a lower risk of default for the lender, suggesting due diligence and vetting processes were effective. Perhaps policy and research efforts should be directed to re-thinking loan products to target underserved market segments, with larger and better-fit credit.

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TABLE 2—BASELINE DIFFERENCES FOR EXISTING FIRMS

Table 2: EXISTING FIRMS: Differences between WEDP borrowers and non-borrowers

	All Existing firms at baseline	Loan received	No Loan received	Diff Loan received - No Loan received	Diff Loan Applied - Not Applied	Diff Loan Approved - Not Approved
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A: Differences</b>						
Age of business owner (Number)	34.47 (8.32)	35.72 (8.45)	34.14 (8.22)	1.58*** (0.43)	-0.57 (0.45)	1.86*** (0.56)
Married (1=Yes, 0=No)	0.62 (0.48)	0.66 (0.47)	0.62 (0.49)	0.04 (0.02)	0.02 (0.03)	0.03 (0.03)
Average Yearly Profits pre-program (ETB)	45743.60 (74585.66)	50559.15 (73779.72)	41899.14 (71607.66)	8660.01** (3858.33)	8292.63** (4032.48)	3229.44 (5331.25)
Log of yearly profits pre-program	9.17 (3.04)	9.30 (3.16)	9.06 (3.02)	0.24 (0.16)	-0.02 (0.17)	0.10 (0.23)
Number of workers (Number)	1.74 (3.34)	2.16 (3.41)	1.52 (3.24)	0.64*** (0.17)	0.57*** (0.18)	0.54** (0.25)
Number of hours worked by the owner per week	66.40 (24.41)	65.24 (25.89)	67.29 (24.04)	-2.05 (1.28)	1.79 (1.34)	-6.15*** (1.75)
Number of hours worked by employees	103.22 (206.86)	125.59 (208.49)	91.67 (199.78)	33.91*** (10.49)	34.65*** (11.26)	30.44* (15.52)
Capital at business start (ETB)	43532.59 (90031.50)	53130.49 (99668.33)	38442.00 (84090.01)	14688.49*** (5070.11)	11612.80** (4934.57)	10139.35 (6603.22)
Less than primary education (1=Yes, 0=No)	0.05 (0.21)	0.06 (0.23)	0.04 (0.21)	0.01 (0.01)	-0.00 (0.01)	-0.01 (0.01)
Primary school is max education (1=Yes, 0=No)	0.17 (0.37)	0.17 (0.38)	0.17 (0.37)	0.01 (0.02)	-0.01 (0.02)	-0.00 (0.03)
Secondary school is max education (1=Yes, 0=No)	0.42 (0.49)	0.36 (0.48)	0.44 (0.50)	-0.07*** (0.03)	-0.02 (0.03)	-0.06* (0.03)
Completed more than secondary (1=Yes, 0=No)	0.37 (0.48)	0.40 (0.49)	0.35 (0.48)	0.06** (0.02)	0.04 (0.03)	0.06* (0.03)
Household Asset Index (0-8)	6.02 (1.29)	6.36 (1.21)	5.83 (1.28)	0.52*** (0.06)	0.30*** (0.07)	0.53*** (0.08)
Preference for business (1=Yes, 0=No)	0.36 (0.48)	0.37 (0.48)	0.35 (0.48)	0.02 (0.02)	-0.01 (0.03)	0.02 (0.03)
Digitspan forward recall (0-7)	2.21 (1.10)	2.31 (1.16)	2.15 (1.06)	0.16*** (0.06)	0.21*** (0.06)	0.11 (0.08)
Personal Initiative (0-1)	0.83 (0.14)	0.84 (0.14)	0.82 (0.14)	0.02*** (0.01)	0.03*** (0.01)	0.01 (0.01)
Entrepreneurial Identity (0-1)	0.78 (0.21)	0.80 (0.20)	0.77 (0.21)	0.03*** (0.01)	0.02* (0.01)	0.04*** (0.01)
Entrepreneurial Locus of Control (0-1)	0.75 (0.17)	0.77 (0.18)	0.75 (0.17)	0.02*** (0.01)	0.00 (0.01)	0.04*** (0.01)
Self Efficacy (0-1)	0.79 (0.14)	0.81 (0.14)	0.78 (0.14)	0.03*** (0.01)	0.03*** (0.01)	0.01 (0.01)
Number of Observations	1,700	561	1139	1,700	1,396	838

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

(1) Columns (1), (2) and (3) report means with standard deviations in parentheses.

(2) Column (4) reports the test of differences of means across columns (2) and (3). Columns (5) and (6) report the differences for loan applied/not applied and loan approved/rejected groups respectively.

(3) The majority of outcomes in Table 2 are captured during the baseline survey. The exception to this are the entrepreneurial characteristics (personal initiative, entrepreneurial identity, locus of control and self efficacy) and capital stock at business start that were asked at follow-up. Capital stock at business start was asked retrospectively to firms who were still operational during the follow-up survey.

TABLE 3—BASELINE DIFFERENCES FOR START-UP FIRMS

Table 3: START-UP FIRMS: Differences between WEDP borrowers and non-borrowers

	All Start-up firms at baseline	Loan received	No Loan received	Diff Loan received - No Loan received	Diff Loan Applied - Not Applied	Diff Loan Approved - Not Approved
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A: Differences</b>						
Age of business owner (Number)	31.51 (7.52)	33.18 (7.88)	30.91 (7.18)	2.28*** (0.74)	-0.43 (0.93)	3.48*** (1.04)
Married (1=Yes, 0=No)	0.62 (0.49)	0.68 (0.47)	0.60 (0.49)	0.08 (0.05)	0.05 (0.06)	0.09 (0.07)
Capital at business start (ETB)	68143.14 (123642.41)	95365.74 (150109.03)	51989.07 (101902.93)	43376.68*** (14825.57)	20197.62 (15537.25)	23080.86 (17909.54)
Less than primary education (1=Yes, 0=No)	0.02 (0.14)	0.03 (0.18)	0.02 (0.13)	0.01 (0.01)	-0.03* (0.02)	0.02 (0.01)
Primary school is max education (1=Yes, 0=No)	0.15 (0.36)	0.10 (0.31)	0.19 (0.39)	-0.08** (0.04)	-0.07 (0.05)	-0.04 (0.05)
Secondary school is max education (1=Yes, 0=No)	0.38 (0.49)	0.37 (0.48)	0.36 (0.48)	0.01 (0.05)	-0.00 (0.06)	-0.01 (0.07)
Completed more than secondary (1=Yes, 0=No)	0.45 (0.50)	0.49 (0.50)	0.43 (0.50)	0.06 (0.05)	0.11* (0.06)	0.03 (0.07)
Household Asset Index (0-8)	5.83 (1.35)	6.23 (1.28)	5.63 (1.31)	0.60*** (0.13)	0.31* (0.16)	0.65*** (0.18)
Preference for business (1=Yes, 0=No)	0.30 (0.46)	0.27 (0.45)	0.31 (0.46)	-0.04 (0.05)	-0.05 (0.06)	-0.08 (0.07)
Digitspan forward recall (0-7)	2.34 (1.16)	2.40 (1.19)	2.31 (1.14)	0.09 (0.12)	0.06 (0.15)	0.14 (0.17)
Personal Initiative (0-1)	0.84 (0.13)	0.84 (0.13)	0.84 (0.14)	0.00 (0.01)	0.03 (0.02)	-0.01 (0.02)
Entrepreneurial Identity (0-1)	0.80 (0.20)	0.82 (0.18)	0.78 (0.21)	0.04* (0.02)	0.04 (0.03)	0.06** (0.03)
Entrepreneurial Locus of Control (0-1)	0.75 (0.19)	0.76 (0.18)	0.75 (0.19)	0.01 (0.02)	0.05** (0.02)	0.00 (0.03)
Self Efficacy (0-1)	0.81 (0.14)	0.82 (0.14)	0.80 (0.14)	0.02 (0.01)	0.05*** (0.02)	-0.02 (0.02)
Number of Observations	439	154	285	439	291	198

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

(1) Columns (1), (2) and (3) report means with standard deviations in parentheses.

(2) Column (4) reports the test of differences of means across columns (2) and (3). Columns (5) and (6) report the differences for loan applied/not applied and loan approved/rejected groups respectively.

(3) The majority of outcomes in Table 3 are captured during the baseline. The exception to this are the entrepreneurial characteristics (personal initiative, entrepreneurial identity, locus of control and self efficacy) and capital stock at business start that were asked at follow-up. Capital stock at business start was asked retrospectively to firms who were still operational during the follow-up survey.

TABLE 4—AVERAGE TREATMENT EFFECT ON AVERAGE YEARLY PROFITS

Table 4: Impact of WEDP Loans on Average Yearly Profits

	<b>Average Yearly Profits (Ethiopian Birr)</b>				
	ANCOVA (1)	ANCOVA with Controls (2)	DID with controls (3)	DID PSM Min Kernel (4)	DID PSM Max Kernel (5)
<i>Panel A (unconditional)</i>					
Loan_2014	572.0 (2,930)	-860.4 (2,918)	-11,726*** (4,390)	-10,585** (4,164)	-10,903*** (4,166)
Loan_2016	10,871*** (2,499)	9,571*** (2,488)	14,292*** (3,706)	19,439*** (3,686)	19,035*** (3,687)
Loan_2014*Post1			806.1 (6,746)	-914.5 (6,473)	-1,494 (6,475)
Loan_2016*Post2			9,756* (5,874)	8,021 (5,944)	8,514 (5,946)
<i>Panel B (conditional on business in operation)</i>					
Loan_2014	644.8 (2,920)	-706.0 (2,911)	-11,998*** (4,626)	-10,416** (4,385)	-10,725** (4,389)
Loan_2016	10,638*** (2,487)	9,540*** (2,478)	14,237*** (3,782)	19,426*** (3,762)	19,018*** (3,764)
Loan_2014*Post1			686.7 (6,920)	-1,422 (6,646)	-2,022 (6,650)
Loan_2016*Post2			9,281 (6,348)	7,548 (6,442)	7,805 (6,450)
Observations unconditional	4,640	4,634	4,634	4,631	4,630
Observations conditional	4,347	4,341	4,341	4,346	4,342
Control Mean pre-program existing firms (no loans)	41,917 (2,219)	41,917 (2,219)	41,917 (2,219)	41,917 (2,219)	41,917 (2,219)

*Notes:*

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

(1) The outcome variable is Average Yearly Profits in Ethiopian Birr winsorized at the 99th percentile.

(2) All regressions control for whether the firm received any WEDP business training and if the 2013 estimate was used for the pre-program outcome rather than 2012 estimate. The controls used in column (2) and (3) include age of the owner, education, marital status, household size, digitspan score (memory recall) and number of employees at baseline.

(3) Regressions in Panel A include the unconditional outcome where businesses that were closed at follow-up were set to zero and regressions in Panel B is conditional on the business being operational. In cases when a control variable is missing, its value is set to zero and a dummy is included for whether the variable is missing.

TABLE 5—AVERAGE TREATMENT EFFECT ON NUMBER OF EMPLOYEES

Table 5: Impact of WEDP Loans on Number of Employees

	Number of Employees			
	ANCOVA	ANCOVA with Controls	DID with controls	DID PSM Min Kernel
	(1)	(2)	(3)	(4)
<i>Panel A (unconditional)</i>				
Loan_2014	0.158 (0.226)	0.146 (0.188)	0.123 (0.182)	0.0809 (0.174)
Loan_2016	0.531*** (0.0865)	0.483*** (0.0878)	0.545*** (0.157)	0.709*** (0.157)
Loan_2014*Post1			0.240 (0.282)	0.238 (0.272)
Loan_2016*Post2			0.711*** (0.242)	0.694*** (0.246)
<i>Panel B (conditional on business in operation)</i>				
Loan_2014	0.178 (0.233)	0.164 (0.191)	0.161 (0.192)	0.136 (0.182)
Loan_2016	0.510*** (0.0809)	0.463*** (0.0796)	0.526*** (0.160)	0.694*** (0.160)
Loan_2014*Post1			0.196 (0.288)	0.180 (0.278)
Loan_2016*Post2			0.783*** (0.259)	0.753*** (0.265)
Observations unconditional	5,079	5,079	5,079	5,079
Observations conditional	4,776	4,776	4,776	4,776
Control Mean pre-program existing firms (no loans)	1.46 (0.0952)	1.46 (0.0952)	1.46 (0.0952)	1.46 (0.0952)

*Notes:*

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

- (1) The outcome variable is Number of employees winsorized at the 99th percentile.
- (2) All regressions control for whether the firm received any WEDP business training and if the 2013 estimate was used for the pre-program outcome rather than 2012 estimate. The controls used in column (2) and (3) include age of the owner, education, marital status, household size and digitspan score (memory recall).
- (3) Regressions in Panel A include the unconditional outcome where businesses that were closed at follow-up were set to zero and regressions in Panel B is conditional on the business being operational. In cases when a control variable is missing, its value is set to zero and a dummy is included for whether the variable is missing.

TABLE 6—AVERAGE TREATMENT EFFECT ON HOURS WORKED BY THE OWNER

Table 6: Impact of WEDP Loans on Hours Worked by the Business Owner

	<b>Hours worked by the business owner per week</b>				
	ANCOVA	ANCOVA with Controls	DID with controls	DID PSM Min Kernel	DID PSM Max Kernel
	(1)	(2)	(3)	(4)	(5)
<i>Panel A (unconditional)</i>					
Loan_2014	-1.718 (0.890)	-1.563 (0.836)	-3.066** (1.378)	-3.730*** (1.222)	-3.827*** (1.223)
Loan_2016	0.832 (0.821)	1.085 (0.866)	0.973 (1.188)	0.844 (1.104)	0.923 (1.104)
Loan_2014*Post1			1.084 (2.130)	1.551 (1.913)	1.712 (1.913)
Loan_2016*Post2			1.052 (1.832)	0.383 (1.734)	0.436 (1.735)
<i>Panel B (conditional on business in operation)</i>					
Loan_2014	-1.744 (0.994)	-1.442 (0.864)	-2.791** (1.362)	-3.545*** (1.233)	-3.612*** (1.235)
Loan_2016	-0.251 (0.552)	0.153 (0.596)	1.085 (1.129)	0.743 (1.073)	0.803 (1.074)
Loan_2014*Post1			0.784 (2.007)	1.262 (1.844)	1.406 (1.845)
Loan_2016*Post2			-2.699 (1.802)	-2.640 (1.745)	-2.455 (1.747)
Observations unconditional	5,042	5,039	5,039	5,037	5,036
Observations conditional	4,414	4,411	4,411	4,413	4,412
Control Mean pre-program existing firms (no loans)	67.37 (0.738)	67.37 (0.738)	67.37 (0.738)	67.37 (0.738)	67.37 (0.738)

*Notes:*

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

- (1) The outcome variable is number of hours worked by the owner in a typical week in Ethiopian Birr winsorized at the 99th percentile.
- (2) All regressions control for whether the firm received any WEDP business training and if the 2013 estimate was used for the pre-program level of the outcome rather than 2012 estimate. The controls used in column (2) and (3) include age of the owner, education, marital status, household size, digitspan score (memory recall) and number of employees at baseline.
- (3) Regressions in Panel A include the unconditional outcome where businesses that were closed at follow-up were set to zero and regressions in Panel B is conditional on the business being operational. In cases when a control variable is missing, its value is set to zero and a dummy is included for whether the variable is missing.

TABLE 7—AVERAGE TREATMENT EFFECT ON HOURS WORKED BY EMPLOYEES

Table 7: Impact of WEDP Loans on Hours Worked by Employees

	<b>Hours worked by employees per week</b>				
	ANCOVA (1)	ANCOVA with Controls (2)	DID with controls (3)	DID PSM Min Kernel (4)	DID PSM Max Kernel (5)
<i>Panel A (unconditional)</i>					
Loan_2014	8.241 (14.79)	8.944 (11.22)	6.537 (7.967)	9.797 (10.14)	10.26 (10.08)
Loan_2016	29.78*** (6.545)	25.34*** (6.074)	10.14 (6.853)	34.80*** (9.153)	33.46*** (9.103)
Loan_2014*Post1			16.49 (12.30)	15.67 (15.85)	15.50 (15.77)
Loan_2016*Post2			39.21*** (10.58)	38.94*** (14.38)	38.38*** (14.30)
<i>Panel B (conditional on business in operation)</i>					
Loan_2014	10.04 (16.85)	10.40 (12.66)	8.805 (8.792)	14.14 (11.37)	14.56 (11.29)
Loan_2016	29.51*** (7.027)	25.39*** (6.047)	10.20 (7.272)	33.60*** (9.885)	32.69*** (9.819)
Loan_2014*Post1			12.83 (12.94)	11.56 (16.98)	11.34 (16.87)
Loan_2016*Post2			42.85*** (11.62)	41.74*** (16.10)	40.65** (15.99)
Observations unconditional	5,072	5,072	5,072	5,072	5,072
Observations conditional	4,434	4,434	4,434	4,434	4,434
Control Mean pre-program existing firms (no loans)	93.28 (6.833)	93.28 (6.833)	93.28 (6.833)	93.28 (6.833)	93.28 (6.833)

*Notes:*

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

- (1) The outcome variable is number of hours worked by employees in a typical week in Ethiopian Birr winsorized at the 99th percentile.
- (2) All regressions control for whether the firm received any WEDP business training and if the 2013 estimate was used for the pre-program level of the outcome rather than 2012 estimate. The controls used in column (2) and (3) include age of the owner, education, marital status, household size, digitspan score (memory recall) and number of employees at baseline.
- (3) Regressions in Panel A include the unconditional outcome where businesses that were closed at follow-up were set to zero and regressions in Panel B is conditional on the business being operational. In cases when a control variable is missing, its value is set to zero and a dummy is included for whether the variable is missing.

TABLE 8—EXISTING FIRMS: WEDP BORROWERS VERSUS NON-BORROWERS

Table 8: Level differences for borrowers and non-borrowers in 2016 follow-up for existing firms

Existing firms (1,700 firms)	Average treatment effect of the loans on the treated: WEDP borrowers versus no loans			
	OLS	OLS with controls	PSM Min	PSM Max
	(1)	(2)	(3)	(4)
<i>Panel A (Business performance outcomes)</i>				
Average monthly profits (ETB)	2,419*** (426.2)	1,626*** (431.6)	1,852*** (471.1)	1,809*** (523.5)
Average yearly profits (ETB)	17,367*** (3,811)	9,820** (3,832)	10,427** (4,569)	9,995** (4,229)
Average monthly revenues (ETB)	23,555*** (3,406)	17,184*** (3,419)	18,854*** (4,192)	18,732*** (4,168)
Average monthly business costs (ETB)	27,718*** (3,411)	18,778*** (3,430)	21,899*** (4,123)	21,767*** (3,874)
Number of workers (Number)	1.323*** (0.150)	0.970*** (0.153)	1.194*** (0.176)	1.166*** (0.179)
Hours worked by employees (Hrs per week)	77.84*** (10.45)	61.24*** (10.41)	68.96*** (10.71)	67.34*** (12.17)
Hours worked by owner (Hrs per week)	-1.705 (1.304)	-1.257 (1.318)	-2.142* (1.273)	-2.078* (1.218)
Capital Stock (machinery) (ETB)	67,066** (30,171)	26,615 (30,146)	64,037* (35,829)	63,181* (33,658)
<i>Panel B (Business practices)</i>				
Has a written business plan (Yes=1; No=0)	0.107*** (0.0163)	0.0765*** (0.0164)	0.0744*** (0.0179)	0.0733*** (0.0177)
Has a written annual budget (Yes=1; No=0)	0.0514*** (0.0156)	0.0288* (0.0159)	0.0400** (0.0171)	0.0392** (0.0186)
Keeps financial records (Yes=1; No=0)	0.106*** (0.0192)	0.0744*** (0.0191)	0.0938*** (0.0189)	0.0936*** (0.0182)
New products introduced yr (Yes=1; No=0)	0.0324* (0.0168)	0.0327* (0.0169)	0.0262* (0.0157)	0.0255 (0.0179)
Number of new customers daily	3.073** (1.439)	2.916* (1.523)	3.320* (1.725)	3.317* (1.717)
Number of business ideas in past 6m (Num)	0.333 (0.245)	0.369 (0.248)	0.286 (0.284)	0.292 (0.225)
Marketing expenses in past 6months (ETB)	300.2 (1,215)	254.6 (1,288)	-217.5 (1,323)	-216.5 (1,379)

*Notes:*

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

(1) Outcomes presented in the table are reported in the follow-up survey conducted in 2016.

(2) Results for nearest neighbor matching are not materially different from the kernel matching results presented.

(3) Regressions in column (2) include controls for age of the owner, education, marital status, household size and digitspan score (memory recall) which could be different in the two survey rounds. In cases when a control variable is missing, its value is set to zero and a dummy is included for whether the variable is missing.

(4) PSM Min (column 3) calculates the propensity score using entrepreneurial characteristics alone and PSM Max (column 4) calculates the propensity score using entrepreneurial characteristics plus firm size.

TABLE 9—START-UP FIRMS: WEDP BORROWERS VERSUS NON-BORROWERS

Table 9: Level differences for borrowers and non-borrowers in 2016 follow-up for start-up firms

<b>Start-up firms (439 firms)</b>	Average treatment effect of the loans on the treated: WEDP borrowers versus no loans			
	OLS (1)	OLS with controls (2)	PSM Min Kernel matching (3)	PSM Max Kernel matching (4)
<i>Panel A (Business performance outcomes)</i>				
Average monthly profits (ETB)	1,773*** (584.9)	1,344** (604.4)	1,410** (644.0)	1,413** (649.9)
Average yearly profits (ETB)	1,135 (5,771)	-3,218 (5,872)	-2,943 (5,854)	-2,922 (5,777)
Average monthly revenues (ETB)	3,568 (4,916)	1,511 (5,182)	1,934 (4,979)	1,949 (4,976)
Average monthly business costs (ETB)	6,800 (4,402)	3,013 (4,644)	4,471 (4,513)	4,519 (4,123)
Number of workers (Number)	0.202 (0.236)	-0.148 (0.246)	0.00922 (0.249)	0.0149 (0.249)
Hours worked by employees (Hrs per week)	23.75 (17.31)	4.728 (17.36)	16.51 (18.02)	16.93 (19.38)
Hours worked by owner (Hrs per week)	-3.850 (2.587)	-2.191 (2.618)	-2.305 (2.817)	-2.347 (2.716)
Capital Stock (machinery) (ETB)	396,823*** (71,717)	360,178*** (73,596)	400,727*** (89,164)	401,513*** (97,709)
<i>Panel B (Business practices)</i>				
Has a written business plan (Yes=1; No=0)	0.0170 (0.0312)	-0.0234 (0.0325)	-0.0178 (0.0296)	-0.0170 (0.0365)
Has a written annual budget (Yes=1; No=0)	0.0583** (0.0274)	0.0476 (0.0293)	0.0470 (0.0344)	0.0471* (0.0277)
Keeps financial records (Yes=1; No=0)	0.0993*** (0.0362)	0.0627* (0.0373)	0.0818** (0.0351)	0.0825** (0.0378)
New products introduced yr (Yes=1; No=0)	0.00796 (0.0337)	0.0178 (0.0349)	0.0128 (0.0346)	0.0124 (0.0300)
Number of new customers daily	2.513* (1.507)	2.244 (1.635)	2.574 (1.817)	2.597 (2.131)
Number of business ideas in past 6m (Num)	0.826 (0.506)	0.788 (0.522)	0.901** (0.455)	0.898* (0.545)
Marketing expenses in past 6months (ETB)	506.2 (431.1)	340.5 (474.3)	558.1 (662.3)	558.2 (646.8)

*Notes:*

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

(1) Outcomes presented in the table are reported in the follow-up survey conducted in 2016.

(2) Results for nearest neighbor matching are not materially different from the kernel matching results presented.

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(4) PSM Min (column 3) calculates the propensity score using entrepreneurial characteristics alone and PSM Max calculates the propensity score using entrepreneurial characteristics plus firm size.

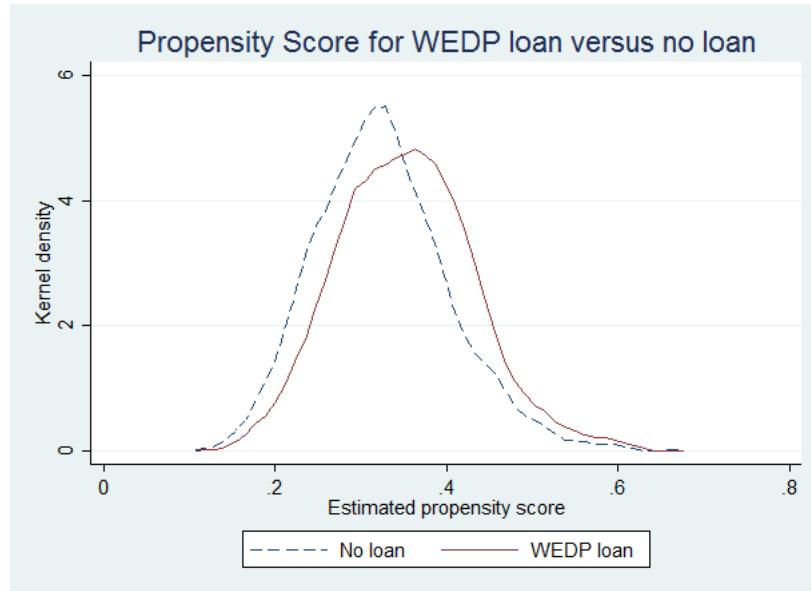


FIGURE 3. PROBABILITY OF RECEIVING A LOAN BASED ON OBSERVABLE CHARACTERISTICS

Estimation of the propensity score							Balancing property satisfied																																																																																			
Iteration 0:	log likelihood =	-4073.8116					Iteration 0:	log likelihood =	-4073.9116																																																																																	
Iteration 1:	log likelihood =	-3982.7518					Iteration 1:	log likelihood =	-3982.6413																																																																																	
Iteration 2:	log likelihood =	-3982.6493					Iteration 2:	log likelihood =	-3982.64107																																																																																	
Iteration 3:	log likelihood =	-3982.6493					Iteration 3:	log likelihood =	-3982.64107																																																																																	
Probit regression							Probit regression, reporting marginal effects																																																																																			
	Number of obs	=	6396					Number of obs	=	6396																																																																																
	LR chi2(7)	=	182.52					LR chi2(8)	=	183.00																																																																																
	Prob > chi2	=	0.0000					Prob > chi2	=	0.0000																																																																																
	Pseudo R2	=	0.0224					Pseudo R2	=	0.0225																																																																																
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FIGURE 4. PROBIT REGRESSION OF PROPENSITY SCORE AND TEST OF BALANCING PROPERTY