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# Does the Small Business Programme Benefit Self-Employed Workers? Evidence from Nicaragua

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# Does the Small Business Programme Benefit Self-Employed Workers? Evidence from Nicaragua*

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Abstract

Business and skills training programmes have been a popular social policy intervention to improve the performance of self-employment in developing countries. We study the Small Business of the Family Economy programme, a government business training programme designed to assist Nicaraguan self-employed workers. Using data from three rounds of the Nicaragua Living Standards Measurement Survey, we employ a difference-in-differences strategy to exploit variation in eligibility for the programme across time and economic activity. Our estimates indicate that the programme does not increase self-employed workers' income overall. However, we find heterogeneous treatment effects for female self-employed workers with low educational attainment, which could be explained by increased working months and having a second job.

Keywords: self-employment, small business, business training, difference-in-differences, propensity score matching, Nicaragua

JEL Codes: J24, O12, L26, M53

## 1. Introduction

In developing countries where wage and salary employment are limited, self-employment is common and accounts for a sizable portion of the labour force (Fields 2019; Gindling and Newhouse 2014). Typical self-employment policies include (i) microfinance (loan) or cash transfer (grant) and (ii) technical (vocational) and business (managerial) training programmes (Cho and Honorati 2014).

One of the most popular approaches among these social programmes has been microfinance, which is based on the premise that a lack of access to financial capital is a barrier to small-scale business development. Early evidence from non-randomised microfinance evaluations generally reported positive effects, particularly for the extremely poor (Khandker 2005; Pitt and Khandker 1998). However, recent experimental evaluations of microfinance have found no or mixed effects on microenterprise and income growth (Banerjee, Karlan, and Kinnan 2015). Six randomised microfinance studies conducted in Bosnia and Herzegovina (Bruhn and Zia 2013), Ethiopia (Tarozzi, Desai, and Johnson 2015), India (Banerjee et al. 2015), Mexico (Angelucci, Karlan, and Zinman 2015), Mongolia (Attanasio et al. 2015), and Morocco (Crépon et al. 2015) show that microfinance positively affects self-employment activities, but it has no significant impact on profits or overall household income.[1]

Although there is still optimism about the power of financing support (especially grant type) for microenterprises (Blattman and Dercon 2018; Blattman, Fiala, and Martinez 2013), awareness that business success may depend on nonfinancial services (e.g. business training) and nontraditional training (e.g. gender-oriented training for women and psychology-based training programmes) is increasing (Arráiz et al. 2019; Campos et al. 2017; McKenzie and Puerto 2021). The related literature investigated the combined effects of financial capital and business training and reported mixed results on

profits and incomes ranging from no effects (Bjorvatn and Tungodden 2010; Giné and Mansuri 2021; Karlan and Valdivia 2011) to dissipating short-term effects (de Mel, McKenzie and Woodruff 2014) or long-term effects (Berge, Bjorvatn, and Tungodden 2015).[2]

Due to the mixed results of business training on self-employment, it is difficult to draw consistent policy implications for supporting self-employment, and more evidence in different settings and contexts is required. Furthermore, most previous studies on business training was based on loan clients of microfinance institutions (MFIs) who were willing to participate in business training. Those who obtain loans from MFIs may be systematically different from the average self-employed workers (Beaman et al. 2014), and this endogenous selection into credit markets makes it even more challenging to generalise the findings of randomised business training evaluations beyond MFI clients.

This paper examines the Nicaraguan government's social programme to encourage self-employment in a quasi-experimental setting with a representative sample of self-employed workers in Nicaragua. We investigate the effects of Nicaragua's Small Business of the Family Economy (SBFE) programme, which aims to improve the capabilities of self-employed workers by providing business training and information and skill development in five sectors: 1) agriculture, 2) forestry; 3) manufacturing, 4) commerce and services; and 5) construction. We use representative national survey data from the Living Standards Measurement Survey (LSMS) conducted by the National Institute of Development Information of Nicaragua. We focus on intent-to-treat effects using a difference-in-differences method, exploiting variation in the timing of the introduction of the SBFE programme and the programme eligibility.

Our estimates indicate that the SBFE programme does not increase the overall income of self-employed workers, which is consistent with the findings of Cho and

Honorati (2014), who discussed various entrepreneurship programmes in developing countries and reported that those programmes have no immediate translation into increased income. However, we find strong heterogeneous treatment effects for female self-employed workers with low educational attainment. The SBFE programme is associated with a 14.5% increase in female self-employment income for those with primary education or less, and an 18.3% increase for those with secondary education. These heterogeneous treatment effects are consistent with previous research that found a positive impact of business training on the profits of female-run microenterprises (Arráiz et al. 2019; Bruhn and Zia 2013; Bulte, Lensink, and Vu 2017; McKenzie and Puerto 2021).[3]

The remainder of the paper is structured as follows. Section 2 describes the SBFE programme and its policy context. Section 3 describes the data, and Section 4 defines the eligibility status and presents the empirical strategy. Section 5 discusses the programme's effects on self-employed workers' income with heterogeneous treatment effects and robustness checks. Finally, Section 6 concludes.

## 2. The SBFE Programme

The Nicaraguan government established the Ministry of Family Economy, Community, Cooperative, and Associative (Ministerio de Economía Familiar, Comunitaria, Cooperativa, y Asociativa, MEFCCA by its acronym in Spanish). The MEFCCA's main goal is to promote and support small and medium-sized enterprises (SMEs), and the commercialisation of their products, to improve the quality and productivity of those businesses. The establishment of this ministry marks a shift toward the inclusion of self-employed individuals in the Government's social programmes.

In 2012, the MEFCCA and the National Institute of Technology (Instituto Nacional de Tecnología, INATEC by its acronym in Spanish) launched the SBFE, formerly known as the "Micro, Pequeña y Mediana Empresa" programme.[4] The SBFE programme was designed to target individuals who want to develop or start their own business; they are mostly self-employed workers of SMEs in the agriculture, forestry, manufacturing, commerce and services, and construction sectors.

The main goal of the SBFE programme is to improve and strengthen the capabilities of self-employed workers through training and the establishment of sustainable businesses.[5] The SBFE programme offered four types of training: (1) business plans; (2) business organisation; (3) networking, virtual store establishment, and access to new markets; and (4) administrative techniques.

The following three characteristics of the SBFE programme differentiated itself from the previous traditional business training programmes. Firstly, the SBFE programme encouraged female self-employed workers to participate, emphasising their importance as economic agents in the local economy where the programme was implemented.[6] Secondly, the programme included a local customization component that allowed participants to become more immersed in their local market and gain better experience and knowledge about their potential customers. Thirdly, the SBFE programme's treatment intensity was significantly higher than that of most previous business training programmes in other contexts. The SBFE programme included a three-month training (100 hours total) and follow-up strengthening tutoring (4 hours)[7].

Furthermore, the SBFE programme ensured that all participants developed business development plans to market their SMEs. The programme also facilitated small business registration through the MEFCCA's information system. This aimed to improve

the corporate image of SMEs while also facilitating access to local markets for their products.

## 3. Data

To examine the impact of the SBFE programme on the self-employed workers' income, we use the data from the LSMS conducted by the National Institute of Development Information of Nicaragua. The LSMS is a national survey that covers both urban and rural areas. For data collection, the country was divided into census segments, each of which contained approximately 150 urban households and 120 rural households. Our dataset (Kim et al. 2022) consists of three LSMS waves (2005, 2009, and 2014). Since the Nicaraguan government launched the SBFE programme in 2012, we consider the 2009 and 2014 waves to be the programme's pre-intervention and post-intervention periods, respectively. By analysing the 2005 and 2009 waves, we check the parallel trend assumption.

We restrict the sample by including self-employed workers only. A self-employed person is identified as an individual who recognises himself/herself as self-employed and whose primary activity during the previous week of the survey interview was in a SMEs that did not involve hiring any workers. We do not consider self-employed workers or unpaid family workers as second or third occupations. Furthermore, we only target self-employed people aged 14 and up, which is the legal working age in Nicaragua and the minimum age required to participate in the SBFE programme.

Each individual's income is also included in the LSMS dataset. Given that the LSMS income is reported in nominal terms, we calculate the real income for self-employed workers using the Central Bank of Nicaragua's Consumer Price Index (CPI). All regression results are presented in 2006 Nicaraguan córdobas. Table 1 summarises

the statistics for self-employed and paid-employed workers across all years of the LSMS sample (2005, 2009, and 2014). In Panel A, 54% of the self-employed sample are male, with an average age of 39 years and 6.54 years of education. Moreover, 65% of them live in the urban area, and 70% qualify for the SBFE programme. The key variable, self-employment eligibility status, remains stable across survey years (71% in 2005, 69% in 2009, and 69% in 2014), whereas their real incomes increase (1,683 in 2005, 2,354 in 2009, and 2,493 in 2014).

[Table 1]

## 4. Empirical Strategies

This section explains the eligibility for the SBFE programme and presents the empirical strategies.

### *4.1 Eligibility Status*

The eligibility variable is constructed using the information in the LSMS dataset. The LSMS questionnaire contains the following question: "What is the main economic activity of your occupation or the place you work?" Using the CUAEN, we coded this question to obtain 104 economic activities for self-employed workers. Out of these 104 economic activities, 50 are eligible for the SBFE programme, and the remaining activities include non-eligible individuals. This variable is used to create the eligibility measure of the programme. In Table A1, we present all of the economic activities for all years using the 3-digit CUAEN codes. We rely on intent-to-treat (ITT) analysis because we cannot determine whether the individual was treated or not by the SBFE programme. ITT analysis suggests an unbiased lower-bound of the treatment effect free of noncompliance, withdrawal, and protocol deviation of the individuals (Gupta 2011).

Individual self-employed workers' eligibility for the SBFE programme is not randomly assigned, and thus, significant differences exist between eligible and non-eligible people in terms of demographic and socioeconomic covariates, as well as pre-intervention outcome level. To address these disparities, we employ a propensity score matching (PSM) method to construct a valid comparison group to the treatment group of interest. [8]

The propensity score is a conditional probability of being treated, given a set of observable covariates. The PSM estimator contains two identifying assumptions: unconfoundedness and overlap. The first assumption implies that the differences in outcomes between treatment and control groups are attributed to the intervention as follows: $(Y_1, Y_0) \perp D|X$, where $Y_1$ and $Y_0$ are potential outcomes for each individual *i*, *D* is the assignment, and *X* are the covariates. This implies that the selection into treatment is based only on observable factors; that is, $Y_1$ and $Y_0$ are independent of treatment *D* once we account for observed characteristics, allowing us to estimate the average treatment effect (Rosenbaum and Rubin 1983; Caliendo and Kopeinig 2008). The second assumption is also known as the condition of common support, which can be expressed as $0 < P(D = 1 \mid X) < 1$. This assumption ensures that all individuals with the same values of *X* can participate in the programme (Heckman, LaLonde and Smith 1999).

Table 2 shows the distinctions between the eligible and ineligible groups. Prior to using propensity score matching, we found that the two groups had significant differences in gender, age, household size, area of residency, secondary completed or less, and real income. However, after the matching, all covariates (Panel A) and pre-intervention real income (Panel B) become balanced between the eligible and non-eligible groups. We also plot the bias correction in Appendix Figure A1 using the standardised percent of bias

across the key covariates reported in Panel A (Caliendo and Kopeinig 2008). After the PSM is applied, the standardised bias across covariates is within 0% in contrast to the unmatched sample. All of the estimations presented in the following sections are based on the matched sample.

[Table 2]

### *4.2 Identification Strategy*

When both the unconfoundedness and overlap assumptions are satisfied, the treatment assignment becomes independent in the presence of a vector of covariates $X$. However, if the treatment assignment is influenced by unobserved factors, the PSM will still provide a biassed estimate. This concern can be alleviated by using a difference-in-differences (DID) approach, which eliminates unobserved time-invariant factors between individuals that may affect the outcome variable, thereby reducing the possibility of selection bias that may occur when using the PSM alone (Heckman et al. 1997). Thus, our main empirical strategy employs a standard DID method, taking advantage of variations in the timing of the programme's introduction and eligibility for the SBFE programme. As a result, our identification strategy is two-pronged. First, it is based on the difference in exposure before and after treatment among eligible self-employed workers. Second, because other changes may be occurring across the country, we use the corresponding counterparts who were not eligible for the SBFE programme to account for any concurrent changes. The following is the baseline estimating equation:

$$Y_{it} = \alpha + \beta Post_t + \gamma Eligibility_i + \delta(Post_t \times Eligibility_i)$$

$$+\mathbf{X}'_{it}\omega + \tau_r + \pi_o + \sigma_p + \varepsilon_{it}, \qquad (1)$$

where $Y_{it}$ is the outcome variable (mainly, real income) for individual *i*, which is the logarithm of the real income; $Eligibility_i$ is a dummy variable that takes the value of 1 if individual $i$ is eligible for the SBFE programme and 0, otherwise; $Post_t$ is another dummy variable that takes the value of 1 if the period is 2014 and 0 if it is 2009. Thus, $\delta$ represents the coefficient of interest that shows the effect of the SBFE programme given the interaction between *Post* and *Eligibility*. $\mathbf{X'}_{it}$ is a vector of individual characteristics that may affect income, including gender, age, household size, years of education, and area of residence, as summarised in Table 1. $\tau_r$ is a regional fixed effect that absorbs geographically restricted shocks affecting the real income of self-employed workers; and $\pi_o$ is occupational fixed effects. Meanwhile, $\sigma_p$ is a letter-code economic activity fixed effect that absorbs non-observable, time-invariant, sector characteristics, and $\varepsilon_{it}$ is the error term clustered at eighteen letter-code activities by year.

Although we combine the DID approach with the PSM and include a comprehensive list of control variables, our estimates may be biassed if the eligibility measure captures other variables relevant to the outcomes, such as eligibility for other social programmes and sectoral changes over time. However, the following factors may help to alleviate this concern.

First, the MEFCCA and the National Institute of Technology (INATEC) implemented a number of social programmes, but they were limited in coverage and did not directly target Nicaragua's self-employed. Unlike other Latin American countries, the Government of Nicaragua did not implement conditional cash transfer programmes or social programmes to assist self-employed workers in the sectors targeted by the SBFE programme during the time of this study (The World Bank 2017). MEFCCA and INATEC also ran other social programmes, such as Hambre Cero, Merianda Escolar, Proyecto Agora, and Programa Amor, but their primary goal was to alleviate poverty. The

beneficiaries of these programmes were mostly children, women, the elderly, and people with disabilities, many of whom were poor and unable to work. To the best of our knowledge, there were no other similar and contemporaneous programmes that could potentially influence our SBFE programme estimates.

Second, potential estimation bias from the sector-wide changes over the period could be alleviated because we use within-sector variations among 104 economic activities in the five eligible sectors. In addition, one might be concerned with the sectoral patterns in the 50 economic activities eligible for the SBFE Programme before and after the implementation. However, the composition of the eligible status of those economic activities using their CUAEN letter code did not significantly change. For example, the economic sector of agriculture, hunting, and forestry had about 34.8 % of all workers in 2005, 35.4% in 2009, and32.4% in 2014 (Socio-Economic Database for Latin America and the Caribbean, 2022). Likewise, the overall composition of the self-employed in Nicaragua did not change during the sample period. The percentage of self-employed workers is consistent across years; approximately 31% of all workers in the LSMS were self-employed workers.

### *4.3 Parallel trend assumption test*

This section tests the validity of the DID model's parallel trend assumption. The key assumption for justifying the DID method is that real income trends in eligible and non-eligible sectors would have been the same in the absence of the programme. Using the pre-intervention samples from 2005 and 2009, we run equation (1), which considers 2005 to be the pre-period of the SBFE programme and 2009 to be the post-period. Given that the SBFE was implemented in 2012, we anticipate that the interaction between *Post* and *Eligibility* will be non-significantly different from zero.

Table 3 shows the estimates of the parallel trend test with the matched sample. Column (1) contains estimates with no controls. Individual controls are included in column (2). Column (3) also accounts for regional fixed effects, which capture the significance of geographical differences in real income. Columns (4) and (5) show the estimates with occupation and letter-code fixed effects. Overall, the estimates in all specifications are not statistically significant, and including a different set of controls has no differential effect on the estimates. These findings support the robustness of the DID model's parallel trend assumption in this context.

[Table 3]

## 5. Results

### *5.1 Estimating the effect of the SBFE on income*

We now turn to the DID estimates from the 2009 and 2014 LSMS waves using a sample of self-employed workers. Table 4 summarises our main findings, with columns (3), (6), and (9) representing the specifications described in equation (1). Overall, the estimates indicate that the introduction of the SBFE has no statistically significant impact on the income of self-employed workers. This finding is similar to that of Cho and Honorati (2014), who used a meta-analysis to examine a different set of entrepreneurship programmes and showed that those programmes have no immediate impact on income. However, the SBFE programme is linked to the earnings of female self-employed workers (an increase of 7.5% at the 5% level). This suggests possible heterogeneous treatment effects on female self-employed workers.[9]

[Table 4]

### *5.2 Heterogeneous treatment effects*

One possible dimension for heterogeneous treatment effects is the educational attainment of self-employed workers. To examine the effects of the SBFE programme on education, we divide the sample into three mutually exclusive sub-groups: (1) people with primary education or below (no education up to 6 years of schooling); (2) people with secondary education or below (between 7 and 11 years of schooling); and (3) people with higher than secondary education (12 years of schooling or above). Table 5 shows that the programme effect is concentrated on those with low educational attainment. The SBFE programme is associated with 14.5% (column 2) and 18.3% (column 5) income increases for female self-employed workers with primary and secondary education, respectively, whereas there is no programme correlation for those with higher education (columns 7–9). Female self-employed workers are driving these disparate programme impacts. We do not find any significant association for males regardless of their educational attainment. In addition, we find no significant correlation between female self-employment and higher educational attainment (column 8).

These findings are consistent with those of Arráiz et al. (2019) and Bruhn and Zia (2013), who reported that the majority of programme impacts came from female self-employed workers rather than male counterparts. The magnitude of these heterogeneous treatment effects on profits is in the range of a 15.4% increase over three years (McKenzie and Puerto 2021). However, related literature indicates that female-run microenterprises have no significant impact on profits in the Dominican Republic (Drexler, Fischer, and Schoar 2014), India (Field, Jayachandran, and Pande 2010), Pakistan (Giné and Mansuri 2021), Peru (Karlan and Valdivia 2011), and Tanzania (Berge, Bjorvatn, and Tungodden 2015).

Although previous studies used a randomised field experiment design, ensuring

the results' internal validity, their study samples were primarily drawn from loan clients of partner MFIs who were interested in participating in a business training programme. We analyse self-employed workers in Nicaragua regardless of their microcredit-taking status and personal interest in receiving business training using representative samples of the Nicaraguan general population. Thus, the discrepancy between our findings and previous findings could be attributed to a trade-off between sample representativeness and internal validity.

We also investigate whether age differences are a source of heterogeneity. In the 2009 and 2015 LSMS waves, the median age of self-employed workers was 39 years old. Table 6 shows that the SBFE programme is associated with an 11.3% increase in female self-employed workers under the median age (at the 1% significance level). We find no significant relationship between the programme and the income of male self-employed workers of any age.

[Table 6]

### *5.3 Falsification test*

A falsification test can be used to test the heterogeneous treatment effects of education on female self-employed workers. We estimate equation (1) using only paid-employed workers who are not eligible for the SBFE programme. We expect the estimates to be statistically insignificant because the SBFE does not target paid-employed workers. Table 7 shows that the programme has no effect on paid-employed workers regardless of gender or education level. In all heterogeneity analyses, the estimates from this falsification test are small in magnitude and statistically insignificant.

[Table 7]

### *5.4 Possible mechanism for the programme impact*

Finally, we examine possible channels such as whether an individual has received any other formal training in the last 12 months, the number of working months, and the likelihood of having a second job to explain the positive programme impact on the income of female self-employed workers. In Nicaragua, 3.6% of the self-employed sample received formal training in the previous 12 months[10] and the self-employed worked 10.5 months per year on average, with 9.7% having a second job.

Table 8 displays the results for these outcomes. We find no significant impact of the SBFE programme on these variables in the overall sample (Panel A). However, Table 8 Panel B clearly shows that female self-employed workers are more likely to work more (0.467 months) and to have a second job by 5 percentage points (51%). Meanwhile, Panel C reports that none of these possible channels are statistically significant for male self-employed workers except training at the 5% level. These findings indicate that female self-employed workers improved their income by extending their working months and job portfolio. Overall, the SBFE programme's training was intended to encourage self-employed workers, particularly women, to participate in an exchange of knowledge and experiences about business planning, goals and objectives, and financial education.

[Table 8]

## 6. Discussion and Conclusion

This paper estimates the effects of the SBFE programme in Nicaragua on self-employed worker's income. Self-employed workers are frequently regarded as the dominant form of economic activity in developing countries such as Nicaragua, and thus, it is critical for

policymakers to design efficient labour market policies to support self-employed workers.

We find that the SBFE programme is associated with higher earnings for female self-employed workers with lower educational attainment and a younger cohort. These findings are consistent with previous research indicating that business training has a positive impact on the profits of female-run microenterprises (Arráiz et al. 2019; Bruhn and Zia 2013; Bulte, Lensink, and Vu 2017; McKenzie and Puerto 2021). However, related literature indicates that female-run microenterprises have no significant impact on profits in several countries.

One possible explanation for the disparity between our findings and the related literature with no effect on women is that we examined all self-employed workers from a nationally representative survey (the Nicaragua LSMS), whereas previous literature based on randomised field experiments mostly targeted loan clients of MFIs who are willing to participate in business training programmes. Another aspect of the SBFE programme's strong gender effect can be considered in the context of the Nicaragua labour market. Field, Jayachadran, and Pande (2010) suggest that cultural and labour market discrimination against females in India could be a reason for no effect of business training on female entrepreneurs. The labour market structure in Nicaragua has been relatively favourable for female workers. Meanwhile, according to the Socio-Economic Database for Latin America and the Caribbean, the share of female workers in total employment in Nicaragua increased from 42% in 1993 to 57% in 2014, indicating lower labour market discrimination against women in the country.

The fact that we have no significant programme impact on male self-employed workers needs to be investigated further. When the MEFCCA launched the SBFE programme in Nicaragua, it targeted both male and female self-employed workers, with

a special emphasis on women empowerment. Understanding why the SBFE programme was ineffective for male self-employed workers may shed light on policy implications for business and skills training in developing countries in the future.

The main limitation of this study is that we do not identify the programme intervention at the individual level and do not know who received the training because we do not have access to administrative data. Given that our ITT estimates for female self-employed workers are still sizable and statistically significant, the true impact of the programme calculated by treatment on the treated estimates could be greater than the results presented here. Another limitation is that programme eligibility was not randomly assigned, and there may be systematic differences in both observable and unobservable characteristics between the eligible and non-eligible groups, although we fully utilised quasi-experimental approaches such as PSM, DID, and various fixed effects. As a result, our claims about the SBFE programme's causal effects on self-employed workers' real income should be viewed with caution.

Although these findings are specific to self-employed workers in Nicaragua, with the caveats mentioned above, they may provide some insights to other developing countries with a high level of informal economic activity and self-employment when it comes to targeting the right beneficiaries of business training programmes.

## Notes

[1] Although the overall microfinance impact on business profits or income from these studies are weak and imprecisely measured, some reported that microfinance increased profits for pre-

existing business (Banerjee et al. 2015) and income from self-employment activities (Crépon et al. 2015).

[2] Many studies analysed the effects of business training separately (Bruhn and Zia 2013; Drexler, Fischer, and Schoar 2014; Field, Jayachandran, and Pande 2010; Valdivia 2015).

[3] Related literature also reports no significant impact for female entrepreneurs (Berge, Bjorvatn, and Tungodden 2015; Drexler, Fischer, and Schoar 2014; Field, Jayachandran, and Pande 2010; Giné and Mansuri 2021; Karlan and Valdivia 2011).

[4] This is translated to Micro, Small and Medium Enterprises in English.

[5] The programme requires the following documentation and conditions; (1) copy of birth certificate or identification card; (2) copy of the last academic grades or certificates showing that the individual can read and write; (3) 14 years or older for the training in the commerce and service sector; (4) 16 years or older for the training in the manufacturing and construction sector; and finally (5) the individual should desire to be trained. Self-employed workers who want to participate in the programme must fill a form at the MEFCCA. Then, they are assigned to the INATEC to coordinate the day in which that training will be performed and the number of training hours to be held.

[6] The MEFCCA and the INATEC have consolidated a strategy to improve education, skills, and jobs especially for female self-employed workers while emphasizing women's participation in the SBFE programme and job creation in the productive sectors (World Bank 2017).

[7] None of the related studies reported a training duration of more than 100 hours. For example, Brook, Donovan, and Johnson (2018) implemented a business training programme in Nairobi, Kenya, consisting of four two-hour classes (only eight hours). Similarly, Bruhn and Zia (2013) implemented a nine-hour-long business training programme in Bosnia and Herzegovina (spread out over three days of three-hour training each). Relatively more intensive business training programs, such as Campos et al. (2017) and Giné and Mansuri (2021), provided 36

and 46 hours of training, respectively, which are still less than half of the total training hours provided in the SBFE programme.

[8] In this study, we implement full Mahalanobis matching using the 10 nearest neighbours without a caliper. Using different matching algorithms such as kernel and radius matching or increasing/decreasing the number of neighbours does not significantly change the main results.

[9] Table A2 examines the results of the test for parallel trends by gender. We do not find any systematic difference for female self-employed workers (columns 4–6) between the eligible and non-eligible groups during 2005–2009 period.

[10] We believe that the formal training dummy in our dataset does not fully capture the true participation in the SBFE programme for the following reasons. First, we acknowledge that we do not have a precise measure for training take-up due to a lack of access to the administrative data. However, the Government of Nicaragua (2016) reported that 197,356 self-employed workers participated in the SBFE programme in 2014 and around 200,000 self-employed people each year for the following five years are expected to participate in the SBFE programme. The SBFE programme coverage is large enough to support a significant portion of self-employment in Nicaragua. Second, the SBFE programme was provided mainly in the capital city and major cities while our sample covers the whole Nicaragua population. Thus, the formal training dummy could be systematically underestimated.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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Table 1: Summary statistics for self-employed and paid-employed workers in the LSMS

| | | All years | 2005 | | 2009 | | 2014 | |
|---|---|---|---|---|---|---|---|---|
| Variable | N | Mean / (SD) | N | Mean / (SD) | N | Mean / (SD) | N | Mean / (SD) |
| *Panel A. Self-employed workers* | | | | | | | | |
| Gender | 11285 | 0.54 | 4082 | 0.62 | 3847 | 0.55 | 3356 | 0.44 |
| Age | 11285 | 38.99 (11.42) | 4082 | 38.93 (11.44) | 3847 | 38.85 (11.40) | 3356 | 39.22 (11.42) |
| Household size | 11285 | 5.46 (2.63) | 4082 | 5.98 (2.79) | 3847 | 5.38 (2.62) | 3356 | 4.92 (2.31) |
| Years of education | 10071 | 6.54 (4.24) | 2868 | 5.87 (3.49) | 3847 | 6.39 (4.45) | 3356 | 7.29 (4.47) |
| Area of residency: urban | 11285 | 0.65 | 4082 | 0.44 | 3847 | 0.72 | 3356 | 0.81 |
| Real income | 11095 | 2150.21 (2393.47) | 4060 | 1683.35 (2030.89) | 3759 | 2354.96 (2462.52) | 3276 | 2493.87 (2626.63) |
| Received training | 11285 | 0.03 | 4082 | 0.03 | 3847 | 0.03 | 3356 | 0.05 |
| Eligibility (%) | 11257 | 0.70 | 4082 | 0.71 | 3836 | 0.69 | 3339 | 0.69 |
| *Panel B. Paid-employed workers* | | | | | | | | |
| Gender | 15983 | 0.57 | 4472 | 0.57 | 5487 | 0.57 | 6024 | 0.56 |
| Age | 15983 | 33.25 (11.04) | 4472 | 31.87 (10.98) | 5487 | 33.47 (10.93) | 6024 | 34.06 (11.09) |
| Household size | 15983 | 5.49 (2.65) | 4472 | 6.12 (2.84) | 5487 | 5.36 (2.57) | 6024 | 5.15 (2.48) |
| Years of education | 15587 | 9.66 (4.42) | 4076 | 9.01 (4.21) | 5487 | 9.52 (4.43) | 6024 | 10.22 (4.48) |
| Area of residency: urban | 15983 | 0.85 | 4472 | 0.75 | 5487 | 0.87 | 6024 | 0.91 |
| Real income | 15863 | 2725.06 (2089.03) | 4445 | 2210.94 (1958.23) | 5441 | 2795.35 (2072.75) | 5977 | 3043.41 (2125.65) |
| Received training | 15983 | 0.11 | 4472 | 0.13 | 5487 | 0.09 | 6024 | 0.11 |
| Eligibility (%) | 12998 | 0.52 | 3556 | 0.50 | 4500 | 0.53 | 4942 | 0.54 |

Notes: This table presents summary statistics for the overall sample and each LSMS wave sample (2005, 2009, and 2014). Gender is a dummy variable that equals 1 if the individual is male and 0 otherwise. Area of residency is a dummy variable that equals 1 if the individual lives in an urban area and 0 otherwise. Real income is calculated by the 2006 consumer price index (CPI) from the Central Bank of Nicaragua. Standard deviation is omitted for dummy variables

Table 2: Test for equality of means for the pre-intervention variables

| | Before matching | | | After Matching | | |
|---|---|---|---|---|---|---|
| | Eligible | Non- Eligible | Difference | Eligible | Non- Eligible | Difference |
| Variables | (1) | (2) | (3) | (4) | (5) | (6) |
| *Panel A. Covariates* | | | | | | |
| Gender | 0.465 | 0.573 | −0.107*** | 0.460 | 0.467 | −0.007 |
| | (0.007) | (0.011) | (0.013) | (0.007) | (0.011) | (0.012) |
| Age | 39.358 | 38.242 | 1.117*** | 39.362 | 39.429 | −0.067 |
| | (0.161) | (0.247) | (0.292) | (0.163) | (0.243) | (0.271) |
| Household size | 5.133 | 5.248 | −0.115* | 5.140 | 5.133 | 0.007 |
| | (0.035) | (0.054) | (0.064) | (0.036) | (0.053) | (0.059) |
| Primary completed or less | 0.403 | 0.385 | 0.018 | 0.403 | 0.410 | −0.007 |
| | (0.007) | (0.010) | (0.013) | (0.007) | (0.011) | (0.012) |
| Secondary completed or less | 0.371 | 0.331 | 0.040*** | 0.373 | 0.373 | −0.000 |
| | (0.007) | (0.010) | (0.012) | (0.007) | (0.010) | (0.012) |
| Above secondary school | 0.238 | 0.247 | −0.009 | 0.237 | 0.231 | 0.006 |
| | (0.006) | (0.009) | (0.011) | (0.006) | (0.009) | (0.010) |
| Area of residency: urban | 0.770 | 0.740 | 0.030*** | 0.775 | 0.771 | 0.003 |
| | (0.006) | (0.009) | (0.011) | (0.006) | (0.009) | (0.010) |
| *Panel B. Pre-intervention outcome* | | | | | | |
| Real Income | 2,379.4 | 2,513.6 | −134.2** | 2,379.4 | 2,314.7 | 64.7 |
| | (35.08) | (58.97) | (65.63) | (35.08) | (55.73) | (60.17) |

Notes: This table presents descriptive statistics on the pre-intervention variables from 2009 LSMS. Columns (3) and (6) present the differences between the eligible and non-eligible groups. Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The matching estimator is full Mahalanobis using the 10 neighbours without a caliper.

Table 3: Test for parallel trends between 2005 and 2009

| | Dependent variable: Log of Real Income | | | | |
|---|---|---|---|---|---|
| Variables | (1) | (2) | (3) | (4) | (5) |
| Post × Eligibility | 0.249 | 0.193 | 0.171 | 0.221 | 0.032 |
| | (0.489) | (0.421) | (0.404) | (0.332) | (0.083) |
| Post | 0.107 | 0.029 | −0.033 | −0.073 | 0.021 |
| | (0.338) | (0.227) | (0.207) | (0.193) | (0.074) |
| Eligibility | −0.184 | −0.162 | −0.124 | −0.271 | −0.726*** |
| | (0.391) | (0.355) | (0.341) | (0.304) | (0.107) |
| Observations | 6524 | 6524 | 6409 | 6409 | 6409 |
| $R^2$ | 0.014 | 0.159 | 0.169 | 0.244 | 0.312 |
| Controls | No | Yes | Yes | Yes | Yes |
| Regional Fixed Effects | No | No | Yes | Yes | Yes |
| Occupation Fixed Effects | No | No | No | Yes | Yes |
| Letter-code Fixed Effects | No | No | No | No | Yes |

Notes: This table displays the OLS estimates for a matched sample. The matching estimator is full Mahalanobis with ten neighbours and no calliper. To test parallel trends, we only use the 2005 and 2009 samples. Post is a dummy variable equal to 1 if the year is 2009 and 0 if the year is 2005. Eligibility is a dummy variable that is set to 1 if a person is eligible for the SBFE programme and 0 otherwise. Gender, age, household size, years of education, and place of residence are all control factors. In addition, four regional fixed effects, nine occupation fixed effects, and eighteen letter-code fixed effects are controlled for. Robust standard errors clustered at eighteen letter-code activities by year are shown in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: Impact of SBFE programme on income

| | Dependent variable: Log of Real Income | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Overall | | | Females | | | Males | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Post × Eligibility | 0.103 | 0.151 | 0.063 | 0.115 | 0.099 | 0.075** | 0.041 | 0.085 | 0.028 |
| | (0.474) | (0.334) | (0.071) | (0.202) | (0.168) | (0.035) | (0.458) | (0.378) | (0.129) |
| Post | 0.072 | −0.083 | −0.058 | −0.146 | −0.144 | −0.116*** | 0.096 | 0.014 | 0.039 |
| | (0.408) | (0.220) | (0.045) | (0.172) | (0.127) | (0.020) | (0.298) | (0.129) | (0.056) |
| Eligibility | 0.032 | 0.027 | −0.708*** | 0.430*** | 0.418*** | −0.360 | −0.391 | −0.363* | −0.780*** |
| | (0.313) | (0.213) | (0.099) | (0.146) | (0.126) | (0.212) | (0.280) | (0.194) | (0.106) |
| Observations | 7010 | 7010 | 7010 | 3547 | 3547 | 3547 | 3463 | 3463 | 3463 |
| $R^2$ | 0.002 | 0.176 | 0.314 | 0.060 | 0.130 | 0.236 | 0.030 | 0.199 | 0.330 |
| Controls | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| Regional Fixed Effects | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| Occupation Fixed Effects | No | No | Yes | No | No | Yes | No | No | Yes |
| Letter-code Fixed Effects | No | No | Yes | No | No | Yes | No | No | Yes |

Notes: This table reports OLS estimates of a matched sample. The matching estimator is full Mahalanobis using the 10 neighbours without a calliper. Post is a dummy variable equal to 1 if year is 2014 and 0 if year is 2009. Eligibility is a dummy variable equal to 1 if individuals are eligible for the SBFE programme and 0 otherwise. Controls include gender, age, household size, years of education, and area of residence. In addition, four regional fixed effects, nine occupation fixed effects, and eighteen letter-code fixed effects are controlled for. Robust standard errors clustered at eighteen letter-code activities by year are shown in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5: Heterogeneous treatment effects by educational attainment

| | Dependent variable: Log of Real Income | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Primary completed Or less | | | Secondary completed Or less | | | Above secondary School | | |
| | Overall | Females | Males | Overall | Females | Males | Overall | Females | Males |
| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Post × Eligibility | 0.088 | 0.145*** | −0.037 | 0.152** | 0.183*** | 0.133 | 0.008 | −0.113 | 0.168 |
| | (0.088) | (0.040) | (0.149) | (0.066) | (0.033) | (0.099) | (0.046) | (0.072) | (0.101) |
| Post | −0.122** | −0.192*** | 0.007 | −0.105* | −0.176*** | −0.019 | −0.059* | −0.015 | −0.056 |
| | (0.047) | (0.015) | (0.064) | (0.056) | (0.032) | (0.089) | (0.030) | (0.057) | (0.074) |
| Eligibility | −0.719*** | −0.467*** | −0.744*** | −0.691*** | −0.287 | −0.748*** | −0.505*** | −0.955** | −0.550** |
| | (0.103) | (0.154) | (0.089) | (0.162) | (0.631) | (0.202) | (0.155) | (0.353) | (0.238) |
| Observations | 2786 | 1378 | 1403 | 2523 | 1329 | 1191 | 1682 | 932 | 747 |
| $R^2$ | 0.278 | 0.209 | 0.306 | 0.314 | 0.221 | 0.253 | 0.347 | 0.283 | 0.284 |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Regional Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Occupation Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Letter-code Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Notes: This table reports OLS estimates of a matched sample. The matching estimator is full Mahalanobis using the 10 neighbours without a caliper. Post is a dummy variable equal to 1 if year is 2014 and 0 if year is 2009. Eligibility is a dummy variable equal to 1 if individuals are eligible for the SBFE programme and 0 otherwise. Controls include gender, age, household size, years of education, and area of residence. In addition, four regional fixed effects, nine occupation fixed effects, and eighteen letter-code fixed effects are controlled for. Robust standard errors clustered at eighteen letter-code activities by year are shown in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6: Heterogeneous treatment effects by age category

| | Dependent variable: Log of Real Income | | | | | |
|---|---|---|---|---|---|---|
| | Below median age | | | Above median age | | |
| | Overall | Females | Males | Overall | Females | Males |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Post × Eligibility | 0.117 | 0.113*** | 0.131 | 0.014 | 0.034 | −0.095 |
| | (0.074) | (0.038) | (0.080) | (0.095) | (0.039) | (0.209) |
| Post | −0.128* | −0.230*** | −0.005 | 0.012 | 0.020 | 0.082 |
| | (0.066) | (0.028) | (0.062) | (0.042) | (0.033) | (0.085) |
| Eligibility | −0.611*** | −0.408 | −0.639*** | −0.791*** | −0.332** | −0.892*** |
| | (0.082) | (0.444) | (0.092) | (0.144) | (0.151) | (0.138) |
| Observations | 3649 | 1774 | 1874 | 3360 | 1768 | 1589 |
| R2 | 0.315 | 0.253 | 0.312 | 0.326 | 0.244 | 0.359 |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Regional Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Occupation Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Letter-code Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |

Notes: This table reports OLS estimates of a matched sample. The matching estimator is full Mahalanobis using the 10 neighbours without a caliper. Post is a dummy variable equal to 1 if year is 2014 and 0 if year is 2009. Eligibility is a dummy variable equal to 1 if individuals are eligible for the SBFE program and 0 otherwise. Controls include gender, age, household size, years of education, and area of residence, four regional fixed effects, nine occupation fixed effects, and eighteen letter-code activity fixed effects. Robust standard errors clustered at the year times eighteen letter-code activities are shown in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7: Falsification test on paid-employed workers between 2009 and 2014

| | Dependent variable: Log of Real Income | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Primary completed Or less | | | Secondary completed Or less | | | Above secondary School | | |
| | Overall | Females | Males | Overall | Females | Males | Overall | Females | Males |
| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Post × Eligibility | −0.063 | −0.137 | −0.020 | −0.030 | −0.076 | −0.001 | −0.013 | 0.015 | −0.030 |
| | (0.054) | (0.104) | (0.045) | (0.030) | (0.057) | (0.032) | (0.022) | (0.033) | (0.036) |
| Post | 0.234*** | 0.352*** | 0.186*** | 0.166*** | 0.201*** | 0.145*** | 0.109*** | 0.124*** | 0.093*** |
| | (0.039) | (0.081) | (0.035) | (0.023) | (0.043) | (0.025) | (0.020) | (0.024) | (0.027) |
| Eligibility | −0.022 | −0.015 | −0.036 | −0.046** | −0.063 | −0.058** | −0.047** | −0.105** | −0.022 |
| | (0.073) | (0.173) | (0.048) | (0.018) | (0.062) | (0.028) | (0.023) | (0.039) | (0.032) |
| Observations | 2885 | 665 | 2215 | 5419 | 1885 | 3534 | 6054 | 3010 | 3043 |
| $R^2$ | 0.267 | 0.421 | 0.242 | 0.249 | 0.259 | 0.210 | 0.339 | 0.370 | 0.298 |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Regional Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Occupation Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Letter-code Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Notes: This table reports OLS estimates of a matched sample. The matching estimator is full Mahalanobis using the ten neighbours without a caliper. We use the sample of paid-employed workers from 2009 and 2014 LSMS for the falsification test. Post is a dummy variable equal to 1 if year is 2014 and 0 if year is 2009. Eligibility is a dummy variable equal to 1 if individuals are eligible for the SBFE programme and 0 otherwise. Controls include gender, age, household size, education years, and residence area. In addition, four regional fixed effects, nine occupation fixed effects, and eighteen letter-code fixed effects are controlled for. Robust standard errors clustered at eighteen letter-code activities by year are shown in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

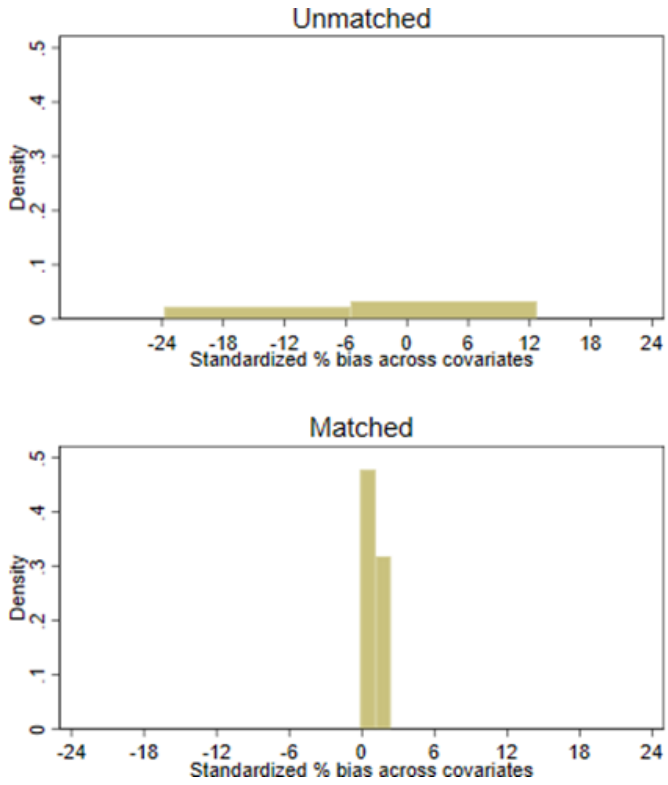
Table 8: Possible mechanism for the SBFE program impact

| | Dependent variable: | | |
|---|---|---|---|
| | Received Training | Months Worked | Probability of having a 2nd job |
| Variables | (1) | (2) | (3) |
| *Panel A. Overall* | | | |
| Post × Eligibility | 0.010 | 0.057 | 0.019 |
| | (0.006) | (0.243) | (0.026) |
| Post | 0.0067** | −0.359 | −0.000 |
| | (0.003) | (0.223) | (0.028) |
| Eligibility | −0.005 | −0.788** | 0.016 |
| | (0.005) | (0.288) | (0.028) |
| Mean dependent variable | 0.036 | 10.478 | 0.099 |
| *Panel B. Females* | | | |
| Post × Eligibility | 0.006 | 0.467*** | 0.054*** |
| | (0.009) | (0.147) | (0.018) |
| Post | 0.010* | −0.642*** | −0.039** |
| | (0.005) | (0.084) | (0.019) |
| Eligibility | −0.006 | −1.515** | 0.021 |
| | (0.028) | (0.574) | (0.040) |
| Mean dependent variable | 0.043 | 10.349 | 0.102 |
| *Panel C. Males* | | | |
| Post × Eligibility | 0.013** | −0.407 | −0.026 |
| | (0.006) | (0.289) | (0.021) |
| Post | 0.004 | 0.040 | 0.048** |
| | (0.004) | (0.285) | (0.021) |
| Eligibility | −0.004 | −0.681*** | 0.018 |
| | (0.004) | (0.233) | (0.024) |
| Mean dependent variable | 0.028 | 10.611 | 0.095 |
| Controls | Yes | Yes | Yes |
| Regional Fixed Effects | Yes | Yes | Yes |
| Occupation Fixed Effects | Yes | Yes | Yes |
| Letter-code Fixed Effects | Yes | Yes | Yes |

Notes: The OLS estimates for a matched sample are reported in this table. The matching estimator is full Mahalanobis with ten neighbours and no calliper. We use the 2009 and 2014 LSMS samples of self-employed workers. Post is a dummy variable that equals one if the year is 2014 and zero if the year is 2009. Eligibility is a dummy variable that is set to 1 if a person is eligible for the SBFE programme and 0 otherwise. Received training is a dummy variable that equals 1 if people said they received training and 0 otherwise. The probability of having a second job is a dummy variable equal to 1 if people said they have a second job and 0 otherwise. Controls include gender, age, household size, years of education, and area of residence, four regional fixed effects, nine occupation fixed effects, and eighteen letter-code fixed effects. Robust standard errors clustered at the year times eighteen letter-code activities are shown in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

## Appendix Figure

Figure A1: Bias correction



## Appendix Tables

Table A.1: CUAEN Codes and Eligibility Status, all years

| Letter-Codes | 3 Digits CUAEN Codes | Not eligible | Eligible | Total |
|---|---|---|---|---|
| A | 011 - Crops in general- cultivation of market products- horticulture | 0 | 1899 | 1899 |
| A | 012 - Animal husbandry | 102 | 0 | 102 |
| A | 013 - Growing of agricultural products in combination with animal husbandry (mixed farming) | 906 | 0 | 906 |
| A | 014 - Agricultural and livestock service activities, except veterinary activities | 0 | 61 | 61 |
| A | 020 - Forestry, Timber extraction and related service activities | 0 | 32 | 32 |
| B | 050 - Fishing, exploitation of fish hatcheries and fish farms- service activities related to fishing | 146 | 0 | 146 |
| C | 132 - Extraction of non-ferrous metalliferous minerals, except uranium and thorium ores | 34 | 0 | 34 |
| C | 141 - Extraction of stone, sand and clay | 4 | 0 | 4 |
| C | 142 - Exploitation of mines and quarries | 6 | 0 | 6 |
| D | 151 - Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats | 0 | 29 | 29 |
| D | 152 - Manufacture of dairy products | 0 | 46 | 46 |
| D | 153 - Production of mill products, starches and starch products, and prepared animal feeds | 0 | 296 | 296 |
| D | 154 - Manufacture of other food products | 0 | 182 | 182 |
| D | 155 - Preparation of beverages | 0 | 12 | 12 |
| D | 171 - Spinning, weaving and finishing of textile products | 0 | 3 | 3 |
| D | 172 - Manufacture of other textile products | 0 | 45 | 45 |
| D | 173 - Knitting and crochet knitting and knitting | 0 | 8 | 8 |
| D | 181 - Manufacture of clothing, except fur garments | 0 | 196 | 196 |
| D | 182 - Adobo and dyeing of skins- manufacture of leather goods | 0 | 2 | 2 |
| D | 191 - Tanning and dressing of leather- manufacture of suitcases, handbags and saddlery and saddlery articles | 0 | 5 | 5 |
| D | 192 - Manufacture of footwear | 0 | 12 | 12 |
| D | 201 - Sawing and planning of wood | 0 | 6 | 6 |
| D | 202 - Manufacture of products made of wood, cork, straw and plaiting materials | 0 | 53 | 53 |
| D | 210 - Manufacture of paper and paper products | 0 | 4 | 4 |

| | | | | |
|---|---|---|---|---|
| D | 221 - Publishing activities | 0 | 5 | 5 |
| D | 222 - Printing activities and related service activities | 0 | 3 | 3 |
| D | 242 - Manufacture of other chemical products | 2 | 0 | 2 |
| D | 261 - Manufacture of glass and glass products | 5 | 0 | 5 |
| D | 269 - Manufacture of non-metallic mineral products | 22 | 0 | 22 |
| D | 272 - Manufacture of primary products of precious metals and non-ferrous metals | 1 | 0 | 1 |
| D | 273 - Casting of metals | 1 | 0 | 1 |
| D | 281 - Manufacture of metal products for structural use, tanks, tanks and steam generators | 83 | 0 | 83 |
| D | 289 - Manufacture of other fabricated metal products- metalworking services activities | 18 | 0 | 18 |
| D | 291 - Manufacture of general-purpose machinery | 0 | 1 | 1 |
| D | 292 - Manufacture of special-purpose machinery | 0 | 1 | 1 |
| D | 323 - Manufacture of radio and television receivers, sound and video recording and reproducing apparatus, and related products | 0 | 1 | 1 |
| D | 331 - Manufacture of medical apparatus and instruments and apparatus for measuring, checking, testing, navigating and other purposes, except optical instruments | 0 | 2 | 2 |
| D | 343 - Manufacture of parts, accessories and parts for motor vehicles and their engines | 1 | 0 | 1 |
| D | 351 - Construction and repair of ships and other vessels | 1 | 0 | 1 |
| D | 359 - Manufacture of other types of transport equipment | 1 | 0 | 1 |
| D | 361 - Manufacture of furniture | 0 | 87 | 87 |
| D | 369 - Manufacturing industries | 0 | 51 | 51 |
| D | 371 - Recycling of metal waste and scrap | 0 | 1 | 1 |
| D | 372 - Recycling of non-metallic waste and scrap | 0 | 3 | 3 |
| F | 452 - Construction of complete buildings and parts of buildings- civil engineering works | 0 | 342 | 342 |
| F | 453 - Conditioning of buildings | 0 | 66 | 66 |
| F | 454 - Termination of buildings | 0 | 30 | 30 |
| G | 501 - Sale of motor vehicles | 0 | 5 | 5 |
| G | 502 - Maintenance and repair of motor vehicles | 0 | 142 | 142 |
| G | 503 - Sale of parts, accessories and parts of motor vehicles | 0 | 13 | 13 |

| | | | | |
|---|---|---|---|---|
| G | 504 - Sale, maintenance and repair of motorcycles and their parts, parts and accessories | 0 | 6 | 6 |
| G | 505 - Retail sale of automotive fuel | 0 | 7 | 7 |
| G | 506 - Sale, Maintenance and Repair of Human and Animal Traction Vehicles and their Parts, Parts and Accessories | 0 | 23 | 23 |
| G | 511 - Wholesale in exchange for a fee or contract | 0 | 6 | 6 |
| G | 512 - Wholesale of agricultural raw materials, live animals, food, beverages and tobacco | 0 | 80 | 80 |
| G | 513 - Wholesale of household goods | 0 | 8 | 8 |
| G | 514 - Wholesale of non-agricultural intermediate products, wastes and wastes | 0 | 60 | 60 |
| G | 519 - Wholesale of other products | 0 | 6 | 6 |
| G | 521 - Non-specialised retail trade in warehouses | 0 | 1078 | 1078 |
| G | 522 - Retail sale of food, beverages and tobacco in specialised stores | 0 | 336 | 336 |
| G | 523 - Retail trade of other new products in specialised stores | 0 | 310 | 310 |
| G | 524 - Retail sale in used goods stores | 0 | 81 | 81 |
| G | 525 - Retail trade not carried out in warehouses | 0 | 1387 | 1387 |
| G | 526 - Repair of personal effects and household goods | 0 | 202 | 202 |
| H | 551 - Hotels- camps and other types of temporary lodging | 0 | 5 | 5 |
| H | 552 - Restaurants, bars and canteens | 0 | 618 | 618 |
| I | 602 - Other types of land transport | 455 | 0 | 455 |
| I | 611 - Shipping and cabotage | 4 | 0 | 4 |
| I | 612 - Transport by inland waterways | 3 | 0 | 3 |
| I | 630 - Complementary and auxiliary transport activities- activities of travel agencies | 26 | 0 | 26 |
| I | 641 - Postal and mail activities | 2 | 0 | 2 |
| I | 642 - Telecommunications | 7 | 0 | 7 |
| J | 659 - Other types of financial intermediation | 6 | 0 | 6 |
| J | 671 - Activities auxiliary to financial intermediation, except for the financing of insurance and pension plans | 10 | 0 | 10 |
| K | 701 - Real estate activities carried out with own or leased property | 9 | 0 | 9 |
| K | 702 - Real estate activities performed in exchange for a Remuneration or contract | 1 | 0 | 1 |

| | | | | |
|---|---|---|---|---|
| K | 711 - Rental of transport equipment | 5 | 0 | 5 |
| K | 713 - Rental of personal effects and household goods | 10 | 0 | 10 |
| K | 721 - Computer equipment consultants | 2 | 0 | 2 |
| K | 722 - Consultants in computer programmes and supply of computer programmes | 2 | 0 | 2 |
| K | 723 - Data processing | 8 | 0 | 8 |
| K | 724 - Activities related to databases | 1 | 0 | 1 |
| K | 725 - Maintenance and repair of office, accounting, and computer machinery | 17 | 0 | 17 |
| K | 729 - Other computer activities | 1 | 0 | 1 |
| K | 741 - Legal and accounting activities, bookkeeping, and auditing- tax advice- market research and conducting public opinion surveys- business and management advice | 116 | 0 | 116 |
| K | 742 - Architectural and engineering activities and other technical activities | 11 | 0 | 11 |
| K | 743 - Advertising | 11 | 0 | 11 |
| K | 749 - Business activities | 60 | 0 | 60 |
| L | 751 - Administration of the State and application of the economic and social policy of the community | 0 | 0 | 0 |
| M | 801 - Primary education | 8 | 0 | 8 |
| M | 802 - Secondary education | 2 | 0 | 2 |
| M | 803 - Higher education | 1 | 0 | 1 |
| M | 809 - Adult education and other types of education | 29 | 0 | 29 |
| N | 851 - Activities related to human health | 39 | 0 | 39 |
| N | 852 - Veterinary activities | 5 | 0 | 5 |
| N | 853 - Social service activities | 7 | 0 | 7 |
| O | 900 - Disposal of waste and sewage, sanitation, and similar activities | 0 | 0 | 0 |
| O | 919 - Activities of other associations | 0 | 0 | 0 |
| O | 921 - Motion picture, radio and television activities and other entertainment activities | 53 | 0 | 53 |
| O | 924 - Sports activities and other recreational activities | 18 | 0 | 18 |
| O | 930 - Other activities | 1138 | 0 | 1138 |
| P | 950 - Private households with domestic service | 0 | 0 | 0 |
| P | 960 - Activities related to the production of goods from private households for self-consumption. | 0 | 0 | 0 |

| | | | | |
|---|---|---|---|---|
| Z | 990 - Other unspecified activities | 0 | 0 | 0 |
| Total | | 3400 | 7857 | 11257 |

*Notes*: The letter codes are the following: A-agriculture, livestock, hunting and forestry; B-fishing; C-mining and quarry exploitation; D-manufacturing industries; E-supply of electricity, gas and water; F-construction; G-wholesale and retail trade, repair of motor vehicles, motorcycles, personal effects and domestic facilities; H-hotels and restaurants; I-transportation, storage and communications; J-financial intermediation; K-real estate, business and rental activities; L-public administration and defence, social security plans of compulsory affiliation; M-teaching; N-social and health service; O-other activities of community, social and personal services; P-private homes with domestic service; Z-other activities not specified.

Table A2: Test for parallel trends by gender

| | Dependent variable: Log of Real Income | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Overall | | | Females | | | Males | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Post × Eligibility | 0.249 | 0.171 | 0.032 | −0.108 | −0.126 | −0.044 | 0.351 | 0.283 | 0.102 |
| | (0.494) | (0.404) | (0.083) | (0.218) | (0.207) | (0.084) | (0.408) | (0.285) | (0.077) |
| Post | 0.107 | −0.033 | 0.021 | 0.320** | 0.220 | 0.148* | 0.126 | −0.155 | −0.082 |
| | (0.338) | (0.207) | (0.074) | (0.141) | (0.129) | (0.084) | (0.317) | (0.120) | (0.050) |
| Eligibility | −0.184 | −0.124 | −0.726*** | 0.541*** | 0.531*** | −0.327 | −0.679** | −0.598** | −0.795*** |
| | (0.391) | (0.341) | (0.107) | (0.167) | (0.167) | (0.272) | (0.298) | (0.215) | (0.067) |
| Observations | 6524 | 6409 | 6409 | 2845 | 2806 | 2805 | 3679 | 3603 | 3603 |
| R2 | 0.014 | 0.169 | 0.312 | 0.071 | 0.140 | 0.238 | 0.063 | 0.228 | 0.342 |
| Controls | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| Regional Fixed Effects | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| Occupation Fixed Effects | No | No | Yes | No | No | Yes | No | No | Yes |
| Letter-code Fixed Effects | No | No | Yes | No | No | Yes | No | No | Yes |

Notes: This table displays the OLS estimates for a matched sample. The matching estimator is full Mahalanobis with ten neighbours and no calliper. Post is a dummy variable that equals one if the year is 2009 and zero if the year is 2005. Eligibility is a dummy variable that is set to 1 if a person is eligible for the SBFE programme and 0 otherwise. Gender, age, household size, years of education, and place of residence are all factors to consider. There are also four regional fixed effects, nine occupation fixed effects, and eighteen letter-code activity fixed effects to account for. Robust standard errors clustered at eighteen letter-code activities by year are shown in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.