DOES THE SMALL BUSINESS PROGRAM BENEFIT SELF-EMPLOYED WORKERS? EVIDENCE FROM NICARAGUA

By

RODRIGUEZ RAMIREZ , Rony Rodrigo Maximiliano

THESIS

Submitted to

KDI School of Public Policy and Management

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For the Degree of

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ABSTRACT

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

By

Rony Rodrigo Maximiliano Rodriguez Ramirez

Do social programs lead to higher incomes for self-employed workers? In many Latin American countries, governments have been implementing a diverse set of social programs to improve the living standards of the target groups. I study the policy shift of the current Government of Nicaragua that started in 2012 towards self-employed workers with the implementation of the Small Business of the Family Economy (SBFE) program of the Ministry of Family Economy, Community, Cooperative, and Associative. This paper aims to quantify the impact of the SBFE program on self-employed workers' income. I use data from the Living Standards Measurement Survey (LSMS) implemented by the National Institute of Development Information of Nicaragua. The results suggest that the program has a positive effect on the income of self-employed workers. Specially, those with low educational attainment and in manufacturing, hotels and restaurants sectors are more likely to benefit from the program. In terms of gender, females seem to benefit more than males from the program implementation.

JEL Codes: J08, M54, 017.

Keywords: Nicaragua, self-employed, social programs.

To Mom and Dad.

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INTRODUCTION

Do social programs lead to higher incomes for individuals? Although there is still little consensus on the answers to this question, estimating the causal impact of social programs become important not only for public expending but also for the overall wellbeing and of workers with fewer opportunities.[1] In many Latin American countries, governments have been implementing a diverse set of social programs to improve the living standards of the targeted groups. From Conditional Cash Transfers (CCT), food stamps, price subsidies to labor empowerment and inclusive training programs, governments aim to develop new programs to combat poverty and improve the living standards (Karlan & Appel, 2012).

Notably, in developing countries, self-employment is vastly common, and it accounts for a considerable portion of their labor force (Fields, 2014; Gindling & Newhouse, 2014). Self-employed workers are often considered the predominant mode of economic activity in developing countries whose status is a response to the local labor market situation (Fields, 2014). Whether they are rationed out of the labor market or simply because they lack the skills to be part of the labor market, the characteristics of the self-employed workers are subject to discuss from different perspectives. Self-employment is also commonly addressed as part of the informal economy (Fields, 2014). In the same line, Castells and Portes (1989) stated that informal employment had been defined as the sum of self-employed workers, domestic workers, and unremunerated family workers. However, equating informality to self-employment could be unhelpful because the terminology differs in nature and they might mean different things to differ-

[1] See for example Cho and Honorati (2013), for studies in the entrepreneurship literature in developing countries.

ent people (Fields, 2014). Although there is vast literature regarding the role of self-employed workers in developing countries, there is still unknown characteristics that are necessary to be studied (Gindling & Newhouse, 2014).

Self-employed workers can be categorized into three groups: (1) entrepreneurs who are innovative with further growth potential and with different set of ambitious goals (de Soto, 1989); (2) workers that earn little because they are rationed out of wage jobs in the formal labor market and with less likelihood to become employers (Castells & Portes, 1989; Tokman, 1978); and (3) volunteers workers that prefer to have greater independence and flexibility (Maloney, 1998, 2004; Chen, 2012). The self-employed sector in the Latin American region is a special case where these three categories can be integrated (Funkhouser, 1997). Additionally, to this discussion, Funkhouser (1996) found that for the Central America region, there is an interesting pattern of higher returns to experience and education in the informal sector in contrast to the formal which could indicate preferences for the sector.[2] However, at the same time the level of informality is inversely proportional to the level of development in these countries. According to Funkhouser (1996), the sector comprises individuals with low educational levels, females, the youngest and the oldest.

In line with the heterogeneous scenario of the self-employed workers in developing countries, Maloney (1998) expressed that labor mobility between formal and informal sector was relatively higher for highly educated males. This implies a non-mutually exclusive relationship between formal sector and informal sector. The self-employed workers behave in a pro-cyclical manner and because of the low-productivity characteristic of the formal work in developing countries; self-employment constitutes a desirable alternative combined with formal salaried employment.[3] The self-employment sector may, therefore, rep-

[2]The higher returns to experience in the informal sector is not only addressed in the study of Funkhouser (1996). Telles (1993) found higher return for males and females self-employed workers in Brazil and Mohan (1986) found a similar pattern for self-employed male workers in Colombia.

[3]For example, Galli and Kucera (2003) identified that 70 percent of the self-employed workers moved voluntarily to this sector. Additionally, Svaleryd (2015) studied the important of the

resent an efficient allocation of labor in developing countries (Maloney, 1998). These studies suggest that there is little reason to choose only one approach to understand the self-employed workers in the labor market. Given the conflicting evidence about the nature of the self-employed workers, the discussion has turned into those successful workers and those unsuccessful workers considering their growth potential characteristic (Gindling & Newhouse, 2014). Nurturing the development of those successful workers becomes essential and identifying in which settings the self-employed workers benefit the most are still two important policy objectives to combat poverty in developing countries. Nevertheless, there is still no consensus about which policy the government should prioritize to increase the self-employed workers' wellbeing.

Regarding social programs towards the self-employed workers little is known. The literature has been mainly focused on self-employed workers' job satisfaction in comparison to salaried workers (Cueto & Pruneda, 2017) or the returns to education of self-employed workers (García-Mainar & Montuenga-Gómez, 2005). The type of intervention such as promoting entrepreneurial activities, business set-up, and technical, business and financial training, and the group target matter significantly for the success or failure of each designed program (Cho & Honorati, 2013). Overall, because the relatively small number of programs that target only self-employed workers, the empirical evidence on their effectiveness is still scarce. Moreover, the existing impact evaluations of interventions are extensively heterogenous (Cho & Honorati, 2013).

I study the implementation of the Small Business of the Family Economy (SBFE) program which primary objective is to improve the capabilities of self-employed workers through training, information, and development of skills in the sectors of Agriculture, Forestry, Manufacturing, Commerce and Services, and Construction in Nicaragua. This paper aims to quantify the impact of this program on self-employed workers' incomes. I use data from the Living Stan-

local business cycle for self-employed workers arguing that they respond differently depending on how the business cycle affects them; thus, finding heterogeneous responses across groups.

dards Measurement Survey (LSMS) implemented by the National Institute of Development Information of Nicaragua (INIDE, by its acronym in Spanish) to perform an intention-to-treat analysis on the program relying on a difference-in-differences specification to exploit the timing of the introduction and the group exposure variation to the program. To the best of my knowledge, this is the first study that estimates the impact of the current programs implemented by the Government of Nicaragua.

I find that the introduction ofhe SBFE program has a positive impact on self-employed workers by increasing their income by 21 percent. This increase comes mainly from low educated self-employed wokring in working in the manufacturing, hotels and restaurants sectors. In terms of gender, for females, the SBFE program seems to have a slightly higher impact than males. This paper contributes to the impact evaluation literature of social programs for the self-employed workers in developing countries.

The remainder of this paper is organized as follows. Section 2 describes the SBFE program and policy background. In Section 3, I describe the data used in this paper and its limitations. Section 4 presents the definition of the eligibility status, the empirical strategy and the estimated impact of the program on income. Section 5 turns to a heterogeneity and sector decomposition analysis and the robustness checks. Finally, section 6 offers the concluding remarks.

THE PROGRAM

In 2012, the Government of Nicaragua created the Ministry of Family Economy, Community, Cooperative, and Associative (Ministerio de Economía Familiar, Comunitaria, Cooperativa, y Asociativa, MEFCCA by its acronym in Spanish). The main objective of the MEFCCA is to preserve, promote and develop the initiative, hard work, dynamism and entrepreneurship that Nicaraguans have in individual, family and community work. The creation of this ministry serves as a shift towards the inclusion of self-employed individuals into the social programs implemented by the Government. Currently, the Government of Nicaragua executes more than 40 social programs in different areas. The MEFCCA is part of a new model of integral attention to the micro and small rural and urban production, recognizing the diverse capacities of the Nicaraguan families and various forms of participation in the national economy. Through agriculture, agri-business, handicrafts, trade, and services, from cooperatives, savings and informal associations, which, together, are part of the family and community economy, the MEFCCA develops different lines of work.

The MEFCCA through the Direction of Aggregation of Value and Transformation of the Products of the Family Economy has proposed among its lines of work the strengthening and implementation of small business strategies for the family economy. The MEFCCA's development approach focuses on strengthening short marketing chains at community, municipal and national levels, supporting participatory innovation and technology access to family businesses to improve their productivity and food safety. The objective of the MEFCCA is to promote and support small and medium businesses and the commercialization

of their products in different spaces such as the National Fair Park, Tiangues, and others. Within this objective, the MEFCCA also promote the creation of knowledge to improve the quality and productivity of small and medium-sized businesses. The different set of social programs that are implemented by the MEFCCA mostly target the self-employed workers in the urban and rural area of Nicaragua. At the same time, it provides tourism services that promote culture, identity, craftsmanship, safety, and gastronomy of the self-employed workers. Moreover, the MEFCCA facilitates the link of peasant production, individual or cooperative, with local purchases for different government programs.

The Small Businesses of the Family Economy program (hereinafter, SBFE), formerly known as the "Micro, Pequeña y Mediana Empresa" program[4] is implemented by the MEFCCA and the National Institute of Technology (Instituto Nacional de Tecnología, INATEC by its acronym in Spanish) since 2012. The SBFE program was designed to target individuals who want to develop or start their own business. It aims to bring training to the protagonists of Small and Medium-sized Enterprises (SMEs) in the productive sectors of (1) Trade and Service, (2) Agriculture and Forestry, and (3) Industry and Construction. The SBFE program objective is to improve and strengthen the capabilities of self-employed workers through training and creation of sustainable businesses. The program requires the following documentation; (1) copy of birth certificate or identification card; (2) copy of the last academic grades or constant that the individual can read and write; (3) 14 years old or older for the training in the commerce and service sector; (4) 16 years old or older for the training in the industry and construction sector, and finally; (5) the individual should desire to be trained. Self-employed workers who want to be part of the program fill a form at the MEFCCA and, 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.

[4]Micro, Small, Medium Enterprises in English.

The MEFCCA through the Small Business Training Directorate coordinates the SBFE program which oversees the development of training programs for small and medium-sized businesses together with INATEC. The program implements capacity-building programs with gender practices that promote the quality, productivity and efficiency of small businesses and design booklets for the small business establishment and strengthening of existing ones. It also encourages different marketing mechanisms of small businesses through national, municipal and regional fairs. The program works together with the Promotion and Commercialization of the Small and Medium Directorate of the MEFCCA to promote the development of small businesses at a national level. It emphasizes the rescue of traditional skills of business as the promotion of culture and local identity and accompanies young people and women in the establishment and strengthening of small and medium businesses. The program facilitates spaces for commercial exchanges of products and services (e.g., Fairs of the Family Economy) in order to promote small and medium business at the local and municipal level.

Furthermore, the SBFE program implements four types of training: (1) creation of business plans; (2) talks about business organization; (3) networking and establishment of virtual stores and access to new markets; and (4) administrative and productive techniques. There are two modalities in which the trainers from the MEFCCA and the INATEC carry out the program. First, 100 hours of training for three months, and, second, strengthening talks that are conducted in one day for four hours. In both types of modalities, the program is adjusted to the demand by the self-employed workers, and there is no limit for re-application of the training. The SBFE program ensures that all the participants create business development plans to marketize their small and medium business. The program also facilitates registration and update of small businesses through the information system established by the MEFCCA. This aims to improve the corporate image of small and medium businesses.

DATA

I examine the impact of the SBFE program by testing whether it affects the self-employed workers' income. I use data from the Living Standards Measurement Survey (LSMS) implemented by the National Institute of Development Information of Nicaragua (INIDE, by its acronym in Spanish) and it is supervised by the World Bank and United Nations Development Programme. I take the 2009 and 2014 waves which serve as pre-introduction and post-introduction of the SBFE program.[5] The LSMS is a national survey of urban and rural national representation. The sample is estimated using a two-stage probabilistic design per area and the total sample size comprised 7,520 and 7,570 households, in 2009 and 2014 respectively. For the data collection, the country was divided into census segments, each containing approximately 150 households in the urban area and 120 households in the rural area.[6] The core objective of the LSMS is to obtain the necessary information for the elaboration of the consumption aggregate, which, as a welfare measure, allows the construction of poverty lines for the classification of households according to their poverty condition. The LSMS is not largely concerned with self-employment status in Nicaragua but offers employment status indicators and economic activity for individuals.

The LSMS is based on the study of the levels of expenditure and consump-

[5] In a falsification test exercise, I use the 2005 and 2009 waves as pre-treatment and post-treatment periods. I expect no significant impact of the program on the self-employed workers' income for these periods. In the case of the 2005 wave, the sample size was 7,871 households. I restricted the sample to only self-employed individuals. The total number of self-employed workers in 2005 was 4,760.

[6] The observation units are all the households of the selected dwellings in the sample, where the technique of direct interview with suitable informants is applied previously identifying a main informant who can answer for the other members of the household. The divisions of the areas that have partitioned the country is based on the cartographic update carried out in 2004 by INIDE, which was used for the 2005 Nicaraguan Population and Housing Census.

tion of households, access to basic services and other variables related to the characteristics and life conditions. For this paper, I focus only on those people who are 14 years older and above which is the legal working age in Nicaragua and the minimum required age to be subject of the SBFE program. I classify each individual in the sample into their employment status using the LSMS questionnaire. A self-employed individual, therefore, is identified as an individual who recognized himself/herself as a self-employed, whose primary activity during the previous week of the survey interview is as a self-employed worker and does not hire any workers. I did not consider workers that have a second or third work as a self-employed worker, and I excluded unpaid family workers. The analytical sample consists of 8,045 self-employed individuals.[7] Additionally, I construct a primary activity variable which contains information of the economic activity of each individual using the Uniform Classifier of the Economic Activities of Nicaragua (CUAEN, by its acronym in Spanish). The primary activity variable categorized eighteen different important economic activities in Nicaragua. I use this variable to create an eligibility measure that is discussed in section 4.

The LSMS dataset contains income information for each individual. Given that the estimated income in the LSMS is in nominal terms, I use the Consumer Price Index (CPI) from the Central Bank of Nicaragua (BCN by its acronym in Spanish) to construct the real income of the self-employed workers. I report all monetary estimation in this paper in 2006 real Nicaraguan córdobas. Table A1 in the Appendix presents the summary statistics for several key variables in the analysis. On average the self-employed workers in the sample are males (50.4 percent), with 6.4 years of education, living in the urban area (76 percent), relatively old (42.4 years old), and with a household size on average of 5 people. Additionally, I present in Table A2 (See Appendix) the summary statistics for sex and education divided the sample into five primary economic activities.[8]

[7] I also implement a placebo test using only paid employees instead of self-employed workers and the 2009 and 2014 waves. I also expect no significant impact of the program on paid employees' income for these periods. This subsample consists of 16,511 individuals.

[8] The primary economic activities are: (1) Agriculture, Livestock, Hunting and Forestry, (2)

Overall, females represent more than 90 percent in Hotels and Restaurants and 62 percent in Commerce. In contrast, males made up more than 90 percent in Agriculture, Livestock, Hunting and Forestry, and in Construction. Regarding education, the most-educated individuals are present in the Commerce sector.

The data have some weaknesses that are necessary to point out: (a) the lack of information on the firm or work management of the self-employed workers; (b) the total amount of training hours that the self-employed worker has had; and (c) the type of training from the SBFE program received by the self-employed worker. Given these limitations, I use only the log of real income as my main outcome variable of interest which gives an approximation of the general well-being of the self-employed workers on an Intention-to-Treat framework. Additionally, I assume that all the eligible individuals that are possible to identify in the LSMS can take part in the SBFE program.

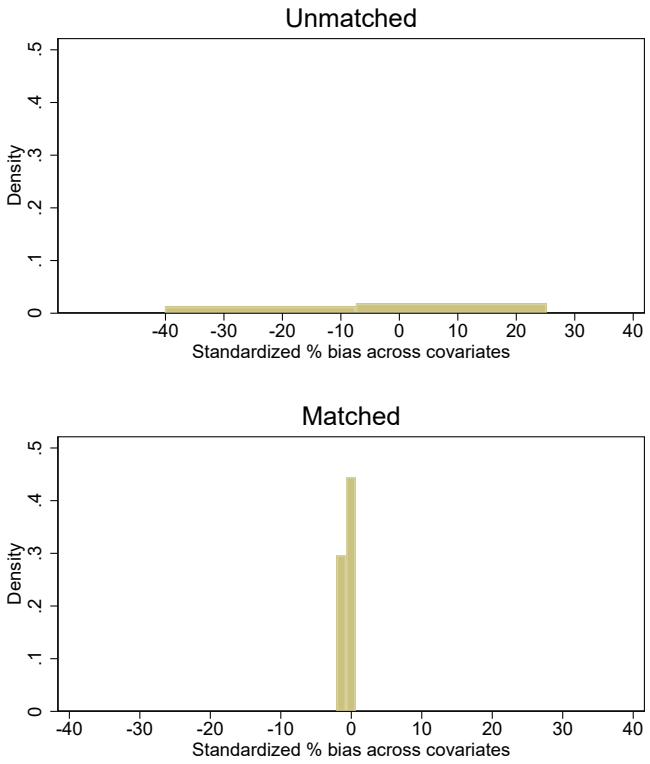
In order to address differences between non-eligible and eligible individuals, I use a propensity score matching (PSM) methodology which was constructed using single nearest neighbour imposing common support.[9] The PSM estimator contains two identifying assumptions. The first assumption is *unconfoundedness* which implies that the differences outcomes between treatment and control group are attributed to the treatment which is written as: $(Y_1, Y_0) \perp D|\mathbf{X}$, where Y_1 and Y_0 are potential outcomes for each individual i. D is the assignment variable and $\mathbf{X}$ are the covariates. This implies that the selection into treatment is based only on observable factors (Caliendo & Kopeinig, 2008). The second assumption is *overlap*, or *common support* which can be expressed as $0 < P(D = 1|\mathbf{X}) < 1$. The overlap assumption ensures that all the individuals that have same values of X can be participants of the program (Heckman, LaLonde, & Smith, 1999). Because eligible and non-eligible individuals differ in terms of covariates, I balance the distribution of their observable characteris-

Manufacturing Industry, (3) Construction, (4) Commerce, and (5) Hotels and Restaurants.

[9]Using different matching algorithms, such as radius or kernel, does not significantly change the main results presented in this paper.

tics using the PSM. I plot the bias correction in Figure 3.1 using the standardized percent of bias across covariates (Caliendo & Kopeinig, 2008). The bias correction can be illustrated using a histogram of the standardized % bias across covariates. After the PSM is estimated the standardized bias across covariates are within zero percent in contrast to the unmatched sample. Therefore, all the following estimations presented in the next sections are based on the matched sample.[10]

Figure 3.1: Bias Histogram between Unmatched and Matched Observations



Notes: Histogram for the standardized percent bias across covariates for the treatment status. The matching estimator is single nearest-neighbour within a caliper of 0.00001 imposing common support.

[10] In Table A3, I present a test of equality of means for key variables which contains the summary statistics of eligible and non-eligible individuals and their differences before and after matching.

EMPIRICAL STRATEGY

In this Section, I define the eligibility status for the self-employed workers, present the empirical strategy, and discuss the main results.

4.1 Eligibility Status

The eligibility status variable was constructed using the information of the LSMS dataset. The LSMS questionnaire contains the following question: What is the main economic activity of your occupation or the place you work at? I code this question using the "Uniform Classifier of the Economic Activities of Nicaragua" (CUAEN) to obtain a total of 18 primary economic activities.[11] Within the main CUAEN classification, I separate agriculture and forestry sector from livestock and hunting sector given that the former sector is eligible for the SBFE and the latter is not. Moreover, I separate manufacturing industries that are not eligible for the SBFE program such as the manufacture of chemicals. I classify each individual who reports to be self-employed into eligible sectors if they belong to the following economic sectors: (1) Agriculture and Forestry; (2) Manufacturing; (3) Construction; (4) Commerce; and (5) Hotels and Restaurants. The remaining individuals' economic activities serve as the comparison group, i.e., the non-eligible primary activities. Given the definition of the eligibility status presented above, I cannot identify directly whether the individual was treated or not

[11] The eighteen primary activities 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, (h) hotels and restaurants, (i) transportation, storage and communications, (j) financial intermediation, (k) real estate, business and rental activities, (l) public administration and defense, (m) teaching, (n) social and health services, (o) other activities of community, social and personal services, (p) private homes with domestic service, (q) extraterritorial organizations, (z) other activities.

by the SBFE program. The analysis, therefore, can be interpreted as Intention-to-Treat (ITT) analysis which ignores non-compliance, withdrawal, and protocol deviation of the individuals (Gupta, 2011).

4.2 Empirical Strategy

The empirical strategy follows a standard Difference-in-Differences (DID) strategy. I compare the relative impact on income in the post-introduction period of the program for those people who are self-employed workers and are in the eligible group relative to the pre-introduction exposure and self-employed workers that are not eligible for the SBFE program. The baseline estimating equation is:

$$Y_{it} = \alpha + \beta Post_t + \gamma Eligibility_i + \delta(Eligibility_i \times Post_t) + \mathbf{X}'_{it}\eta + \varepsilon_{it}, \quad (4.1)$$

where Y_{it} is the outcome variable for the individual i, which is the logarithm of the real income; $Eligibility_i$ is a dummy variable that takes the value of 1 if the individual i is in the eligible primary activity of the SBFE program and 0, otherwise; $Post_t$ is another dummy variable that takes the value of 1 if the period is 2014 and 0 if the period is 2009; δ represents the effect of the program given the interaction between $Post$ and $Eligibility$; $\mathbf{X}'_{it}$ is a vector of individuals characteristics that affect income; and ε_{it} is the error term clustered at the year times eighteen primary activity categories.

Equation (4.1) can also be modified to incorporate a different set of fixed effects. This suggest running the following regression:

$$\begin{aligned} Y_{it} = \alpha + \beta Post_t + \gamma Eligibility_i + \delta(Post_i \times Eligiblity_t) \\ + \mathbf{X}'_{it}\eta + \phi_r + \pi_o + \tau_p + \varepsilon_{it}, \end{aligned} \quad (4.2)$$

where the new modifications are; ϕ_r, which are regional fixed effects that ab-

sorb geographically restricted shocks affecting the real income of self-employed workers; π_o which are occupational fixed effects; and τ_p which are primary activity fixed effects that absorb economic sector non-observable characteristics. The Difference-in-Differences approach used in this paper requires the identifying assumption that in absence of the SBFE program, the eligible group would have change similar as the noneligible group (i.e., the parallel trend assumption). The DID can be interpreted as casual effect of the program, under the assumption that in the absence of the program, the increase in real income would not have been systematically different in eligible and noneligible individuals. The validity of this assumption is tested in section 4.3 where I estimate a falsification test using the 2005 and 2009 LSMS samples and a placebo test using only paid employed workers.

4.3 Falsification Test and Placebo Test

In this section, I test the validity of the parallel trend assumption of the DID model. Using the 2005 and 2009 LSMS samples, I run a falsification test using equation (4.2) which takes the 2005 year as pre-introduction of the SBFE program, and 2009 as a post-introduction of the program. I expect the interaction between Post and Eligibility to be not significantly different from zero given that the SBFE was introduced until 2012 with the introduction of the MEFCCA. The estimates of the falsification test are presented in Table 4.1. Column (1) reports estimates with primary activity fixed effects only. In the Column (2), I include individual controls. Column (3) comprises regional fixed effects that capture the importance of geographical differences for the real income. Column (4) shows the estimate when I control by occupation fixed effects. Overall, in all the specifications, the estimates are not statistically significant and including a different set of controls do not have a meaningful effect on the estimates.

Table 4.1: Falsification Test - Using 2005 and 2009 samples

	Dependent variable: Log of Real Income			
Variables	(1)	(2)	(3)	(4)
Post	.343	.352	.250	.253
	(.315)	(.266)	(.265)	(.263)
Eligibility	-.295	-.267	-.316	-.392
	(.319)	(.305)	(.299)	(.275)
Post × Eligibility	-.226	-.254	-.213	-.164
	(.256)	(.239)	(.223)	(.206)
Individual Controls	No	Yes	Yes	Yes
Regional Fixed Effects	No	No	Yes	Yes
Occupation Fixed Effects	No	No	No	Yes
Primary Activity Fixed Effects	Yes	Yes	Yes	Yes
R-squared	.148	.199	.205	.230
Observations	1,364	1,364	1,356	1,356

Notes: The table reports OLS estimates of a matched sample. The matching estimator is single nearest-neighbor within a caliper of 0.00001 imposing common support. Standard errors clustered at year times primary activity level are shown in parentheses. The pre-introduction period is 2005 and the post-introduction period is 2009. The unit of observation is an individual. The individual controls are sex, area of residence, years of education, age, household size, four regional fixed effects, eighteen primary activity fixed effects, and nine occupation fixed effects. Statistical significance at the 1, 5, 10% levels are indicated by ***,**, and *, respectively.

Now, I turn to a placebo test. I estimate equation (4.2) using only paid-employed workers who are not eligible for the SBFE program. The empirical strategy is the same as before, but I use the 2009 and 2014 LSMS surveys as a pre and post-introduction of the SBFE program, respectively. I expect the estimates to be not statistically significant as well. Table 2 shows that the employed workers are not affected by the interaction between Post and Eligible. I include a different set of fixed effects and individual controls. In all the specifications, the estimates are negative but statistically insignificant. As in the falsification test, the inclusion of controls and fixed effects do not have any impact on the real income of paid-employed workers. These results give confidence to the robustness of the parallel trend assumption of the DID model in this study.

Table 4.2: Placebo Test - Using only paid employed workers

	Dependent variable: Log of Real Income			
Variables	(1)	(2)	(3)	(4)
Post	.509	.377	.471	.297
	(.423)	(.308)	(.409)	(.370)
Eligibility	.491	.376	.306	.308
	(.305)	(.252)	(.263)	(.211)
Post × Eligibility	-.165	-.096	-.138	-.077
	(.493)	(.381)	(.497)	(.503)
Individual Controls	No	Yes	Yes	Yes
Regional Fixed Effects	No	No	Yes	Yes
Occupation Fixed Effects	No	No	No	Yes
Primary Activity Fixed Effects	Yes	Yes	Yes	Yes
R-squared	.202	.326	.365	.501
Observations	154	154	154	154

Notes: The table reports OLS estimates of a matched sample. The matching estimator is single nearest-neighbour within a caliper of 0.00001 imposing common support. Standard errors clustered at year times primary activity level are shown in parentheses. The pre-introduction period is 2009 and the post-introduction period is 2014. The unit of observation is an individual. The individual controls are sex, area of residence, years of education, age, household size, four regional fixed effects, eighteen primary activity fixed effects, and nine occupation fixed effects. Statistical significance at the 1, 5, 10% levels are indicated by ***,**, and *, respectively.

4.4 Estimating the Effect of SBFE on Income

The SFE program aims to improve the capabilities of self-employed with the objective to raise their levels of wellbeing. Through the strengthening of their skills, it is expected a rise in the income observed. I now turn to the estimates from my main estimating equation (4.2). I use the same empirical strategy to look at the self-employed workers' income. Table 4.3 presents my primary regression estimates, where standard errors are clustered at the year times primary activity level. I use the 2009 and 2014 LSMS datasets as pre and post-introduction of the SBFE program. The dependent variable is the log of real income for self-employed workers. The first column estimates the impact of the SBFE program on self-employed workers' real income including using primary activity fixed effects without additional controls. The estimate suggests that the introduction of the SBFE has a positive impact on the self-employed workers increasing their income by 21 percent. The coefficients are robust to the addition of other additional controls such as individual controls, regional and occupa-

tion fixed effects. This estimate is higher than those reported in similar social programs.[12]

Table 4.3: Impact of the Program on Real Income of the Self-Employed

	Dependent variable: Log of Real Income			
Variables	(1)	(2)	(3)	(4)
Post	-.134	-.162*	-.133*	-.115*
	(.079)	(.079)	(.076)	(.065)
Eligibility	-.611***	-.436***	-.409***	-.481***
	(.148)	(.104)	(.107)	(.097)
Post × Eligibility	.213**	0.218**	0.231**	0.213**
	(.090)	(.089)	(.092)	(.078)
Individual Controls	No	Yes	Yes	Yes
Regional Fixed Effects	No	No	Yes	Yes
Occupation Fixed Effects	No	No	No	Yes
Primary Activity Fixed Effects	Yes	Yes	Yes	Yes
R-squared	.222	.272	.280	.313
Observations	3,082	3,082	3,082	3,082

Notes: The table reports OLS estimates of a matched sample. The matching estimator is single nearest-neighbour within a caliper of 0.00001 imposing common support. Standard errors clustered at year times primary activity level are shown in parentheses. The pre-introduction period is 2009 and the post-introduction period is 2014. The unit of observation is an individual. The individual controls are sex, area of residence, years of education, age, household size, four regional fixed effects, eighteen primary activity fixed effects, and nine occupation fixed effects. Statistical significance at the 1, 5, 10% levels are indicated by ***,**, and *, respectively.

[12] Cho and Honorati (2013) discussed different set of entrepreneurship programs using a meta-analysis. They found that on average the positive impact of programs is a 14.7 percent increase in the participant's income.

HETEROGENEITY AND SECTOR DECOMPOSITION ANALYSIS

In this section, I discuss different heterogeneity analysis, a sector decomposition analysis and a quantile estimation.

5.1 Gender Heterogeneity

To assess difference between groups, I analyze a different set of heterogeneity exercises. One way to examine the heterogeneity is to look at the effect of the SBFE program on different subsamples. First, I present the SBFE program's impact for each gender in Table 5.1. The results for females in Panel A show that the program had a substantial impact on females. The SBFE program's effect on females is on average 24.4 percent increase in their income at the 5 percent significance level. Slightly higher than the overall impact of the SBFE Program presented above. The results are also robust to a different set of specifications. Taken, all together, the findings suggest that females benefit from a training program that enables them to create business plans, organize their business and improve their productive and administrative techniques. Other studies have found that no significant effect on female's performance (de Mel, McKenzie, & Woodruff, 2009; Berge, Bjorvatn, & Tungodden, 2015; Fiala, 2018). This could be due to setting differences between the studies.

Turning to Panel B of Table 5.1, the SBFE program also affected males, but the point estimates are slightly lower than the estimates for females. The increase in males' income is about 18.9 percent at the 1% significance level. As in the

case of females, the results for males are robust to a different set of specification including individual controls, regional, occupation and primary activity fixed effects.

Table 5.1: Heterogeneity by Gender – Subsamples

	Dependent variable: Log of Real Income			
Variables	(1)	(2)	(3)	(4)
Panel A. Females				
Post	-.187**	-.213**	-.161*	-.128
	(.086)	(.081)	(.078)	(.077)
Eligibility	-.146	-.207	-.172	-.342
	(.816)	(.830)	(.851)	(.791)
Post × Eligibility	.255**	.237**	.258**	.224**
	(.104)	(.100)	(.100)	(.096)
Individual Controls	No	Yes	Yes	Yes
Regional Fixed Effects	No	No	Yes	Yes
Occupation Fixed Effects	No	No	No	Yes
Primary Activity Fixed Effects	Yes	Yes	Yes	Yes
R-squared	.143	.175	.188	.229
Observations	1,775	1,775	1,775	1,775
Panel B. Males				
Post	-.067	-.078	-.082	-.070
	(.059)	(.054)	(.058)	(.051)
Eligibility	-.609***	-.576***	-.554***	-.574***
	(.110)	(.111)	(.105)	(.110)
Post × Eligibility	.190**	.189**	.193**	.187***
	(.072)	(.072)	(.072)	(.065)
Individual Controls	No	Yes	Yes	Yes
Regional Fixed Effects	No	No	Yes	Yes
Occupation Fixed Effects	No	No	No	Yes
Primary Activity Fixed Effects	Yes	Yes	Yes	Yes
R-squared	.201	.225	.231	.265
Observations	1,307	1,307	1,307	1,307

Notes: The table reports OLS estimates of a matched sample. The matching estimator is single nearest-neighbor within a caliper of 0.00001 imposing common support. Standard errors clustered at year times primary activity level are shown in parentheses. Panel A presents estimates for a sub-sample of females. Panel B presents estimates for a sub-sample of males. The pre-introduction period is 2009 and the post-introduction period is 2014. The unit of observation is an individual. The individual controls are area of residence, years of education, age, household size, four regional fixed effects, eighteen primary activity fixed effects, and nine occupation fixed effects. Statistical significance at the 1, 5, 10% levels are indicated by ***, **, and *, respectively.

The heterogeneity in the impact of the SBFE program observed in this paper by gender is minimum in comparison to other studies that have found differential effects between females and males. However, it is still significant to point out that in the Nicaraguan context the introduction of productive and administrative

techniques has an impact on the self-employed workers, especially for females self-employed workers.[13]

5.2 Education Heterogeneity

Now, I turn to another heterogeneity analysis, in this case by education level. I divided the total sample into three groups of interest: (1) people with primary education or below, (2) people with more than primary education, and (3) people with more than secondary education. The three categories are mutually exclusive. Previous studies have explored the differences on the impact of programs between high-educated and low-educated individuals, and the evidence is also mixed (Bjorvatn & Tungodden, 2010; Bruhn & Zia, 2013; Cho & Honorati, 2013; de Mel, McKenzie, & Woodruff, 2008; Duflo, 2006; Premand, Broadman, Almeida, Grun, & Barouni, 2012). This has called attention because there is a possibility that people do their best under their circumstances, i.e., the poor but rational idea (Duflo, 2006). Increasing the opportunities of the poor means improving their productivity and their efficiency. Dividing the sample into the three categories presented above can give insights about expanding the opportunities for the poor.

In Table 5.2, I present the estimates of equation (4.2) for education level subsamples. To save space, I only report two specifications: (1) with individual controls, regional and primary activity fixed effects; and (2) with all controls. Other specifications without controls do not yield in different results. First, in column (1) and (2), I present the estimates for people with primary education or below. The results suggest an increase of 42 percent on the self-employed worker's income with low education, significant the 1 percent level. These re-

[13] These results are related to the composition of the labor market in Nicaragua. Female participation in the urban area is higher than the rural, and the household composition plays a significant role in the opportunities for females. Interestingly, females self-employed workers have been increasing considerable in comparison to males self-employed workers (Monroy, 2008; Martinez, 2017). In addition, according to Government of Nicaragua the creation of Child Development Centers (CDI, by its acronym in Spanish) has allowed females to continue working and has increased their employment opportunities (La Voz del Sandinismo, 2017).

sults are higher than the overall impact of the program (21 percent increase). This could be due to the target population of the problems are disadvantaged self-employed workers with low levels of education. Second, in column (3) and (4), I restrict the sample to self-employed workers with secondary education or below but not primary education. For this subs-sample, the overall impact of the program is similar to the impact on primary education or below but slightly lower with an increase of 39 percent on the self-employed workers with this level of education. Finally, I look into the effect of the SBFE program on self-employed workers with above secondary education (column 5 and 6 in Table 5.2). For high-educated self-employed workers, the SBFE did not have any significant impact on their income. The results suggest that in the context of Nicaragua, the SBFE program had an effect on low-educated people which support the 'poor but rational' idea discussed above.

Table 5.2: Heterogeneity by Education – Subsamples

	Dependent variable: Log of Real Income					
	Primary or below		Secondary or below		Above secondary	
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Post	-.269***	-.238**	-.252***	-.205**	-.112	-.074
	(.073)	(.088)	(.081)	(.075)	(.078)	(.068)
Eligibility	-.548**	-.617***	-.330*	-.334*	-.206	-.210
	(.215)	(.199)	(.178)	(.186)	(.247)	(.251)
Post × Eligibility	.455***	.401***	.421***	.367***	.164	.117
	(.131)	(.137)	(.096)	(.088)	(.100)	(.090)
Individual 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
Primary Activity Fixed Effects	No	Yes	No	Yes	No	Yes
R-squared	.251	.293	.269	.299	.335	.365
Observations	1,165	1,165	1,192	1,192	942	942

Notes: The table reports OLS estimates of a matched sample. The matching estimator is single nearest-neighbor within a caliper of 0.00001 imposing common support. Standard errors clustered at year times primary activity level are shown in parentheses. The unit of observation is an individual. The individual controls are sex, area of residence, years of education, age, household size, four regional fixed effects, eighteen primary activity fixed effects, and nine occupation fixed effects. Statistical significance at the 1, 5, 10% levels are indicated by ***, **, and *, respectively.

5.3 Sector Decomposition

I disentangle the impact of the SBFE program on all the targeted sectors estimating the following equation:

$$Y_{it} = \alpha + \beta Post_t + \sum_{s=1}^{5} \gamma Sector_s + \sum_{s=1}^{5} \delta(Post_t \times Sector_s) + \mathbf{X}'_{it}\eta + \phi_r + \pi_o + \tau_p + \varepsilon_{it}, \tag{5.1}$$

where Y_{it}, the outcome variable for the individual i, which is the logarithm of the real income, is a function of; $Post_t$ which is a dummy variable that takes the value of 1 if the period is 2014 and 0 if the period is 2009; $Sector_s$ which represents the five sectors that are targeted by the program (Agriculture and Forestry, Manufacture, Construction, Commerce, and Hotels and Restaurants); an interaction of $Sector_s$, and the $Post_t$ dummy variable; $\mathbf{X}_{it}$ which is a vector of individuals characteristics that affect income; regional fixed effects, ϕ_r; occupation fixed effects, π_o; and primary activity fixed effects, τ_p. The reference group is comprised of the non-eligible sectors.

Overall, the effect of the program seems to be concentrated positively in three sectors: manufacturing, commerce and hotels and restaurants; negatively in agriculture; and no impact for construction. The differences between sectors could be due to the overall self-employed labor structure in Nicaragua. There has been an increase of self-employed workers in the commerce and, hotels and restaurants sector from 23.8 and 2.8 percent in 2005 to 40.2 and 8.5 percent in 2014, respectively. In contrast, self-employed workers in the agriculture and forestry sector have been decreased from 31.9 percent in 2005 to 9.02 percent in 2014. These changes could have led to switch their activities those industries where they can obtain positive returns to their investments. Overall, in the hotels and restaurants sector, the self-employed workers increased the most their income, up to 44 percent (Column 4 in Table 5.3). Followed by the manufacturing industry with 32 percent and Commerce with 16 percent. However, it is

interesting to acknowledge the negative impact presented in the agriculture and forestry sector which could be due to the labor movement to more productive sectors.

Table 5.3: Sector Decomposition

	Dependent variable: Log of Real Income			
Variables	(1)	(2)	(3)	(4)
Post	-.107	-.146*	-.116	-.095
	(.090)	(.084)	(.081)	(.072)
Agriculture and Forestry	-.614**	-.723***	-.664***	-.696***
	(.291)	(.228)	(.212)	(.219)
Manufacturing Industry	-.767***	-.405***	-.378***	-.462***
	(.034)	(.050)	(.051)	(.051)
Construction	1.205***	.713***	.698***	.716***
	(.079)	(.098)	(.097)	(.143)
Commerce	.742***	.520***	.511***	.395***
	(.079)	(.081)	(.081)	(.076)
Hotels and Restaurants	.145*	.134*	.135*	-.195**
	(.079)	(.072)	(.069)	(.086)
Post × Agriculture and Forestry	-.311***	-.349***	-.372***	-.352***
	(.090)	(.093)	(.094)	(.086)
Post × Manufacturing Industry	.324***	.350***	.357***	.321***
	(.090)	(.085)	(.087)	(.077)
Post × Construction	.071	.085	.115	.116
	(.090)	(.085)	(.087)	(.078)
Post × Commerce	.137	.173*	.195**	.160**
	(.090)	(.086)	(.088)	(.077)
Post × Hotels and Restaurants	.486***	.434***	.439***	.440***
	(.090)	(.085)	(.087)	(.080)
Individual Controls	No	Yes	Yes	Yes
Regional Fixed Effects	No	No	Yes	Yes
Occupation Fixed Effects	No	No	No	Yes
Primary Activity Fixed Effects	Yes	Yes	Yes	Yes
R-squared	.231	.283	.290	.322
Observations	3,082	3,082	3,082	3,082

Notes: The table reports OLS estimates of a matched sample. The matching estimator is single nearest-neighbor within a caliper of 0.00001 imposing common support. Standard errors clustered at year times primary activity level are shown in parentheses. The pre-introduction period is 2009 and the post-introduction period is 2014. The unit of observation is an individual. The individual controls are sex, area of residence, years of education, age, household size, four regional fixed effects, eighteen primary activity fixed effects, and nine occupation fixed effects. Statistical significance at the 1, 5, 10% levels are indicated by ***, **, and *, respectively.

In Table 5.4, I present the estimations of equation (4.2) for two subsamples: (1) agriculture, livestock, hunting and forestry, and (2) manufacture sectors. When I decompose the SBFE program effect into only the agriculture, livestock, hunting and forestry subsample, the significant impact presented in Table 5.3 is no longer statistically significant suggesting that within the agricul-

ture, livestock, hunting and forestry sector, those activities that are eligible for the SBFE program are not statistically different from those that are not eligible. Moreover, the effect in the manufacturing industry is still persistent with estimations similar to those presented in Table 5.3 and statistically significant at 5 percent.[14]

Table 5.4: Sector Decomposition – Subsamples

	Dependent variable: Log of Real Income			
	Agriculture, Livestock Hunting and Forestry		Manufacturing Industry	
Variables	(1)	(2)	(3)	(4)
Post	.113	.073	-.111*	-.180
	(.085)	(.131)	(.015)	(.083)
Eligibility	-.406	-.513	-.491*	-.533**
	(.180)	(.247)	(.046)	(.020)
Post × Eligibility	-.371	-.289	.457**	.510**
	(.123)	(.161)	(.013)	(.011)
Individual Controls	Yes	Yes	Yes	Yes
Regional Fixed Effects	Yes	Yes	Yes	Yes
Occupation Fixed Effects	No	Yes	No	Yes
R-squared	.112	.129	.202	.256
Observations	179	179	310	310

Notes: The table reports OLS estimates of a matched sample. The matching estimator is single nearest-neighbor within a caliper of 0.00001 imposing common support. Standard errors clustered at year times primary activity level are shown in parentheses. The pre-introduction period is 2009 and the post-introduction period is 2014. The unit of observation is an individual. The individual controls are sex, area of residence, years of education, age, household size, four regional fixed effects, eighteen primary activity fixed effects, and nine occupation fixed effects. Statistical significance at the 1, 5, 10% levels are indicated by ***, **, and *, respectively.

[14]The contrasting significant impact between agriculture, livestock, hunting and forestry sector, and the manufacturing sector could be due to the nature of the SBFE program. The main of the program is the creation of sustainable businesses. In interviews with the participants of the program, they highlighted that another achievement is that they are more united as a family, working peacefully, and they invited more families from the rural area to start their businesses. Also, they pointed out that the seasonal characteristic of the agriculture sector pushes them to look for opportunities in other sectors. This is also mentioned by the Food and Agriculture Organization of the United Nations (2012) in its State of Food and Agriculture.

5.4 Quantile Difference-in-Differences

In this section, I conduct a Quantile Differences-in-Differences (QDiD) approach. The estimating equation is written as:

$$Q^{\tau}(Y_{it}) = \alpha^{\tau} + \beta^{\tau} Post_t + \gamma^{\tau} Eligibility_i + \delta^{\tau}(Post_t \times Eligibility_i) + \mathbf{X}'_{it}\eta^{\tau} + \phi_r^{\tau} + \pi_o^{\tau} + \tau_p^{\tau} + \varepsilon_{it}^{\tau}, \tag{5.2}$$

where $Q^{\tau}(Y_{it})$ is the τ quantile of Y_{it}, $Post_t$ is dummy variable that takes the value of 1 if the period is 2014 and 0 if period is 2009; $Eligibility_i$ is another dummy variable that indicates if the individual is eligible to be part of the program; δ^{τ} is the treatment effect given by the interaction between $Post_t$ and $Eligibilty_i$; $\mathbf{X}_{it}$ is a vector of covariates; regional fixed effect, ϕ_r^{τ}; occupation fixed effects, π_o^{τ}; and primary fixed effects, τ_p^{τ}. All the coefficients are quantile-specific. I estimate equation (5.2) for the .25 and .5 quantiles.

Table 5.5: Quantile Differences-in-Differences

	Dependent variable: Log of Real Income			
	.25 Quantile		.5 Quantile	
Variables	(1)	(2)	(3)	(4)
Post	-.145***	-.136***	-.135***	-.081**
	(.046)	(.045)	(.030)	(.038)
Eligibility	-.496***	-.678***	-.304***	-.379***
	(.079)	(.113)	(.084)	(.067)
Post × Eligibility	.170**	.230***	.297***	.282***
	(.073)	(.078)	(.060)	(.060)
Individual Controls	Yes	Yes	Yes	Yes
Regional Fixed Effects	Yes	Yes	Yes	Yes
Occupation Fixed Effects	No	Yes	No	Yes
Primary Activity Fixed Effects	Yes	Yes	Yes	Yes
R-squared	.222	.272	.280	.313
Observations	3,082	3,082	3,082	3,082

Notes: The table reports quantile regression estimates. Robust Standard Errors are shown in parentheses. The unit of observation is an individual. The individual controls are sex, area of residence, years of education, age, household size, four regional fixed effects, eighteen primary activity fixed effects, and nine occupation fixed effects. Statistical significance at the 1, 5, 10% levels are indicated by ***,**, and *, respectively.

Table 5.5 reports the estimates for the .25 quantile (Column 1 and 2) and

the .5 quantile (Column 3 and 4). For the .25 quantile, the estimates are lower than those presented in Table 4.3. In contrast, for the .5 quantile, the impact of the program is an increase of 28 percent of the self-employed's income. The QDiD are robust to the inclusion of individual controls, regional fixed effects, primary activity fixed effects and occupation fixed effects. The QDiD suggests that the impact of the program is concentrated in the bottom half of the income distribution, albeit I cannot rule out that the estimates are different from each other.

5.5 Robustness Checks

Now, I investigate the robustness of the main results on the self-employed workers' income. I modify the log of real income variable using a winsorizing method which is the transformation of the extreme values by replacing them by specific percentiles. I (re)estimate equation (4.2) using the winsorized log of real income as the dependent variable.

Table 5.6: Impact of the SBFE Program using Winsorizing Method

	Dependent variable: Log of Real Income			
Winsorizing at:	1^{st} and 99^{th}		10^{th} and 90^{th}	
Variables	(1)	(2)	(3)	(4)
Post	-.140*	-.122*	-.116*	-.099*
	(.073)	(.062)	(.062)	(.054)
Eligibility	-.415***	-.485***	-.304***	-.359***
	(.090)	(.081)	(.052)	(.045)
Post × Eligibility	.236**	.218***	.212***	.194***
	(.088)	(.075)	(.071)	(.061)
Individual Controls	Yes	Yes	Yes	Yes
Regional Fixed Effects	Yes	Yes	Yes	Yes
Occupation Fixed Effects	No	Yes	No	Yes
R-squared	.285	.317	.302	.334
Observations	3,082	3,082	3,082	3,082

Notes: The table reports OLS estimates of a matched sample. The matching estimator is single nearest-neighbor within a caliper of 0.00001 imposing common support. Standard errors clustered at year times primary activity level are shown in parentheses. The pre-introduction period is 2009 and the post-introduction period is 2014. The unit of observation is an individual. The individual controls are sex, area of residence, years of education, age, household size, four regional fixed effects, eighteen primary activity fixed effects, and nine occupation fixed effects. Statistical significance at the 1, 5, 10% levels are indicated by ***, **, and *, respectively.

Table 5.6 presents the estimations using the winsorizing method. The percentiles at which the data is winzorized are: 1st and 99th percentiles (shown in column 1 and 2), and 10th and 99th percentiles (shown in column 3 and 4). Overall, the results are slightly lower in magnitude than the main estimations in Table 4.3, but they remain positive and significant at the 1 percent level. Additionally, the results are robust to the inclusion of other controls and fixed effects.

CONCLUSIONS

This dissertation estimates the effects of the Small Business of the Family Economy program in Nicaragua on the self-employed worker's income. Overall, the results indicate that it increased the real income of the self-employed workers, in particular for less-educated workers which suggest the presence of the 'poor but rational' idea in the context of Nicaragua. Regarding sectors differences, the SBFE program affected positively in a greater way self-employed working in manufacturing, hotels and restaurants sectors and negatively in agriculture. Although these insights are related to self-employed workers and, in particular, the case of Nicaragua, they are equally relevant for more developing countries with high level of informality and self-employment. The inclusion of these individuals into the national social programs agenda can improve their earning opportunities.

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Appendices

Table A1: Summary Statistics

Variables	2009	2014	Pooled
Sex	.552	.452	.504
	(.497)	(.498)	(.500)
Years of education	6.047	6.886	6.443
	(4.516)	(4.590)	(4.570)
Urban area	.718	.808	.760
	(.450)	(.394)	(.427)
Age	42.05	42.81	42.41
	(14.30)	(14.60)	(14.45)
Household size	5.322	4.865	5.106
	(2.646)	(2.328)	(2.511)
Real income	2826.1	3267.9	3034.4
	(12451.7)	(9420.6)	(11127.1)
Log of real income	7.317	7.359	7.337
	(1.126)	(1.215)	(1.169)
Observations	4,307	3,834	8141

Notes: This table presents summary statistics for the 2009 and 2014 samples. Standard deviations are shown in parentheses. Sex is a dummy variable that equals 1 if the individual is male and 0 if the individual is female. Area of residence is a dummy variable that equals 1 if the individual lives in urban area and 0 if the individuals lives in rural area. Household size measures the number of people in one household.

Table A2: Summary Statistics by Sectors

	2009			2014			Pooled		
	Sex	Edu	Obs.	Sex	Edu	Obs.	Sex	Edu	Obs.
Non-	.476	7.335	890	.482	7.580	907	.479	7.459	1797
eligible	(.500)	(4.882)		(.500)	(4.833)		(.500)	(4.857)	
Sector 1	.913	3.117	916	.902	3.973	564	.909	3.443	1480
	(.282)	(3.291)		(.297)	(3.750)		(.288)	(3.497)	
Sector 2	.449	6.011	463	.370	6.449	381	.414	6.209	844
	(.498)	(3.953)		(.483)	(4.510)		(.493)	(4.217)	
Sector 3	.996	7.283	226	.992	6.701	127	.994	7.074	353
	(.0665)	(4.280)		(.0887)	(3.555)		(.0752)	(4.039)	
Sector 4	.433	6.693	1560	.326	7.629	1532	.380	7.157	3092
	(.496)	(4.391)		(.469)	(4.473)		(.486)	(4.455)	
Sector 5	.0714	6.591	252	.0960	6.783	323	.0852	6.699	575
	(.258)	(4.385)		(.295)	(4.248)		(.279)	(4.306)	

Notes: This table presents summary statistics for the 2009 and 2014 samples. Standard deviations are shown in parentheses. Sex is a dummy variable that equals 1 if the individual is male and 0 if the individual is female. Edu refers to years of education. Sector 1 is: Agriculture, Livestock, Hunting and Forestry; Sector 2 is Manufacturing Industry; Sector 3 is Construction; Sector 4 is Commerce; and Sector 5 is Hotels and Restaurants.

Table A3: Test of equality of means for key variables pre-treatment, 2009

	Before Matching			After Matching		
	Eligible	Not Eligible	Diff	Eligible	Not Eligible	Diff
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Sex	.574	.476	.0981	.485	.390	.0944
	(.01)	(.02)	(.02)	(.02)	(.02)	(.02)
Years of Education	5.673	7.335	-1.661	7.105	7.347	-.241
	(.07)	(.16)	(.17)	(.14)	(.17)	(.22)
Age	.668	.878	-.210	.874	.912	-.0381
	(.01)	(.01)	(.02)	(.01)	(.01)	(.02)
Area of Residence	42.75	39.37	3.374	40.65	41.14	-.497
	(.25)	(.45)	(.54)	(.39)	(.42)	(.57)
Household Size	5.296	5.434	-.138	4.921	4.827	.0941
	(.04)	(.09)	(0.10)	(0.06)	(.06)	(.08)

Notes: This table reports descriptive statistics on the key variables. Standard errors are shown in parentheses. The estimations for column (1), (2), (4), and (5) come from a regression framework where the independent variable is the interpect of the variable. Column (3) and (6) present the differences between eligible and non-eligible individuals.