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Estimating The Forgone Income Of A Workfare Program: Case Colombia.

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Abstract: Colombia, as many Latin-American countries have designed a series of welfare programs in order to relief poverty, due to the crisis experimented during the 90s. Hence, the present research estimate the impact on earnings of one of the welfare program implemented in Colombia “Empleo en Acción” and see the possible forgone income from participate in the program. Thereby, based on Diff-Diff method the research obtained as a main results that the program produce an average increment in earnings, where the younger and women participants have greater increment than the other groups of participants. However, forgone income where found for participants, which could represent that the program may displaces work and it confirms the hypothesis that participants who join the program may face a high opportunity cost in the short term.

Key words: Workfare program, Welfare program, Forgone income.

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Introduction

Many Latin American Countries at the end of the 90s, after decades of crisis, initiated a series of social programs in order to mitigate the consequences of the crisis in terms of health, education, unemployment, housing, migration and violence, among other social issues. The government increased its participation on the economy and took a more active roll in the economic performance, basing most of its support in welfare programs, which target household living in poverty, and promoting some activities that could improve their living standards. Hence the following research will estimate the forgone income of one the welfare program designed in Colombia, Empleo en Acción (Employment in action), based on the net earning gains for those who participate in the program.

Colombia as many Latin American countries also suffered the consequences of the crisis, having a fall of 4,2% of the Gross Domestic Product (GDP), as a consequence of the financial and currency crisis in the Asian countries, Russia and Brazil. The weak position of the Colombian economy experienced large fiscal and current account deficits. The corrective economic policies implemented by various economic authorities were contradictory, slowing its effectiveness and creating more uncertainty in the private sector.

The institutional changes put to Colombia in a delicate political situation, and law and order situation, which further undermined investor confidence and provokes an institutional weakness that represent an increment of the drug traffic and violence during two decades (80s and 90s) (Cardenas; 2007, Parra Torrado, 2001). Then, the Government designed and coordinate through the Ministry of Social Protection the “Red de Apoyo Social” (RAS - Social Network Support) which consists in a series of social programs “Familias en acción” (families in action), “Empleo en acción” (Employment in action) and “Jóvenes en Acción” (Youth in action) that respond to the need to protect the poor, given the high level of unemployment in the country and the consequent fall in income experimented in their families due to the crisis.

Due to the great importance of these welfare programs, this research pretend to measure the impact of one of these programs, “Empleo en Acción”, which is focused on provides a temporary employment at the poorer and unemployed proportion of the population in order to mitigate loses in income, which has been viewed as a successful program due to the positive impact in poverty reduction and the great benefits obtained from the project of infrastructures done (DNP, 2007).

However, Chacaltana (2003), Galasso and Ravallion (2003) Datt and Ravallion (1994) have found that there is a probability that the workfare programs could generate a forgone income, even when the participants come from unemployment, because to join at the program represent an opportunity cost for participants, which could reduce the net earning gains from the program; and in addition, if this fact is not bearing in mind the impact of the program on income and poverty reduction could be overestimated. For that reason the present research will estimate the impact of the program on earnings. Specifically, it will measures the net wage gain from the program, based on difference in differences method, which compare individuals who participate in the program, with those who do not. Under three hypothesis: 1) high forgone income for those who participate in the program; 2) lower forgone income for young and 3) and lower forgone income for women¹. For such purposes, the research will be divided in 5 section: 1) program description; 2) Literature review; 3) Data and methods; 4) Results and 5) Conclusions.

1. Program description

As was stated before, the program “Empleo en Acción” makes part of a set of two more programs, denominated, “Red de Apoyo Social” (RAS), which, according to the National Planning Department of Colombia, has as a main propose mitigate the economic effect of the crisis and fiscal adjustment in the country for those who are living in poverty and avoid the irreversible damage to their ability for to be economically productive, like increase in malnutrition among children under 6 years, increase of common diseases and reduce the

¹ The hypothesis are explained in more detail in the subsection of Mechanism .

² Classification System of beneficiaries used by the Colombian government to focus on poorer

dropout rate.

At the same time, the RAS also tries to increase temporarily the income of the poorest families. Increase the employability of disadvantaged youth SISBEN ranked 1 and 2, who have the highest unemployment rates (around 40%) and generate temporary jobs and contribute to the expansion of physical and social infrastructure of the poorest.

Then, “Employment in Action” under this context was aimed to provide a temporary employment to unskilled levels 1 and 2 of the SISBÉN², in the construction or maintenance of community infrastructure in urban low-income neighbourhoods defined as stratum 1 and 2. To mitigate the impacts of the economic crisis of 1999 and the fiscal consolidation that had to make the Colombian government on the most vulnerable populations, specifically the population of unemployed adults classified in levels 1 and 2 SISBÉN, who were not enrolled in a diurnal educational program.

To reach these proposes, the program provided resources for the payment of unskilled labour and to partially cover the purchase of materials. For unskilled work the program provided a wage of 180,000³ Colombian pesos per month per beneficiary (at 2001 prices) for a maximum of five months days halftime. The Projects to be financed by the program should have a total cost between 400 and 300 million pesos (at 2001 prices) (204,991.54 and 153,743.66 dollars, respectively). Proponents could be departments, districts, municipalities, non-profit organizations, NGOs or community-based institutions. The proponent must ensure the resources necessary as a counterpart to complement the contributions of the program and cover, as well as, the total project costs.

The program funded from the end of 2000 a total of 3.7244 projects or schemes, of which 37 % (1,384 plays) were located in a set of 71 of the 78 municipalities prioritized for the program, which included 24 major metropolitan areas of the country and other municipalities of more than 100,000, and the remaining 63 % (2,340 projects) in a et of 581

² Classification System of beneficiaries used by the Colombian government to focus on poorer social spending. Levels 1 and 2 grouped the poorer fraction of the population.

³ One Dollar corresponds to \$ 2.291,18 pesos, at 2001 prices.

non-priority municipalities of less than 100,000 inhabitants, or were not part of metropolitan areas and conurbations (DNP report 2004).

2. Literature Review

Historically, governments in developed and developing countries have tried to relief poverty, considering that poverty exist in a society when one or more persons not have a level of economic well being that allows them to have a reasonable minimum standards of living, Ravallion (1994). Anthony Atkinson and François Bourguignon (1999) also define poverty as the inadequate availability (access) to resources. The World Development Report of the World Bank 2000/2001 states that poverty is "a pronounced loss in welfare." Finally, Amartya Sen (1985) gives a qualitative definition of poverty as the lack to develop capabilities and entitlements what make a person poor.

However, is also necessary to bear in mind that poverty is a multidimensional phenomenon that could be affected by the level of income, attendance rate (maxim level of education reached), geographic conditions, investment rate or demographic conditions among others. And, since the economic growth and macroeconomic stability could not completely help to reduce the poverty rates, most of the governments have tried to develop a series of programs (welfare programs) related with wellbeing of the society, in order to accelerate and balance the process of poverty reduction Bouillon and Tejerina (2007).

Under this framework, one of the most famous programs related in terms of welfare programs is the Poor Law of England designed in 1661, which tried to offer support to the poorest proportion of the population, through the administration of the local parishes, which where responsible for the finance and administration of the poor relief. Thus, the "Overseer of the Poor" and the "Warehouses" had as main task to know all the poor offer assistance to them and find Jobs for unemployed. Brown and Oates (1986). The law restrict the responsibility of the parish to their own poor people, and established another law related to settlement and removal, which tried to control the migration of people, looking for better benefits (Fraser, 1976). However, Brown and Oates, based on Tate (1969) highlight that the

program represented a high cost to remove and reallocate the poor between parishes, considering the Law “largely an account of efforts to deny support to, and to deport, the itinerant poor”, also highlighting that the trade off whether to support the poor or not, since the support could discourage them to work, due to most of them adapt their condition to the keep in the poverty condition and then keep receiving the benefit, or not offer support to them and left them in poverty.

In addition France also present and historical evidence from the “Charity Workshop” established after the floods of 1783 - 84, due the hard winter experimented by the country during these years, with incenses snowfall and floods, which brought as a consequence that many manufactories and mines close, increasing unemployment. Then as a response to this phenomenon the governments of some provinces designate recourses from the tax budget, through workshop, instead of dole, since it could encourage indolence among the beneficiaries. Later the central government due the winter extension also send found to support the workshop and rebuild Bridget and streets. However, despite the high cost that represented the workshop and the infrastructure works, the program helps to alleviate the poverty problems produced for an external shock (McCloy, 1948).

But the welfare programs remain nowadays popular within the developed and developing countries as a measure to relief poverty. Then, as a part of welfare programs packages, where jointly with other series of programs (like cash transfers programs, early childhood development, nutrition, health, education, microfinance, land titling and training programs, among others) have tried to improve the wellbeing of the most vulnerable proportion of the population. Therefore, based on the importance of these social programs, as a complement for the development, politician and community in general have arouse an increasing interest to know, how effective or what is the impact of these programs in terms of wellbeing. In this sense, some author have estimated the impact of some programs for early childhood development like the PIDI program in Bolivia, evaluated by Behrman, Yingmei, and Petra (2004) and the Hogares Comunitarios de Bienestar Familiar (welfare homes) program in Colombia (HCBF), evaluated by Attanazio and Vera-Hernandez (2004). Using propensity score techniques for PIDI and instrumental variables for HCBF, have shown a positive

impact given by the improvement on the test scores of the children, focus of the program,. Similarly, the program HCBF has shown positive impact in the anthropometric nutritional indicators.

Close to the programs described before, some countries like Colombia and Guatemala also implemented programs focused in the Nutrition at the early ages, where basically the programs provide food or supplement for children during the first three years of life were the selected beneficiaries were choose randomly. Hence, in this sense Mora (1981a,b) and Schroeder, Kaplowitz, and Matorel (1992) provide evidence of the main impact of the programs, where in average both programs present improvement in growth and Guatemala in addition also presents improvement in the attendance rate for mothers who receive the supplements.

Finally, probably one of the most famous programs during the last decade have been the conditional Cash Transfers programs (CCT), since have became to be an important tool to improve education and health outcomes of poor children in developing countries, like Honduras, Colombia, Brazil, and Mozambique. All of them, based on the cash transfer program designed in Mexico, “Progresas”, now denominate “Oportunidades”, which basically involve target families or household living in poverty, and through conditional transferences to the mother, promote some activities that could improve the child welfare, usually those below the age of 6, having as a conditionality visits to preventive healthcare centres in which their growth is monitored and School attendance, which is the most common stipulation for receipt of cash transfers for older children (usually those between 7 and 17 years old) (Attanasio, and Mesnard, 2005). Where the same author shows positive result for the CCT program for Colombia (Familias en acción), based on propensity score matching, and diff- diff where the attendance rate for children treated, increase in average. However, since the focus of this research is the workfare programs, the following section will present the main result and benefit obtained from it.

However, Tabor (2002) highlight that the experience of developed countries shows that Cash transfers can generate upward wage pressures, discouraging job search, change

patterns of consumption towards leisure, eliciting early retirement, stiffen the labour market and increase unemployment rates in the medium and long term, including negative consequences. It also points out that the occurrence of these effects, also called negative incentives costs or poverty traps, will depend on the factors causing unemployment, the characteristics of the labour market and the design of the interventions.

After analyse some of the welfare programs and their main findings, is also necessary to mention that there are another series of programs within the welfare programs which try to tackle the labour market issues, as well as to help to reduce poverty. Such as the “Labour Market Programs”, which could be divided in three categories: 1) Training program, 2) Employment Services program and 3) job creations program (workfare program). Where, the two first alternatives of labour market programs (Labour Market Training and Employment Services) have as a main propose develop labour skills that facilitate the entrance to the labour market, or through the Employment Services Programs match available jobs with job seekers, including activities like labour exchanges, interviews at employment offices and job clubs among others. As happen with the training program implemented in Australia between 1994 and 1995, which tried to give support to the unemployment population through training and employment skills. Stromback et al (1999),based on logit on the probability of staying in the labour force and on employment., found that the program had a positive effect on employment training, but did not found effect of the skills training activities. Colombia also has implemented training programs, under the direction of the “Servicio Nacional De Aprendizaje” (National Learning Service) (SENA), which tried to provide training and job search for youths and to displaced population, in order to help these population to have a better labour adaptation. Thus, Medina and Nunez (2001) using quasi-experimental matching, obtain as a result that there are no significant impact of the program for both gender, in terms of employment and earnings.

Similarly, Chan and Suen (2000) also measure a training program in China, which sought compensate the displaced workers, based in a courses to develop self confidence and labour skills like languages and computers. After apply fixed effects estimation of earnings,and

random effects probit of employment status, found that the self-confidence courses did not have significant effect on earnings and the training programs had very low significance on earnings. On the other hand, the beneficiaries of the training program have a significant and negative effect on employment. However, Jacobson and Petta (2000) present positive results for the program implemented in United States, which provides support to job seekers, since the job seekers beneficiaries of the program and with strong experience, reduce the time in unemployment and increase their earnings in relation to the control group. Argentina also experimented a positive experience with the program Proempleo, which offers a voucher to employers from the private sector that subsidy part of the salary paid to the employee. Having as a result a higher probability of employability for women and younger people (Galasso et. al 2001).

Regarding to the job creation programs, as the other series of programs, represent another way to face the labour market issues. For that proposes this category of welfare program has the “Workfare” program, focus of this research and explained in the following subsection.

2.1 Workfare Programs

Gueron (1990) refers to "workfare programs" as a mandatory work-for-benefits program—using either the Community Work Experience Program or WIN (Work Incentive) work experience approaches. On the same way, Ravallion (1998) argues that workfare programs are designed for participants who have to work in order to obtain benefits, usually planed in times of crisis, like macroeconomics or climate shocks, in which a larger number of poor become unemployed. Chambers (1989, p. 3) also defines a workfare program as a “general income redistribution scheme used by the government to prescribe the budget set of each individual in the economy by an appropriate definition of taxes (income, excise), subsidies (welfare programs, unemployment insurance, etc.), and employment opportunities”.

One of the main reason which have promoted this type of program (Workfare program) are given by the fact that most of the welfare programs are associated with the idea that are

economically inefficient since beneficiaries could report forego productivity or employment in order to qualify for the program's benefits Chambers (1989). Idea also supported in the past for the richer classes in France, who considered the "dole" as the wrong way to reduce poverty, since it could perpetuate instead of reduce the poverty condition, discouraging people to work (McCloy, 1948). Gueron (1990) also points out the problem of forgone employment, emphasizing that the main difficulty at the moment to formulate the Workfare programs is the effort to achieve two objective: 1) reduce the poverty and, 2) encourage self employment; since, as the other authors mention before, the support given by the government could decrease the incentives to work. Because, if they work more, less assistance they receive. Additionally, as a consequence "any effort to increase benefits to combat poverty more effectively will only further decrease the incentives for recipients to take low-paying jobs and work", but in addition, there is another challenge or trade off at the moment to measure the benefit of the program, since there are different ways in which a workfare program might reduce poverty: 1) Providing work for the unemployed from poor households and, 2) Producing things of value to poor families. Thus, the workfare programs tend to represent a benefit between the value of the assets created and the employment. Due to the objective of this research is focus in the income gains and forgone income produced or not for the program, the second objective of the workfare program will not be analysing here.

Despite the benefits offered by the workfare programs, some authors also have highlighted some problems that could arise from this type of programs, as could be the foregone income, understanding for forgone income, the income losses by participate in the program. Since as is mention in Jalan and Ravallion (2003), one of the most common assumptions with this type of programs is that the gross wages paid is the correct measure of the income gains of beneficiaries of the program, if they come from unemployment. But as the same authors say, "it is not always the case"; due to join the program represent an opportunity cost, represented by the time left to find job.

In this sense, Galasso and Ravallion (2003) present evidence from the Argentina's workfare program "Plan Jefes y Jefas" also designed as a response to the crisis of 2002,

providing direct income support to families who were suffering from unemployment due to the crisis. Thus, based on propensity score and differences in differences technique. The authors found that the net income gains from the program were heterogeneous, where those who were unemployed/inactive before the program had no foregone income. While, those who were previously employed had a high foregone income. And the female head of the household had on average larger net gains. In similar research Ravallion (1991) after studying the workfare program for South Asia, says that the foregone income, or other costs of participation, is not high for the poor.

Chacaltana (2003) also presents evidence from the program “Trabajar Urbano” from Peru, who also based on Propensity Score Matching, due to the lack of counterfactual. After establishing the differences between the treatment and control group, found that there is a small net gain on income for those who were beneficiaries of the program, where the foregone income represents a 24% of the nominal transference from the program. Identifying problems of targeting, which probably also could explain the low impact of the program in terms of income, even when the program offers a lower wage than the minimum wage of the country.

Finally, Jalan and Ravallion (2003) estimate the benefit of the workfare program from Argentina by Propensity-Score Matching, finding that the foregone income is lower for the younger proportion of the population treated, presenting higher income net gains, probably because the low level of expertise, which represents not only a higher probability to participate in the program if not also a lower cost of opportunity, also presents gains for male and female, being identical for both genders.

2.2 Mechanism

As was mentioned before, it is not plausible to think that the net gains, in terms of earnings, for the beneficiaries is given by the gross wage paid to the beneficiaries, since joining the program represents an opportunity cost for the beneficiaries. As Galasso and Ravallion (2003), Ravallion (1998) support the idea that workfare programmes could produce foregone

income, due to is not possible to think that all individuals or beneficiaries of the program would have been inactive in the absence of the program, then leading to an “overestimation of the impact on poverty if one ignores the foregone earnings of workfare participants, who are unlikely to be entirely idle in the absence of the program” (p.4). Since even workers who come from unemployed face a positive probability of finding additional work, including self-employment or some form of activity in the informal sector. Then the program could represent less time available for job search. Representing that the net wage gains will be less than the gross wage paid.

Ravallion (1998) provides a clear idea of the mechanism of how the net gains could work. For instance, a typical poor worker under unemployment and looking for a job at the beginning of the workfare program face a probability P^* to find additional job and a wage W^* . Then, under the scenario that the worker does not join the program, the expected income will be $P^* \cdot W^*$.

Now, after introduce the employment program the probability of finding additional work that is unrelated to the program, while is working on the program is P (which may not be equal to P^*). The wage under the program is W . Then, the expected gain in income from to be available the program "Work" is $PW^* + (1-P)W$. Therefore, the net gain in expected wage (NW) in favour of workers attributable to the introduction of the scheme is:

Equation 1

$$NW = (1-P)W - P^* - P)W^*$$

Then, under the same scenario, where the individual join the program, could represent that the worker can not find a regular job and therefore has zero chance of getting such employment $P = 0$. Thus, the projected gain is $W - W^* P^*$ (the wage under the program less income projected from finding regular employment).

However, the dynamic explained before could not fit with the type of programs that offer a part time job as *Empleo en Accion*, since Ravallion says that the programs that offer a part

time job compensate the search time lost, because they can still looking for a job out of the working hours. In addition, the author also highlight that the program could increase the experience and knowledge of the beneficiaries, which could probably help then to obtain a regular job. Therefore, the program under this context could not affect the forgone income, since $P = P^*$ being the expected gain is the ratio of time that the worker would otherwise remain idle, multiplied by the wage level.

But, since some workers face some relatively low probabilities of finding full-time job or even part time job, even having available the full time to do it Gueron (1990) and Ravallion (1998). Naturally, such workers will find more attractive the wage offered under the program. And given the high unemployment rate of the country (around 18%), Arango and Posada (2005), Torrado and Becerra (2010)) and since the poorer proportion of the population tend to have a high probability of being unemployed, is reasonable to assume that the Participants will face a low probability to find a job. Then, under this framework the study may expects to find a low forgone income for those who participate in the program “Empleo en Acción”. Also because the demand for not qualify labour force decreased during the 90s Sánchez and Núñez (1998) which imply that this projects could represent an important answer for those who are no qualify labour force, due the characteristics of the projects. Which are related to infrastructure project that mostly hire no qualify labour force. However, due the recovery of the economy during which started around 2003 (Cardenas, 2007), probably the participants could face a high opportunity cost from participate in the program. Hence, the research will expect to find a high forgone income from participate in the program.

In addition the research will expect to find a lower forgone income for young and women since these groups have presented a higher levels of unemployment, in comparison with the men during the 90s (Henaó and Parra, 1998); DNP report, 2000), at the same time the authors report a constant increment of wages during the decade, but at the same time the women wages remained being lower in comparison with men wages (Sánchez and Núñez, 1998). This fact could makes that probably the opportunity cost for women could be lower (if they join the program) than the opportunity cost for men.

To summarise, under this framework, the research will expect to find: 1) high forgone income for those who participate in the program; 2) lower forgone income for young and 3) and lower forgone income for women.

3. *Data and Method*

3.1 *Data*

The research will be based on the data available by the program which allows to work with the base line, that permit observe the main characteristics of the population before or at the time they were starting the works and the beneficiaries had not received any payment (was collected between December 2002 and December 2003). Also two samples, was obtained. One of then during the implementation of the program and another one, after 4 or 13 month after the project had finished.

Originally the program was designed for the beneficiaries to be selected randomly. Specifically, through a lottery were selected individuals "beneficiaries" (individuals who were randomly selected) and "registered" (individuals who were randomly rejected) should have been selected among a group of individuals interested in participate in a determinate project. However, the data according to the DNP report, did not work as was planed and the selection was not random at all, as at the beginning was designed, due the following problems or differences in the implementation and selection process of the program.

1. The first differences found at the moment to analyse the data, comes from the differences in the implementation of the program vary from priority and not priority areas, since the priority areas present a better project monitoring and control system, which was reflected in a more randomized proses at the moment to select the program`s beneficiaries, in comparison with the no priority areas⁴. Probably because projects and counterpart of the project were bigger in the priority areas, which implied more controls in the selection and execution of the projects. Another fact to

⁴ Priority areas: Municipalities over 100,000 inhabitants and peri-urban interface / No priority areas: Municipalities of less than 100,000 inhabitants without conurbation.

take into account and also could explain the differences in the program implementation are given by the fact that the selection process in some no priority areas are influenced by illegals groups, manipulation of politician and other stakeholders involved in the process could generate bias in the selection processes (DNP report, 2004). However, the qualitative report of DNP (2004) indicates that beneficiaries consider that the selection process was perceived as fair by the people interested, and was widely accepted.

2. Another problem reported by the same DNP report is given by the fact that due to the uncertainty generated by the delays at the moment to start the projects, some people selected as a beneficiaries drop the program, founding other job. Then, those who were non-beneficiaries at the beginning became beneficiaries. Producing a crossover effect, which also could bias the program. Hence, there is another possible bias in the data, since some beneficiaries and non-beneficiaries enrolled who were allegedly unemployed at the time they enrolled, they were working at the time of collect the baseline, before initiation of the projects; which means that the variables related to the individual's employment status (employment, unemployment, income labour, etc.), as measured by the baseline survey had already been affected by expectations, positive or negative, created by the program.

In addition is also necessary to mention that, due to the delays of the project the chosen beneficiaries in the baseline were not the same participant, and the non-beneficiaries in the baseline became participant in the follow up survey. Then, there is a cross-effect that also bias the use of participant as a treatment group, because probably those who wait for a long period of time, until the project start, have a different characteristics that those who could no wait. It imply probably that those who wait for a long time have less chance to enter in the labour market, that the other who drop the program. Which coincide with the theoretical perspective, proposed by Gueron (1990) who argues that there are differences within the poor, in terms of labour market accessibility.

3. As a product of the implementation, the municipality of “San Vicente del Caguan” that

held a housing program funded primarily by the Mayor further used resources from the program Programme. The subsidy received by each beneficiary was much higher than the assigned in other municipalities and included excessive starting materials; additionally, the beneficiary usually subcontracted two or three people who in most cases were skilled construction workers. Then, Because of this the decision to exclude projects of the municipality of the assessment was made.

Finally, after take into account the bias presented before, was necessary to construct a base line without the individual who were participating in the program at the moment to build the base line survey, in order to reduce the anticipatory effect on earnings. The projects from San Vicente del Caguán were removed due the inconsistencies in the programs implementation explained before. Then after create a new base line was possible to work with 2,255 Participants and 2154 Participants, while, the final Beneficiaries were 2.276 and Non-Beneficiaries 2.133 (Table 1).

Table 1: final number of Participants and Beneficiaries

Participants	Non Participants	Beneficiaries	Non-beneficiaries
n= 2,255	n=2,154	n=2,276	n= 2,133

Source: Author. Empleo en Accion Survey

Where:

Participants: those who finally participate in the projects.

Non participants: those who finally do not participate in the projects.

Beneficiaries: those who were chosen as beneficiaries initially.

Non-beneficiaries: those who were chosen as non-beneficiaries initially.

After compare the Participants and Non Participants from 26 variables, was possible to see that the 73% of the variables show differences between both groups⁵. Table 2. Where, after analyse the differences between participants that were not found in the beneficiary groups, was possible to see that, there are no many differences between then. Table 3. Where the education level represents the mains differences between participants and no participant, having the participants a lower level of education in average.

⁵ To see the differences between beneficiaries, see annex 1.

At the same time, in terms of income the participants tend to have lower earnings than the non participants, after analyse the earnings for both groups in the year 2000. Which could support the idea expressed before, that the final Participants are different to those who were initially targeted as a Beneficiaries, due to the delays in the projects.

Table 2: Comparison between Participants and Non participants

Variable	Participants	Non participants	Diff	P-Value	
	n= 2,255	n=2,154			
Age	34	35	-1	0.31	
Gender	69.71%	59.66%	10.06%	0	***
Married	24.26%	21.77%	2.48%	0.05	**
Single	25.85%	24.00%	1.48%	0.257	
Head Of Household	52.11%	46.66%	5.45%	0	***
Spouse Of Head	14.94%	19.36%	-4.41%	0	***
Son Of Head	25.41%	25.53%	-0.12%	0.925	
No Education	11.49%	8.08%	3.41%	0	***
Incomplete Primary	30.20%	27.48%	2.72%	0.047	**
Complete Primary	22.00%	24.42%	-2.42%	0.057	*
Incomplete Secondary	21.02%	24.28%	-3.26%	0.01	***
Incomplete Secondary	13.88%	13.88%	0.00%	0.999	*
Higher Education	1.37%	1.86%	-0.48%	0.205	
Main Material Of Interior floor (Ground)	22.71%	16.62%	6.08%	0	***
Main Material Of Interior floor (Cement)	59.02%	62.86%	-3.84%	0.009	**
Main Material Of External Wall (Wood)	10.95%	7.43%	3.53%	0	***
Main Material Of External Wall (Blocks)	65.45%	74.42%	-8.97%	0	***
1 Room House	17.69%	17.18%	0.52%	0.651	
2 Room House	27.58%	22.28%	5.30%	0	***
3 Room House	27.58%	22.28%	5.30%	0	***
4 Room House	18.80%	19.92%	-1.11%	0.35	
Vulnerability: Affected By Violence	8.91%	9.89%	-0.98%	0.268	
Vulnerability: affected by unemployment	23.90%	28.76%	-4.86%	0	***
Health impairments for activities	10.91%	16.72%	-5.81%	0	***
Work in 2001	78.61%	74.70%	3.91%	0.003	**
Work experience before	15.29%	12.16%	3.14%	0.449	
Earnings 2000	167,144.8	197,236.8	-30,091.98	0.042	**

Significance: *** p<0.01, **p<0.05, * p<0.1

Source: Author. Empleo en Accion Survey

Thus, the final participant is probably less motivated or have a lower probability to enter into the labour market, as was expressed before. For that reason in order to avoid possible bias in the estimations, the impact will be measure with the Beneficiaries as instrument, instead of the Participants. As will be explained in the following subsection.

Table 3: Differences Between Participants And Non Participants That Were Not Among The Beneficiaries And Non Beneficiaries

Variable	Participants n= 2,255	Not participants n=2,154	Diff	P-Value	
Incomplete primary	30.20%	27.48%	2.716%	0.047	**
Complete primary	22.00%	24.42%	-2.424%	0.057	*
Incomplete secondary	21.02%	24.28%	-3.260%	0.01	***
Incomplete secondary	13.88%	13.88%	-0.001%	0.999	*
Earnings 2000	167,144.8	197,236.8	-30,091.98	0.042	**

Significance: *** p<0.01, **p<0.05, * p<0.1

Source: Author, Empleo en Accion Survey

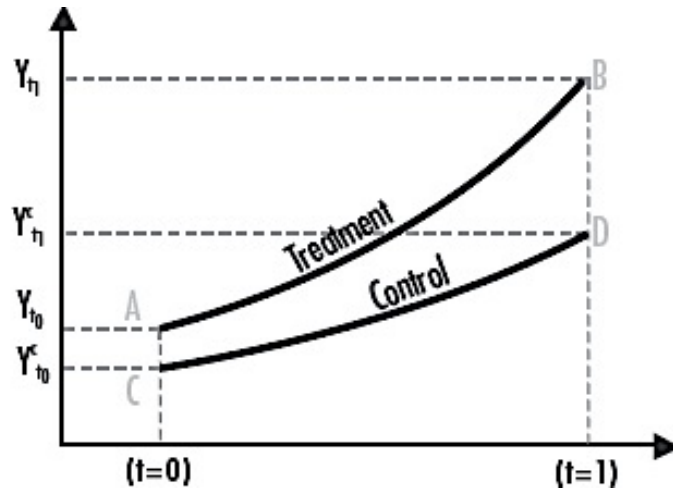
3.2 *Method*

The main proposes of an impact evaluation is to measure the value or gains obtained due to participate in a specific program, estimating the changes in a particular outcome variable (in this case the changes on earnings) that is attributable to the program, independently to other factors which could affect the outcome variable at the same time. (Ravallion 2007) Bouillon and Tejerina (2007).

Therefore, in order to see the effect of the program on the net gains in earnings from the program, the methodology proposed is the “*differences in differences*” method, which basically compares the treatment and control group, in order to see changes attributable to the program. Thus, the main mechanism consists in the one where *outcomes* are observed for two groups for two time periods, where one of the groups is exposed to a treatment in the second period but not in the first period. The second group is not exposed to the treatment during either period, in order to take into account that other factors such as macroeconomic conditions, natural disasters, or other interventions and covariate shocks that may have affected the outcome variable at the same time. Then the method estimates or

compares the changes changes on earnings (outcome variable) before and after the program between participants and nonparticipants. It is given by $[(Y_{t1} - Y_{t0}) - (Y_{c t1} - Y_{c t0})]$. Figure 1. Bouillon and *Tejerina* (2007), Wooldridge (2007)⁶.

Figure 1



Source: Bouillon and *Tejerina* (2007)

For that proposes the research take information from the baseline, to see the pre-conditions before the implementation of the Program, and then from the *follow up* survey done to the same household of the baseline to observe the changes in the treatment and control groups, in order to establish what has been the impact of the program on the population beneficiary.

But, due to the problems presented in the implementation of the program (delays in the initiation of works in some projects, the no random selection in some projects) explained above, before to apply the diff-diff method, was necessary to subtract some differences between the treatment and control group in order to reduce the bias, at the moment to estimate the impact of the program. Since depends on finding a valid control group is one of the success at the moment to measure impact under this method Ravallion (2007).

Therefore, since is no possible to establish an experimental design based on random selection of beneficiaries, it is necessary to do a quasi-experimental design; used when it is

⁶ Imbens/Wooldridge, Lecture Notes 10, Summer '07 Difference-in-Differences Estimation

not possible to select a control group randomly. Hence, One of the alternatives is the Propensity Score Matching technic. However, the DNP report (2004) provides evidence that the technic does not work for this program since was no possible to identify an appropriate comparison group, method that could be used in “Families en Action” (Colombian Conditional Cash Transfer Program). Where the program was offered to all eligible families in the municipalities of Treatment. While the “*Empleo en Accion*” program where eligible individual had to made the decision to get or not involve in the program. Then, the situation is different and the motivation to pass from beneficiary to participant could be explained by unobservable variables such as skills, motivations, and social contacts. Hence, since these variables are not observables, the Propensity score matching is not possible to use.

Another method is the *Instrumental Variables (IV)*, which is one of the econometric techniques that can be used to compare program participants with nonparticipants, correcting selection bias. It consists of using one or more variables (instruments) that are relevant to participation but not to the results of participation. Which means that it identifies the exogenous variation in the outcomes attributable to the program, recognizing that the selection of participants could not be random, but rather based on no explicit criteria for operators. Thus, the strategy is that, the IV is first used to predict program participation, given that the individual is eligible; and then the program impact is estimated using the estimated values for this prediction.

Then, The IV method helps to correct the two biases found in the program, related with the program implementation: 1) to correct the bias between the treatment group (persons initially selected as beneficiaries) and the control group (registry not initially selected as beneficiaries); and 2) to correct the bias between people initially selected as beneficiaries and individuals who participated eventually working in the projects. In this case, the instrument used to predict participation in the program was to be “Beneficiary”, since as a IV is relevant to participation, but not to the results of participation.

Then, to measure the program impact on the net gains in earnings in the short term and take into account the possible bias produced by the no randomization selection of participants and the anticipatory effects on the base line, due to the delays in the projects. The operationalization is the following:

Equation 2

$$E \{(Y_{it} - Y_{it-1} - \alpha P) - \beta X_i / B_i\} = 0$$

Where “E” is the expectative operator. “ Y_{it} ” Is the value of the outcome variable in monitoring, Y_{it-1} is the value of the outcome variable at baseline and “ P_i ” is 1, if individual “ i ” participates in the program and 0 if is not involved (bearing in mind that the P_i is not the value observed from the surveys, if not the value estimated from the instrument) and “ X_i ” is a set of predetermined variables which do not change over time and can influence the results but not participation decisions, β and α are the corresponding parameters.

We obtain a consistent estimate of the impact of the program, since the selection of B would not be correlated with the impact ($Y_i - Y_{it-1}$) if X predictors of the outcome vector, incorporates this effect, conditioned by the observed variables.

This equation allows to obtain consistent estimates in projects where the selection of the beneficiaries was not random, to the extent that the probability of selection of B is uncorrelated with all unobserved determinants influencing the outcome variables (motivations, expectations, skills, etc), given the observables, if being controlled through the vector X. Although this assumption cannot be tested directly, you can test whether the non-random selection of B is correlated with observable characteristics, including values of the outcome variables at baseline.

However, if there are no observable variable (X) that has a significant influence on the results in the presence of variable participation, the impact of the program can be measured with a simplified equation, which can be cleared using the equation as “ P_i ”, not the

observed value of participation, but the calculated value through instrumental variables.

Equation 3

$$E \{(Y_{it} - Y_{it-1} - \beta P_i) / B_i\} = 0,$$

Therefore, the stages proposed to develop this method are the following:

As a first stage the probability of participation was estimated, using as instrument status has been preliminarily selected as “Beneficiary” ($B = 1$, if Recipient, and 0 if not selected as a beneficiary enrolled).

Equation 4

$$P_i = \beta_0 + \beta_1 B_i + \gamma_i$$

Where $P_i = 1$ if individual i participates in the program, and 0 otherwise.

Finally, in the second stage the estimated value of P with the instrumental variable B is used to estimate the impact of the program:

Equation

$$Y_{it} - Y_{it-1} = \delta_0 + \delta_1 P_i + e$$

Where the impact of the program is measured by the δ .

4. Results

The following section will present the main results obtained with the methodology explained before. Which try to measure the program impact in terms of income, in order to see the net gains for those who take part in the program. For that proposes the methodology suggest to perform a diff-diff based on an instrument (Beneficiaries) that could help to reduce the bias in the estimations done. However this section will present both results, one based on the participants and other with the IV (Beneficiaries). Finally, it also will present the limitations or caveats from the results obtained.

4.1 Net gain (OLS and IV estimations)

The results were obtained from the equation 5, which measure the changes or the net gain in income through the time, after compare the participants and No Participants.

Equation 5

$$\Delta y = \beta_0 + \beta_1 * Part + \beta_2 * Year + \beta_3 * Part * Year$$

Where:

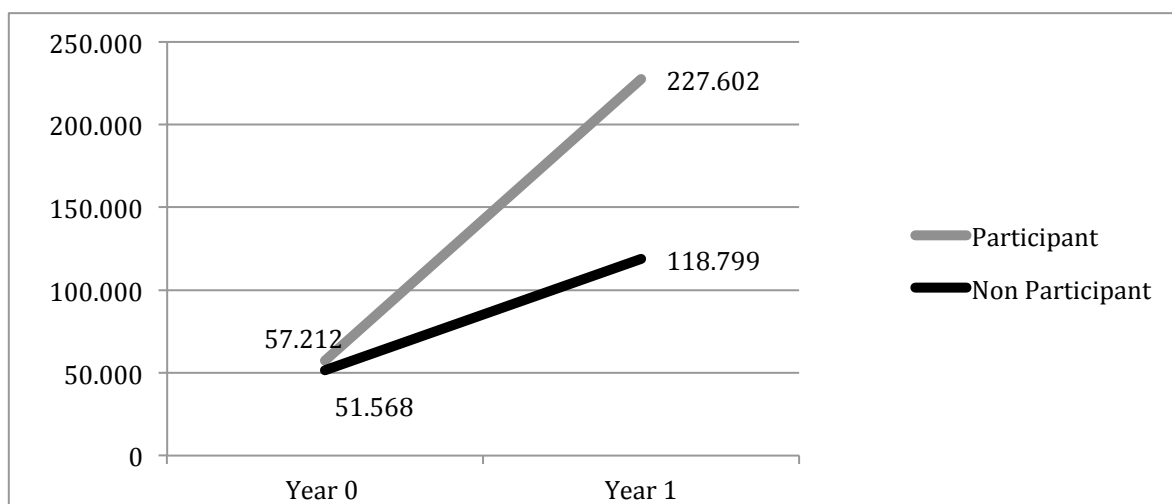
β_0 = Constant

$\beta_1 * Part$ = Difference between participants and non participants.

$\beta_2 * Year$ = Changes in time

$\beta_3 * Part * Year$ = The effect for participate in the program.

Figure 2: Differences between participants and Non-participants.



Source: Author, Empleo en Accion Survey.

Thereby, the net gains measured by the equation will be given by the differences between the gains of participants and the non participants, in this case instrumented by the Beneficiaries. as present the Figure 2, where the participants and non participants have the similar level of earnings (time= 0), but the participants (individuals exposed to treatment)

increase their income in 170,390 pesos while the non participants had and increment of 67,231 (time=1) Figure 2. Then, after subtract the differences between both changes, is possible to see that the net gains in terms of earning produced by the program was 103,159 pesos in average. Which represents an increment in terms of income at 1% of significance Table 4.

Table 4: Diff-Diff regression

	(1) OLS	(2) IV
Year	69,020*** (4,633)	67,231*** (5,353)
Participant	-3,852 (4,573)	5,644 (6,002)
Year * Participant	99,318*** (6,513)	103,159*** (8,389)
Constant	56,438*** (3,275)	51,568*** (3,835)
Observations	8,665	8,665
R-squared	0.168	0.167
chi2	.	1672

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

However, after compare the net income gains with the wage obtained in the program 180,000 pesos is possible to see that there is a lose of income that represent the 43%⁷ of the salary paid by the program. Which could represent that the program could displace work or lose of opportunity in the labour market.

This result coincides with those presented by Chacaltana (2003) who evaluate the workfare program from Peru, who also found forgone income, even when the program also was designed to target poor people who come from unemployment. As well as the idea expressed by Jalan and Ravallion (2003), who argues that the Workfare program could produce forgone income. On the other hand the results also contradict the theoretical dynamic explained by Ravallion (1998) who argues that the part time workfare program

⁷ $\beta_3 - \text{Program's wage} \div \text{Program's wage}$. Where the program wage corresponds to 180.000 pesos and β_3 corresponds to The effect for participate in the program.

should not present forgone income, since the possibility to still looking for a job remain, and the experience gained in the program, also facilitate the incorporation into the labour market.

At the moment to disaggregate the net gains estimations, is possible to see that at the gender level, the women present a higher impact from the program, since they have an increment of 118,898 pesos while the men have 89,994 pesos Table 5. Having a forgone income for women of 34% and 52% for men of the salary paid for by the program. Which coincide with results presented for Gallasso and Ravallion (2003) and Chacaltana (2003) who found a higher increment in the women salaries, hence a lower forgone income. Explained by the idea that women probably have a lower opportunity cost in the labour market Ravallion (1998). Idea also supported by the study done by *DNP* report (2000), Henao and Parra (1998), which present evidence that women, experimented higher levels of unemployment, in comparison with the men during the 90s. Then, this fact could also explain the participation of women in this type of programs, which usually have more male labour force, due the characteristic of the projects that implies more physical task.

Table 5: Diff-Diff regression by gender

	(3) OLS Men	(4) IV Men	(5) OLS Women	(6) IV Women
Year	91,219*** (6,681)	89,989*** (7,821)	36,678*** (4,910)	35,139*** (5,564)
Participant	-9,662 (6,353)	3,145 (8,396)	-4,181 (5,229)	-3,636 (6,837)
Year * Participant	84,394*** (9,051)	86,994*** (11,720)	115,291*** (7,445)	118,898*** (9,572)
Constant	73,093*** (4,719)	66,028*** (5,608)	31,822*** (3,475)	31,581*** (3,981)
Observations	5,601	5,601	3,064	3,064
R-squared	0.159	0.157	0.244	0.243
chi2	.	1042	.	841.7

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The analysis has been done also taking into account the different ages of the participant in the program, since Ravallion (1998) support the idea that the forgone income increases while the age also increase. Then, based on this idea the research estimate the forgone

income for 3 different groups of ages, the first range of age is between 18 and 30 years, the second between 31 and 45 years and third, between 46 and 65.

Table 6: Diff-Diff regression by Age

	(7)	(8)	(9)	(10)
	OLS 18-30	IV 18-30	OLS 31-45	IV 31-45
Year	43,326*** (6,063)	41,137*** (6,996)	94,201*** (9,176)	92,208*** (10,578)
Participant	-19,684*** (5,906)	-11,793 (7,778)	4,394 (9,042)	14,732 (11,760)
Year * Participant	120,905*** (8,483)	125,643*** (10,878)	77,332*** (12,812)	81,359*** (16,410)
Constant	63,124*** (4,269)	59,001*** (5,022)	58,202*** (6,495)	52,869*** (7,565)
Observations	3,711	3,711	3,312	3,312
R-squared	0.194	0.193	0.135	0.134
chi2	.	830.2	.	507.4

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The estimation presented in the Table 6 allows to see that the program produce a higher increment for the participants who are in the younger range of ages (18 – 30 years) with an average increment of 125,643 pesos at 1% of significance. The second group with high increment are those who are between 46 and 65 year with an average impact of 96,186 pesos at 1% of significance, Table 7. Thereby, the people who are in the range between 31 and 45 have the lower increment, since the average impact from participate in the program is 81,359 pesos, also at 1% of significance.

Therefore, as is expected the younger groups of participants have the lower forgone income, which corresponds to the 30% of income paid by the program. The results displayed, fit with the ideas expressed before by the authors, since the opportunity cost faced by younger population is lower due the lack of experience of been employed before Ravallion (1998). The results also coincide with Jalan and Ravallion (2003) who also estimate the benefit of the Workfare program from Argentina, founding that the forgone income is lower for the younger proportion of the population treated, presenting higher income net gains, probably because the low level of expertise, which represent not only a

higher probability to participate in the program if not also a lower opportunity cost. Idea also supported by DNP report (2000), Henao and Parra (1998)), Tenjo and Ribero (1998) who express that due the crisis and the lack of experience, as also happen with the women the younger people started to get involved in the labour market and try to participate more actively in the labour market in order to compensate the loses of income due to the crisis. Then, it made that they were probably more willing to join the program as an option to compensate this loses of income in the household.

Table 7: Diff-Diff regression by Age

	(11)	(12)
	OLS 46-65	IV 46-65
Year	82,119*** (8,735)	80,637*** (10,112)
Participant	14,287 (9,029)	24,442** (11,961)
Year * Participant	92,855*** (12,757)	96,186*** (16,756)
Constant	40,066*** (6,205)	35,271*** (7,226)
Observations	1,444	1,444
R-squared	0.269	0.268
chi2	.	497.0

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

On the other hand, those who are in the range between 31 and 45 have a lower increment compared with the others groups, since the program produce an average increment of 81,359 pesos. Having a forgone income of 55%. It could be explained by the idea that the individual within this range face a higher opportunity cost joining the program. Probably, since they are in a productive age where they should have a higher labour experience, compare with the younger group, which could facilitate the integration into the formal labour market and obtain a full time job. As also highlight Galasso and Ravallion (2003) who report forgone income for those participant who had a previous experience working. Then, the program could displace work since the forgone income reported for this group corresponds to the 55% of salary paid by the program. Jacobson and Petta (2000) also support the idea that those who have more labour experience could get involved easily in the formal labour market, then the workfare program could represent a lose of income for

them. Finally those who are between 45-65 year also present forgone incomes, which is the 47% of the salary paid for the program, which could be explained by the large period of unemployment faced by this groups, that makes then to have a lower opportunity cost compare with the range of year analysed before, Tenjo and Ribero (1998)

5. Caveats

The results presented before, should be interpreted bearing in mind the following caveats:

- 1- The Differences in the implementation of the program vary from priority and not priority areas, since the priority areas present a better project monitoring and control system, which was reflected in a more randomized proses at the moment to select the program`s beneficiaries, in comparison with the no priority areas. Then the results could be bias due to the not completely randomization of the program, at the moment that was implemented.
- 2- Due to the uncertainty generated by the delays at the moment to start the projects, some people selected as a beneficiaries drop the program, founding other job. Then, those who were non-beneficiaries at the beginning became beneficiaries. And finally the program produce a cross effect where those who were chosen as beneficiaries finally did not participate and those who were chosen as a non-beneficiaries did it. Then, the characteristics of those who finally participate probably are different for those who initially were chosen as beneficiaries. Hence, due to this fact, the Instrument Variable was performed, in order to obtain a lower bias impact of the program, and then estimate the diff-diff.

However, this method has several difficulties. First, the efficiency of the estimation is less and hence the estimation errors are greater than those obtained without the use of instrumental variables and second, although it is possible to correct for selection bias, this correction will always be partial. On the other hand, however, is

more consistent with the true population values, as it corrects for selection bias. for that reason the research present both regression.

- 3 As was explained before the projects from the region of San Vicente del Caguan was excluded from the study, since the DNP report several anomalies in the implementation, control of illegals group in the area and the presence of illegals groups (guerrillas) in the projects. Hence, due to this, the study left a population that could change the program impact and to know what would have happened if the region were not excluded. That is to say the average impact of the program could be different.

6. Conclusions

The following section will try to summarise the main finding of this research and provide some policy implication for further programs design where the main objective of the program was estimate the net earning gains generated by the program and then the possible forgone income that could be produced by the participation in the program.

The study tried to prove the idea that even when the program offers a part time job, which was supposed to do not displace work for those who participate, since the possibility to still looking for a job remained possible to do. However, since there are some workers who face some relatively low probabilities of finding full or part time job, even having available the full time to do it Gueron (1990), Find more attractive the salaries offered under the program and given the high unemployment rate of the country, and since the poorer proportion of the population tend to have a high probability of being unemployed, was reasonable to assume that the Participants will face a low probability to find a job. However due to the economic recovery started in 2003 the research expected a high forgone income for participants.

Then based on Instrumental Variables, to correct some selection bias due to problem in the selection proses and the implementation of the program, the diff-diff was estimated,

obtaining heterogeneous results, where the program produce an average increment for those who participate of 103,159 pesos at 1% of significance. Representing a forgone income of 43% approximately, which could confirm the idea that the program may displace work or loses of opportunity in the labour market, probably because at the moment to join the program the macroeconomic environment was different, since the economy start to experiment positive growth rate. Hence, once they start to participate in the program, probably the economic recovery expand the possibility to get a full time job in the formal labour market, which implied a high opportunity cost.

In addition the estimation was also done by gender and age, since was expected to have a higher increment for those who are young or women, due the opportunity cost faced by these groups may be lower. Then the estimation confirms the idea, since the younger participants, between 18 and 30 years old, present the higher average increment produced by the program, 125,643 pesos at 1% of significance, having a forgone income of the 30% of the salary paid by the program. While the participants who were between 31 and 45 years old face the lower increment 81,359 pesos. Having a 55% of forgone income due to participate in the program. Probably because their opportunity cost of participate in the program is much higher.

Finally, At gender level women also displayed a higher impact from participate in the program, which produce an average increment of 118,898 pesos, while the men have 89,994 pesos, representing a forgone income for women of 34% and 52% for men of the salary paid for by the program. Confirming the idea that this type of program produce more benefit for women in comparison with men, due to the low opportunity cost faced by then.

6.1 Policy implications

1. For futures Workfare program designs the central government should have greater centralization and control at the moment to implement and to monitor the programs. Due to the particular institutional weakness in the country, especially during the 90s and early 2000, which makes difficult to delegate the responsibility to municipal government and

other agencies that could wrongly implement the program and not completely achieving the objectives.

2. The Program seems to represent a high average forgone income for those who take part in the program, probably because the economic recovery that experienced the country during the end of the 2003 and 2004 may represent a loss of opportunity, in terms of to get involved in a full time job for a longer period of time. However, is necessary to bear in mind that the impact measure by this study is a short-term impact. Then, probably the program could improve employability, for participants, once the program will finish, since the participants may face a better labour market opportunities, which additional to the experiences gained in the program could be easier to get involved in the formal labour market and overcome unemployment.

3. The program shows that the greatest impact, in terms of earnings, is among young people and women, who during the crisis, were among the most vulnerable populations in employment terminus. Then, for future program could put more emphasis in generate more employment for these two groups. Since the program could represent a high opportunity cost for others groups that have a higher work experience and therefore more facility get in to the labour market.

4. Finally, may be interesting to know what would have happen in the municipalities where the guerrillas have a major presence (like San Vicente del Caguan) and possibly where there are fewer options for formal employment, reducing the opportunity cost from participate in the program, resulting in a lower forgone income. Since one of the main discussion in this regions is that the illegals groups as the guerrillas have a higher control due the no presence of the State. Then this type of programs could represent a great opportunity to increase the presence of the State and get back the control of some areas. At the same time, it could be an option for those who live in this region and have as a main option to work the for illegals crops.

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Annex

Annex I: Comparison between Beneficiaries and Non Beneficiaries

Beneficiaries vs Non Beneficiaries					
Variable	Non beneficiaries	Beneficiaries	Diff	P-Value	
	n= 2,133	2276			
Age	35	35%	11%	0.77	
Gender	60%	70%	10%	0	***
Married	22%	24%	3%	0.034	**
Single	25%	25%	0%	0.779	
Head of household	45%	53%	8%	0	***
Spouse of Head	20%	15%	-5%	0	***
Son of head	26%	25%	-1%	0.693	
No education	8%	11%	3%	0.004	***
Incomplete primary	28%	30%	2%	0.165	
Complete primary	23%	23%	-1%	0.691	
Incomplete secondary	24%	21%	-3%	0.013	**
Incomplete secondary	14%	14%	-1%	0.49	
Higher education	2%	2%	0%	0.693	
Main material of interior interior (ground)	17%	22%	5%	0	***
Main material of interior interior (cement)	62%	60%	-3%	0.055	**
Main material of external wall (wood)	8%	10%	3%	0.004	***
Main material of external wall (blocks)	74%	66%	-8%	0	***
1 room house	17%	1%	1%	0.265	
2 room house	23%	27%	5%	0	***
3 room house	23%	27%	5%	0	***
4 room house	20%	18%	-2%	0.141	
Vulnerability: affected by violence	10%	8%	-2%	0.025	**
Vulnerability: affected by unemployment	29%	24%	-5%	0.001	***
Health impairments for activities	15%	12%	-3%	0.001	***
Work in 2001	74%	79%	5%	0	***
Work experience before	13%	8%	-5%	0.259	
Earnings 2000	193,626.6	170,693.7	-229,329	0.127	

Significance: *** p<0.01, **p<0.05, * p<0.1

Source: Author. Empleo en Accion Survey