

Impact of the Access to Public Child Care on Employment, Education Attendance, and Time Spent on Unpaid Domestic Work of Women in Costa Rica*

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Abstract

This paper evaluates the effect of Costa Rica's government childcare programs on woman's time use. The two main childcare programs -CENCINAI and IMAS- are evaluated regarding their impact on labor force outcomes, school attendance, and unpaid domestic work. The idea is simple, childcare programs free time for women to spend in other activities rather than taking care of their children. This time can be used to work, study or do unpaid domestic work.

The results suggest that CENCINAI does not have a positive effect on labor market participation (neither at the intensive nor the extensive margin) while it has a positive effect on school attendance and domestic work. On the contrary, IMAS seems to have a positive effect on labor market outcomes and school attendance but not on domestic work.

These results might be explained by the weights poverty have in determining who is eligible for the benefits in each program. CENCINAI consider few variables giving more weight to whether the individual is poor. Therefore, if a current beneficiary finds a job that moves her out of poverty, chances are that she is not eligible for the benefits anymore. This creates an incentive to dedicate free time to other activities rather to participate in the labor market. Since IMAS consider a wider range of variables this negative effect might be mitigated.

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1 Introduction

Costa Rica is an upper middle income country located in Central America with about 4.9 million inhabitants (INEC, *n.d.*) and a GDP of around 74 billion international dollars in 2016 (World Bank, *n.d.*). Since the nineties, Costa Rica has suffered a stubborn poverty rate that affects about a fifth of their population (see figure 17). Even more, as it is common in the rest of Latin America, women are over-represented among the poor (Trejos, 2011).

Indeed, female-headed households are more likely to be poor. In 2015, only 19% of male-headed households were poor while 26% of female-headed households were. Moreover, in the same year, 43.5% of all poor households were female-headed (Estado de la Nación, 2016). This figure is the result of an increasing trend starting in 1997, when the share of poor households headed by women was 27% (see figure 18). This trend can be in part explained by a low incorporation of women into the labor market, and when incorporated the influence of part-time jobs and lower wages compared to those of men (Robalino, Trejos and Paredes, 2016). The rate of female labor force participation (FLFP) has increased by only 10 percentage points from 1990 to 2016, when it was 38% (see figure 19). This FLFP is lower than the average of Latin America and the Caribbean (LAC) and only greater than 6 out of 25 countries of the region (Mateo Díaz and Rodríguez-Chamussy, 2016).

According to Trejos (2011) women not only have the odds of falling into poverty against them, but -when poor- they are more vulnerable and face more disadvantages than men. For instance, a greater number of children and elders are economically and emotionally dependent on them; women also have lower levels of education and technical training that limit their access to better jobs. The labor market is segmented by gender, offering unskilled, temporary, and -in general- jobs with less favorable conditions to women. They also face limited access to productive resources (like land and credit) and unequal hiring conditions along with a significant wage gap.

In sum, female-headed households are more likely to be poor. Women also face harder job market conditions in part due to their level of education and technical skills and, when in home -as oppose to men- women have to use more of their time taking care of children and elders. Against these disadvantages, child care programs aim to offer a female head of household the possibility of working while her children are being taken care of. Even more, although their

main objective is to fight poverty through increasing labor force participation of women, these programs also free up time that can be used to increase the level of education and/or change the allocation of time in favor of other activities such as taking care of elders. The effect of this type of program on labor market outcomes has been widely studied in other countries but not in Costa Rica. More importantly, the effect of these programs on the level of education and reallocation of time has not been widely explored yet.

Indeed, child care programs are considered key for both FLFP and childhood development (Chioda, 2016; Mateo Díaz and Rodríguez-Chamussy, 2016). Costa Rica has invested in public child care services to improve both indicators, but has not accompanied those efforts with the evaluation required. There is not enough evidence about the quality of the service provided, nor the impact the Costa Rican public program (called *Red de Cuido Infantil* in Spanish or Child Care Network from now on) is having on children and families that are beneficiaries.

It is the purpose of this research to start filling that gap of the required impact evaluation of the Costa Rican program and to contribute to the empirical evidence among developing countries, especially that of Central American countries that is more scarce when compared to larger Latin American economies and developed countries. This research focuses on the impact of the program on women that belong to households who are beneficiaries of the public Child Care Network, with emphasis on their outputs in the labor market, their education attendance and their time use decisions regarding non-paid domestic work. Thus, the question: Does having access to public child care increase the education attendance, employment, and time spent on unpaid domestic work of women in Costa Rica? will be the guide of this paper.

The rest of the paper proceeds as follows. The next section reviews some of the literature in existence about the topic. The third section describes the child care program specific to Costa Rica. The fourth section depicts the methodology proposed, describing the data available and the empirical model. Sections fifth to ninth present the results. The last section concludes.

2 Literature Review

The impact of a child care program depends on its effective use, which at the same time depends on household decisions about whether or not to send their kids to the center, and parents' decisions about what to do with their now 'new free time'. Which of these two decisions is made first is difficult to establish. Moreover, theoretical models on households dynamics point out that utility maximization within a household is not merely a sum of individual utilities but a more complex collective utility maximization where all members' interests are considered when deciding how to allocate resources (Lord, 2002). This logic applies to the decision of whether one or both partners -in two-partner households- decide to participate in the labor market, as well as in the decision about whether or not to send their kids to a child care center, to an informal/family-provided care, or to have them stay at home.

For instance, some studies have found that part of the demand for -new- formal child care appears to come from women who have already made the decision to participate in the labor market and who are only readjusting their existing child care arrangements in favor of a cheaper form of formal care (Chioda, 2016). Moreover, child care programs targeted to poor people can include perverse incentives when including unemployment as an important variable to grant access, since it discourages parents to participate in the labor market if they have to remain unemployed to preserve the public benefit (Estado de la Nación, 2017).

Child care programs are present in both developed and developing countries¹, but the state of their evaluation is not the same. According to Mateo Díaz and Rodríguez-Chamussy (2016), the evidence from both developed and developing countries reveals that access to childcare is associated with higher female labor force participation (FLFP). However, for Chioda (2016), when this evidence is scrutinized, the credible empirical evidence of access to day-care facilities and FLFP is in the best cases inconclusive if not contradictory, and she finds the evidence from developed nations to be richer than that from developing countries.

Among developed countries, Cascio (2009) studies the case of an implicit kindergarten subsidy

¹Examples of developing countries with public child care provision are Mexico, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Colombia, Bolivia, Ecuador, Chile, Uruguay, Brazil, Dominican Republic; while some developed countries with public provision are Canada, Finland, France, Germany, Japan, The Netherlands, Norway, Sweden, and the United Kingdom. However, notice that this is not an exhaustive list but an exemplification.

in the United States and finds a positive effect only for single women whose youngest child is at least five years old, but no effect for married women or single women with younger children. But, as stated by Mateo Díaz and Rodríguez-Chamussy (2016), actually much of the literature focuses on the relationship between the cost of childcare and FLFP, testing the hypothesis that the more affordable the service is, the more it is used and the higher the probability that women participate in the labor market. For developed countries they found that evidence shows that reductions in the costs of child care and increases in its availability boost FLFP (Anderson and Levine (2000) and Blau and Currie (2006) for the United States; Gustafsson and Stafford (1992) for Sweden; Lokshin (2000), and Fong and Lokshin (2000) for Rumania; Baker, Gruber, and Milligan (2008) for Quebec-Canada; and Simonsen (2010) for Denmark)

Among developing countries, the growing evidence on the relationship between child care provision and FLFP in Latin America has taken advantage of an increasing number of evaluation of large-scale early childhood development programs. These evaluations have documented benefits of early childhood development on children's outcomes, but they also show a more subtle picture of their indirect effects on FLFP (Chioda, 2016). In particular, *"the evidence from experimental or quasi-experimental interventions thus challenges the widely held belief that lack of access to formal child care is the primary barrier to maternal employment across a number of LAC countries, but supports the argument that improved access relaxes a constraint on those mothers already in the labor force by enabling them to work more hours"* (Chioda, 2016; p.198)

Furthermore, Hallman *et al* (2005) studies the effect of formal childcare price reductions in a developing country: Guatemala. This study finds that reductions in prices have a significant effect on working hours (i.e the intensive margin) but an insignificant effect on mother's labor force participation (i.e the extensive margin). This is, reductions in formal childcare prices might increase the number of paid work hours for women but they might not have an effect on entry into the labor force.

On contrast, Paes de Barros *et al* (2011) find a significant impact of access to free child care on the extensive margin, in Brazil. According to this study, employment and labor force participation increase while unemployment decreases as access to free child care expands.

Berlinski, Galiani and McEwan (2011), using a regression discontinuity design, evaluated the

effect of preschool attendance on maternal labor outcome of a more general educational program in Argentina. Their estimates suggest that, on average, 13 mothers start to work for every 100 youngest children in the household that start preschool. Furthermore, mothers are 19.1 percentage points more likely to work for more than 20 hours a week (i.e., more time than their children spend in school) and to work, on average, 7.8 more hours per week as a consequence of their youngest offspring attending preschool. They find no effect of preschool attendance on maternal labor outcomes for children who are not the youngest in the household. But find persistent employment effects at the point of transition from kindergarten to primary school, which according to the authors might be explained by the fact that finding jobs takes time or by a mother's decision to work once the youngest child transitions to primary school.

Contreras, Puentes and Bravo (2012) highlight two other important factors that could determine the use of the child care facilities and the consequent incorporation into the labor market of women: the distance to the closest daycare center to either their home or place of work, and whether the center's hours of operation match the labor hours. Analyzing the Chilean case, the authors found both variables to be positively correlated with female labor participation. Moreover, they argue that the absence of effect on FLFP among low-income women studied in Chile previously (see for example, Medrano (2009), and Encina and Martínez (2009)) could be due to the fact that the new centers are not located near the potential work places or the women's home, or that the attending hour do not allow women to participate full time or even part time.

Finally, *"increasing access to childcare improves the stock of human capital (by helping working families) and the flow of human capital (by fostering early childhood development). This strong intergenerational feature of childcare policies is particularly important for vulnerable households. Enabling parents to work (or study) and young children to benefit from early education has the potential to close gaps in school achievement, employment, and earnings between the poor and nonpoor"*(Mateo Díaz and Rodríguez-Chamussy, 2016, p.43). But for these benefits to be seen we first need to ensure access to child care program and high take-up rates. Low take-up rates may reflect low quality or lack of service characteristics crucial for families, mismatches between the service features of particular interventions and the needs of working mothers -convenient location and opening times-, and some others factors that matter to families, about

which more research is still needed (Mateo Díaz and Rodríguez-Chamussy, 2016)

3 The Costa Rican Child Care Network

Child care services are not a new social program in Costa Rica. Actually, the first child care program can be traced back to 1951 with the first Nutrition Center for children. The original goal of the program was to alleviate child malnutrition. During the seventies, child care and protection evolved into a more integral program driven by the National Directorate of Education Centers and Integral Child Attention Centers (CEN-CINAI National Directorate by its Spanish acronym). This program was developed on the premise that by taking care of their children, the mothers, most of whom are single parents, will have more time to dedicate to their studies, job training programs, or get into the labor market (Dirección Nacional de CEN-CINAI, *n.d.*).

In 2010, the government introduced the *Red de Cuido Infantil* (Child Care Network) program as a way to improve the scattered efforts in child care driven by different public and private national and local institutions. It is mainly financed by the Social Development Fund (FODESAF, by its Spanish acronym) and executed by three institutions: 1. The Mixed Institute of Social Aid (IMAS, by its Spanish acronym), 2. The CEN-CINAI a branch of the Ministry of Health, and 3. the National Patronage of Children (PANI, by its Spanish acronym).

As of december 2016 the Child Care Network had 1,157 centers available, partial or totally financed by the government, to take care of around 52,000 children across the country². As shown in table 1, about half of the beneficiaries have been selected and are financed through the IMAS. Most of these IMAS beneficiaries are cared for in private centers (69%) and about a fifth in public daily care centers (CECUDI, by its Spanish acronym)³ The CEN CINAI takes care of about 41% of the beneficiaries and PANI is the one with the lowest coverage (PEN, 2017). There is a similar trend when geographic coverage is analyzed.

²There are out of the Network other 1,600 private centers that offer child care services in the country. Interviews: Araya, 2017 and Esquivel, 2017 in PEN, 2017

³CECUDI are child care centers built by the Municipalities with FODESAF funds in Municipal land, the center is administered by the Municipality which can offer the personnel provision in a public tender and the child fee is paid by the IMAS. This type of provision also allows the municipality to charge a fee while offering the service to families with payment capacity, however, this has not been a common practice among these families yet.

Table 1: Costa Rica: Child Care Beneficiaries by Executing Institution, 2016

	Care Alternatives	Beneficiaries	
		Absolute	Percentage
IMAS	656	27,197	52.11
<i>Municipal CECUDI</i>	59	5,341	19.64
<i>Private Child Care Centers</i>	386	18,841	69.28
<i>Community Homes</i>	193	2,324	8.55
<i>Asociación de Bienestar Social</i>	1	82	0.30
<i>Temporary Care (Casas de la Alegría)</i>	17	609	2.24
PANI	41	3,357	6.43
CEN CINAI	460	21,636	41.46
Total	1,157	52,190	100.00

Source: Estado de la Nación 2017, Costa Rica.

Although the Child Care Network is present in each of the 81 cantones⁴ of the country, the concentration of beneficiaries is not the same across them. According to the *Estado de la Nación* Report (2017) the greatest concentration of beneficiaries is in 19 of the 81 cantones where the three executing institutions are present, but these are mainly urban *cantones* and located in the Great Metropolitan Area (GAM, by its Spanish acronym). On the other hand, there are 52 *cantones* that together take care of 50% of the Network beneficiaries. This group of *cantones* have the presence of two of the main institutions, IMAS and CEN-CINAI.

Even though the Child Care Network was designed as a universal program, it runs as a selective program focused on children up to seven years old, with special emphasis on those under poverty conditions. In terms of effective coverage of the latter population, the *Estado de la Nación* Report (2017) affirms that the program has low coverage rates in most of the *cantones* and high coverage in the province of Guanacaste and the GAM. According to administrative data, 97% of the beneficiaries are poor, 81% belong to a female-headed household, only 41% come from a household whose breadwinner has permanent employment and, in 81% of the cases, the head of the household has incomplete secondary education or less. Despite this poverty targeting, the national data do not show a clear association between the coverage per *cantón*

⁴Cantones refer to the second greatest geographical and political division in Costa Rica, after provinces.

and the poverty rates (Estado de la Nación, 2017). In other words, most of the beneficiaries are poor but most of the resources invested are not in *cantones* with the highest poverty rates. Nevertheless, in terms of poverty alleviation, a priority attention to regions with high density of poor people, contrary to regions with high poverty rates that is relative to the population size, could be cornerstone.

3.1 Criteria of Access

As stated before, the Child Care Network is mainly financed by FODESAF. By FODESAF parameters and as it is established by law ⁵ all programs financed by this fund must select their beneficiaries according to their poverty status, measured by the national poverty line, defined and published every year by the Costa Rican National Institute of Statistics and Census (INEC, by its Spanish acronym). In practice, each institution has developed its own forms and poverty measures, as well as their criteria of access according to the program they offer and its population targeted.

3.1.1 CEN CINAI

The CEN CINAI National Directorate has developed a score system to classify families called Characterization of the Family Environment (known as CAF or *Caracterización del Ambiente Familiar*). The local centers of CEN-CINAI apply a form to the families who want to be beneficiaries of the Child Care Network. This form inquires about three great subjects: 1. Socio-economic environment, 2. Educational environment, and 3. Health condition of children in the household. Different weights are given to each subject, for instance, socio-economic environment can have a maximum of 50 points, educational environment 15 points, and health condition another 15 points maximum. Each subject includes specific questions with specific weights assigned to each question.

The socio-economic environment section asks about the family income and the kind of household. The poverty line is defined in accordance to the INEC parameters for urban and rural areas. A family is in extreme poverty if it is unable to afford a basic food basket. It is poor,

⁵*Ley 8783 de Desarrollo Social y Asignaciones Familiares* and *Ley 5662 y su reforma Ley 8783 de Desarrollo Social y Asignaciones Familiares*

but not extremely, if can afford more than that basic food basket but less than a basic food and services basket. Both poor and extremely poor families are classified as priority 1 and have access to child care services. If the kind of household is a single female-headed household, this adds points to the family score.

The educational environment section inquires about the educational level of the parents, the school attendance of the siblings and siblings' educational achievement (lag presence or not). Parents with incomplete secondary education or less, add points to the family score. The health condition section explores whether in the household are children younger than 2 years old who were born pre-term or underweight, children younger than 13 years old underweight, and/or children younger than 7 years old with a disability or growth delay. Any child with one of these conditions in the household will add points to the family score.

According to the score obtained, families are classified into three priorities: from Priority 1 being the most urgent of attention to Priority 3 the less. Notice that the poverty condition, measured by the family income, has the greatest weight to classify a family into priority 1. Moreover, most of the CEN CINAI beneficiaries (95% in 2016) belong to this group (Dirección Nacional de CEN CINAI, 2017). However, families in vulnerability or in social risk can also qualify to the program. A family will be vulnerable if they can afford the basic food and services basket but their income is less than 1.6 times the poverty line. Finally, a child will be considered in social risk when his/her family is not poor but presents a situation that is contrary to the supreme interests of his/her growth and development, these risks are classified into seven large groups namely: psycho-social risk, occupational social risk, risk due to difficulties in care, child's disability, risk in the context, adolescent mother, and lagged in growth, development and malnutrition. (FODESAF, 2017a)

3.1.2 IMAS

The IMAS has developed a score system to classify families as well, although a little bit more complicated than the one used by CEN CINAI in terms of the number of variables and the system of weights used. To be a beneficiary through the IMAS, the family must have filled a Social Information File (Ficha de Información Social, FIS by its Spanish acronym) by a social

worker of the institution. The FIS is a structured data collection instrument with 65 variables of socioeconomic, demographic and geographical type (FODESAF, 2017b). The family information is introduced in the Information System for Target Population (Sistema de Información para la Población Objetivo, SIPO by its Spanish acronym) that determines people's poverty level.

There are at least four basic steps that explain how the final scores per family are obtained:

1. Using data from National Household Surveys (ENAHU, by its Spanish acronym) the IMAS determines which variables are good enough to explain the poverty phenomena in Costa Rica. The model used or the criteria to select those variables is not public.
2. Using the variables from 1., and by Principal Components Analysis, they determine the weight each variable will have in determining the poverty level of the potential beneficiaries.
3. When the IMAS is evaluating a potential beneficiary, they use the family information gathered in the FIS and apply them the weights from 2., so they can get a single score per family.
4. According to this score, families are going to be classified into one of four different groups, that are broken in brackets, i.e., once you surpass the maximum cutoff (minimum of next group) of the group 1 you enter the group 2. Each of these groups defines the intensity of their poverty level according to their region (rural or urban) and classifies them by their priority of attention from priority 1, priority 2, vulnerable, to non-priority group. The non-priority group will not have access to child care services. In practice, the allocation of spots for the other three groups is based on first come, first served. Only in cases of limited resources and high demand some prioritization and/or limited attention system will be followed for the first three groups.

4 Methodology

The public child care services in Costa Rica are assigned through two different means-tested scores that classify families who apply to any of the two main executing public institutions. The family (i.e. the child) is accepted into the program if their score exceeds a certain cutoff point previously established by the institution. Among the variety of methods to evaluate the impact of public policies, the Regression Discontinuity (RD) research designs exploit precise knowledge of the rules determining treatment (Angrist and Pischke, 2009, p.521) and are especially used in cases of policies where *"the design [...] arises from administrative decisions, where the incentives*

for units to participate in a program are partly limited for reasons of resource constraints, and clear transparent rules rather than discretion by administrators are used for the allocation of these incentives" (Imbens and Lemieux, 2008, p.616)

More specific, as stated by Angrist and Pischke (2009), sharp RD is used when treatment status is a deterministic and discontinuous function of a covariate, x_i . For instance if

$$D_i = \begin{cases} 1 & \text{if } x > x_0 \\ 0 & \text{if } x \leq x_0 \end{cases} \quad (1)$$

where x_0 is a known threshold or cutoff. $D_i = 1$ when the person is treated, that means when the person receives the benefit of the public policy in this case, and $D_i = 0$ if not. This assignment mechanism is called a deterministic function of x_i because once we know x_i we know D_i . Also, treatment is a discontinuous function of x_i because no matter how close x_i gets to x_0 , treatment is unchanged until $x_i=x_0$.

But in the Costa Rican case, we observe errors of inclusion and exclusion, reason why we use $D_i = 1$ as observed in the data of effective use of the program, as we will see in the empirical model, to account for those effectively treated by the program. Even when a family score is enough to access the program, we can observe in the data that they might not be beneficiaries. This is due to the fact that these social programs are offered by the government to potential beneficiaries, but it is people's responsibility to claim them to the executing institutions. We will observe, for the CEN CINAI that once the priority 1 threshold is surpassed the probability of participating in the program significantly increases, but does not jump from zero to one, because of the potential beneficiaries that are not covered by the program yet. The IMAS case is similar, with four groups and different thresholds according to the area of residence, rural or urban. More specific,

$$G_i = \begin{cases} 1 & \text{if } 0 \leq x < c_1 \\ 2 & \text{if } c_1 \leq x < c_2 \\ 3 & \text{if } c_2 \leq x < c_3 \\ 4 & \text{if } c_3 \leq x \end{cases} \quad (2)$$

where G_i is the priority group, x is the family score, and c_i are the limits of the brackets that define the different priority groups. It is important to notice that c_i will be different for

urban and rural areas. We will focus on the cutoff between the groups 3 and 4, where the probability of treatment changes, since group 4 should not receive the program according to the IMAS standards. Among people classified in groups 1, 2, and 3 we will observe an increase in the probability of receiving the program, but again this jump will not be from zero to one because of the potential beneficiaries who the IMAS is not covering yet.

In short, *"the basic idea behind the RD design is that assignment to the treatment is determined, either completely or partly, by the value of a predictor (the covariate x_i) being on either side of a fixed threshold. This predictor may itself be associated with the potential outcomes, but this association is assumed to be smooth, and so any discontinuity of the conditional distribution (or of a feature of this conditional distribution such as the conditional expectation) of the outcome as a function of this covariate at the cutoff value is interpreted as evidence of a causal effect of the treatment"* (Imbens and Lemieux, 2008, p.616)

4.1 Model

The Regression Discontinuity Design allows for the impact of a treatment to be noticed at first sight graphically, but formalized later in a regression of the type

$$Y_i = \alpha + \tau D_i + \beta x_i + \tilde{\beta} D_i x_i + \varepsilon_i \tag{3}$$

where x_i is the score for each individual according to the program criteria of access. D_i is the regressor of interest that is correlated to x_i , and takes the value of one (=1) when the individual is treated and a value of zero (=0) when is not. D_i is deterministically related to the threshold-crossing rule, $x_i > x_0$.

This regression is estimated on a local neighborhood of the cutoff point where the observations to the both sides are expected to be similar. The optimal bandwidth is chosen based on Imbens and Kalyanaraman (2012). Finally, for robustness check some control variables are included. In particular two types of variables are included: 1. controls correlated with the outcome of interest but not with the score, and 2. controls that although could be correlated with the score are still correlated with the outcome of interest and do not want to be omitted.

4.2 Data and Sample

The National Households Survey (ENAHO, by its Spanish acronym) is a nationally representative survey conducted annually since 2010 by the Costa Rican National Institute of Statistics and Census (INEC, by its Spanish acronym). The survey, implemented in July, asks one respondent for information on all individuals in the household regarding socio-demographic characteristics such as education, employment status, hours worked in unpaid labor, time used in other activities, and access to social programs provided by the government, including cash transfers and in kind provisions, among other information related to the dwelling itself.

Regarding the information of social programs, it is possible to identify if any member of the household is a beneficiary of the child care services provided by the CEN-CINAI (since 2010) or by the IMAS (since 2015). More specific, the survey inquires if any member of the household has received from the IMAS any aid from the Child Care Network, the child care services provided the whole day by the CEN-CINAI or the feeding service provided by the CEN-CINAI where children also stay at the center mid-day. As shown in table 2, I will call IMAS the first service, where the IMAS pays for the fee required for the attention of the child. CEN-CINAI full time will refer to the service of child care where children stay all-day at the center, and CEN-CINAI part-time when they stay mid-day. In the three cases meals are offered to children. Table 2 also shows the size of the cross-sectional sample for each year, although for the purpose of this paper only the most recent data available (2016) is used. The survey does not identify the beneficiaries of the Child Care Network that are catered by the PANI, but as seen before these are a minority, so this is not expected to affect the results.

Moreover, the child care services financed by the IMAS are those who belong to the program called Child Care Network, while the CEN CINAI services include those plus the long-standing services. In the latter case, distinguishing whether a beneficiary is receiving child care services of the Child Care Network or the regular services of the CEN CINAI is not only difficult for the people but indistinguishable in the data of the ENAHO. Then, when using the ENAHO data what we are evaluating is the public provision of child care services rather than only the Child Care Network program.

Table 2: Costa Rica: Public Child Care Services Sample from the ENAHO, 2010-2016

Year	IMAS		CEN CINAI full time		CEN CINAI part time		TOTAL	
	sample	weighted	sample	weighted	sample	weighted	sample	weighted
2010	n.a.	n.a.	84	8,526	116	10,333	200	18,859
2011	n.a.	n.a.	99	10,195	133	12,903	232	23,098
2012	n.a.	n.a.	102	11,578	105	8,192	207	19,770
2013	n.a.	n.a.	139	12,427	128	10,723	267	23,150
2014	n.a.	n.a.	99	9,685	126	12,203	225	21,888
2015	84	11,048	128	16,395	104	12,972	316	40,415
2016	99	13,090	125	16,737	164	20,321	388	50,148

Source: Own elaboration with ENAHO data.

5 Results: Scores Estimates

As shown in section 3, the access to the Costa Rican public child care services is determined by two different scores that has been established by the executing institutions, namely: CENCINAI Directorate and IMAS. Both scores are here estimated with data from the ENAHO 2016 and presented in figures 1 and 2. Each graph presents the corresponding score against the proportion of households with at least one child receiving the child care services of the CENCINAI or IMAS, respectively. The vertical line represents the cutoff from which families qualify to be beneficiaries of the program. For the IMAS score, called SIPO in the graph, the cutoff varies for rural and urban zones, but the ENAHO does not have enough observations to be representative of the program in rural areas, and that is the reason why we are only presenting results for the urban areas. In the CENCINAI case we are presenting two cutoffs, at 20 and 36 points. Observations to the right of the 20 (inclusive) are potential beneficiaries. While in the IMAS case are those to the left of the vertical line. In both cases, the probability of having access to the program increases 'after' the cutoff point, suggesting that the scores here are well estimated. Although the change is more subtle in the IMAS when the observations come closer to the cutoff, in the CENCINAI the 'jump' is stronger at the 20 points cutoff, that suggests the cutoff to use in the regressions later on.

Figure 1

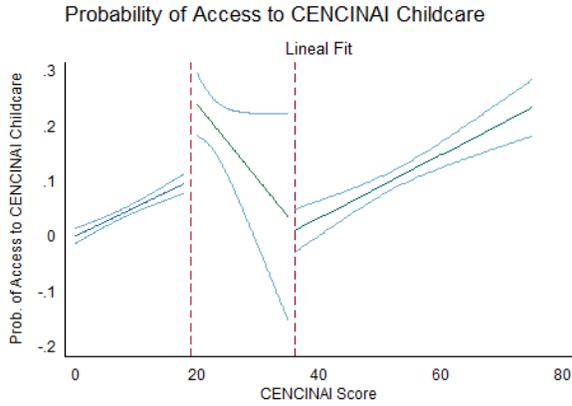
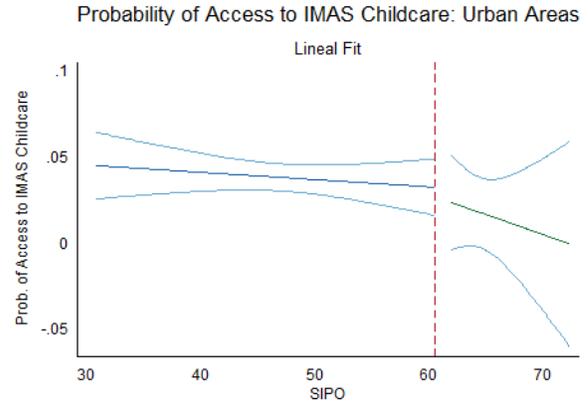


Figure 2



Source: Own elaboration with ENAHO data.

6 Results: Access to Child Care

As stated at the beginning of the literature review, for a program to have an impact it has to be effectively used by the families. The public provision aims to make it more accessible, especially for families with income constraints to afford child care in the private market. In this sense, the first question to answer would be: Is the Costa Rican public provision of child care increasing the access (or effective use) to child care?

In order to check if that is the case, the sample is restricted to children under seven years old. Includes children attending public and private centers, as well as those not attending any child care or educational center. Only for these graphs when the CEN CINAI is analyzed, IMAS current beneficiaries are included. Likewise, when IMAS is analyzed, CEN CINAI current beneficiaries are in the sample. When the CEN CINAI score is on the x-axis, the area of treatment is to the right of the cutoff, while when the SIPO -IMAS score- is on the x-axis, the treatment area is to the left of the threshold.

Figure 3

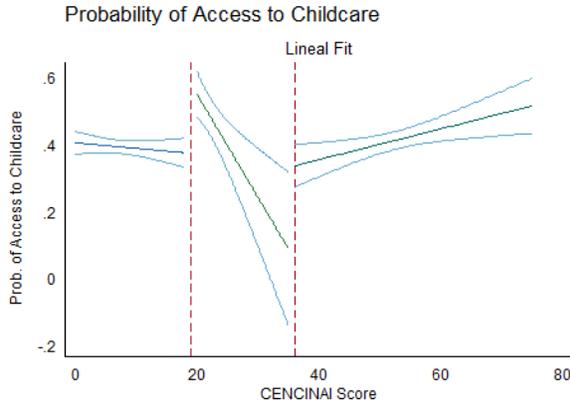
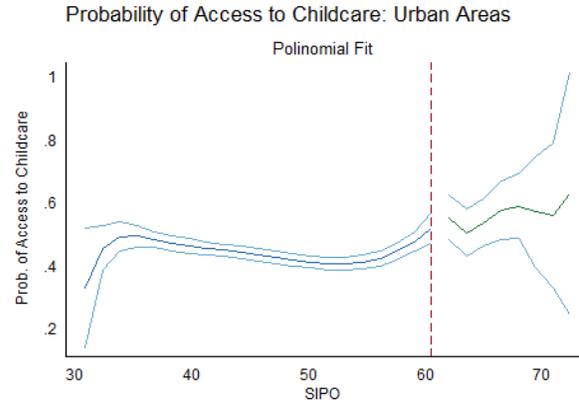


Figure 4



Source: Own elaboration with ENAHO data.

The observed probability is defined as the ratio of cases that satisfies the condition (make use of child care) over the total of observations (sample) for each score level. The results on CEN CINAI (figure 3) show a discontinuity at the lowest cutoff point. Those observations with scores higher than 20 points (figure 3) exhibit higher probabilities of access to child care than the ones below the cutoff. Although it starts decreasing when approaching the next cutoff, after surpassing the 36 cutoff the probability starts increasing again. These results suggest that once families have access to the services of CEN CINAI, the probability of access child care services increases. In other words, the public provision of child care through the CEN CINAI centers might have some effect on increasing the use of child care among families.

The data show not a clear effect in the IMAS case (figure 4) of an increase of use of child care services when the SIPO cutoff is surpassed (lower than 60 points). The picture does not change substantially if the CEN CINAI beneficiaries are taken out of the sample either. Comparing figures 3 through 4 suggests that the child care services provided through the IMAS are not having the same impact on access that the CEN CINAI showed, and question whether the program can have an impact on other variables if it is not increasing the effective use of child care services in the country.

7 Results: The Impact on Employment

Regarding the impact of the child care services on employment two main effects are of interest: the extensive and intensive margin. The extensive margin refers to women decision to get into the labor market, while the intensive margin refers to the number of hours she decides to dedicate to paid work in the labor market. First, we look at the probability of labor force participation of women. Second, we look at the number of hours worked by employed women of those households.

For the extensive margin, the sample is restricted to women of working age (from 15 to 65 years old), who belong to households where there is at least one child who is six years old or less (potential consumer of child care). The observed probability of labor force participation is defined as the proportion of women employed or unemployed over the total number of women of working age, for each level of the score.

For the intensive margin, the sample is restricted to women in the labor force, i.e. employed or unemployed from 15 to 65 years old and whom belong to households with presence of a minor of 6 years old or younger. Then the mean of hours worked by women at every level of the score (figures 7 and 8) is estimated. The proportion of women working full time -interpreted as those who reported to be working 40 or more hours per week- is also estimated (see figures 9 and 10).

Figure 5

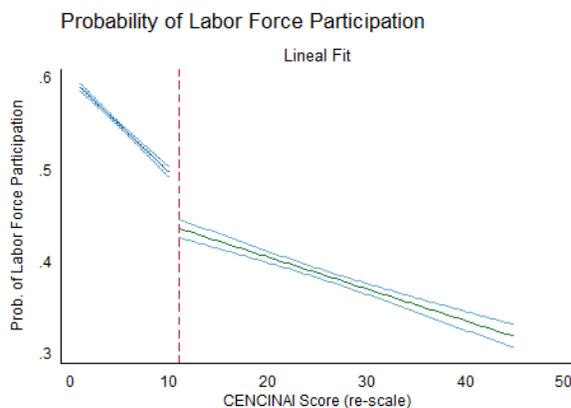
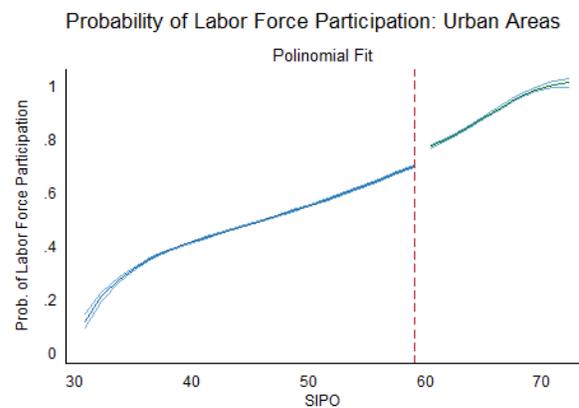


Figure 6



Source: Own elaboration with ENAHO data.

Table 3: Costa Rica: Public Child Care Services Impact on Labor Force Participation

	CENCINAI															
	Urban								Rural							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
D (=1)	-0.0364*** (0.00266)	-0.0462*** (0.00479)	-0.0506*** (0.00464)	-0.0219*** (0.00444)	-0.0445*** (0.00336)	0.0113* (0.00586)	0.00380 (0.00568)	0.0462*** (0.00543)	-0.0718*** (0.00611)	-0.197*** (0.0141)	-0.113*** (0.0140)	-0.0237* (0.0140)	0.118*** (0.00628)	0.346*** (0.0766)	-0.553*** (0.0685)	-0.381*** (0.0669)
Score	-0.00400*** (3.41e-05)	-0.00403*** (3.54e-05)	-0.00295*** (3.68e-05)	-0.00261*** (4.00e-05)	-0.00380*** (4.63e-05)	-0.00366*** (4.79e-05)	-0.00266*** (4.91e-05)	-0.00142*** (5.33e-05)	-0.00449*** (0.000185)	-0.00490*** (0.000191)	-0.00142*** (0.000195)	0.00296*** (0.000214)	0.0198*** (0.000211)	0.0199*** (0.000224)	0.0145*** (0.000224)	0.00717*** (0.000290)
D*Score	0.000326** (0.000130)	0.000326** (0.000124)	0.000162 (0.000124)	-0.000137 (0.000120)	-0.000137 (0.000120)	-0.000137 (0.000187)	-0.000195*** (0.000177)	-0.00232*** (0.000176)	0.00808*** (0.000829)	0.00808*** (0.000829)	0.00138* (0.000807)	-0.00316*** (0.000783)	-0.00418*** (0.00138)	-0.00418*** (0.00138)	0.0115*** (0.00123)	0.00748*** (0.00120)
age	0.0556*** (0.000300)	0.0556*** (0.000300)	0.0708*** (0.000300)	0.0708*** (0.000315)	0.0708*** (0.000315)	0.0653*** (0.000370)	0.0653*** (0.000390)	0.0653*** (0.000390)	0.0592*** (0.000711)	0.0592*** (0.000711)	0.0592*** (0.000711)	0.0769*** (0.000739)	0.0640*** (0.000567)	0.0640*** (0.000567)	0.0702*** (0.000592)	0.0702*** (0.000592)
age squared	-0.000706*** (4.10e-06)	-0.000706*** (4.10e-06)	-0.000891*** (4.25e-06)	-0.000891*** (4.25e-06)	-0.000891*** (4.25e-06)	-0.000731*** (4.98e-06)	-0.000813*** (5.19e-06)	-0.000813*** (5.19e-06)	-0.000756*** (1.00e-05)	-0.000756*** (1.00e-05)	-0.000756*** (1.00e-05)	-0.000964*** (1.05e-05)	-0.000842*** (7.51e-06)	-0.000842*** (7.51e-06)	-0.000899*** (7.82e-06)	-0.000899*** (7.82e-06)
qchild_under_agechildcare	-0.0423*** (0.00158)	-0.0423*** (0.00158)	-0.0218*** (0.00158)	-0.0218*** (0.00151)	-0.0218*** (0.00151)	-0.0543*** (0.00206)	-0.0339*** (0.00195)	-0.0339*** (0.00195)	-0.0449*** (0.00195)	-0.0449*** (0.00195)	-0.0449*** (0.00195)	0.0202*** (0.00410)	0.00348 (0.00312)	0.00348 (0.00312)	0.00348 (0.00312)	0.00148 (0.00303)
qchild_of_agechildcare	0.0116*** (0.00129)	0.0116*** (0.00129)	0.0116*** (0.00129)	0.0124*** (0.00122)	0.0124*** (0.00122)	0.00415** (0.00170)	0.000828 (0.00159)	0.000828 (0.00159)	0.00415** (0.00159)	0.00415** (0.00159)	0.0282*** (0.00335)	0.0487*** (0.00317)	0.0245*** (0.00256)	0.0245*** (0.00256)	0.0245*** (0.00256)	0.0136*** (0.00256)
qchild_over_agechildcare	-0.0171*** (0.000733)	-0.0171*** (0.000733)	-0.0217*** (0.000708)	-0.0217*** (0.000708)	-0.0217*** (0.000708)	-0.0230*** (0.000935)	-0.0206*** (0.000905)	-0.0206*** (0.000905)	-0.0230*** (0.000935)	-0.0230*** (0.000935)	-0.0104*** (0.00163)	-0.0124*** (0.00156)	-0.0468*** (0.00161)	-0.0468*** (0.00161)	-0.0579*** (0.00160)	-0.0579*** (0.00160)
quantity of elders	-0.0134*** (0.00188)	-0.0134*** (0.00188)	-0.0355*** (0.00188)	-0.0355*** (0.00182)	-0.0355*** (0.00182)	-0.0122*** (0.00214)	-0.0311*** (0.00201)	-0.0311*** (0.00201)	-0.0122*** (0.00214)	-0.0122*** (0.00214)	-0.0786*** (0.00617)	-0.0653*** (0.00591)	-0.00225 (0.00319)	-0.00225 (0.00319)	-0.0353*** (0.00304)	-0.0353*** (0.00304)
2.region	-0.0119*** (0.00245)	-0.0119*** (0.00245)	0.0106*** (0.00234)	0.0106*** (0.00234)	0.0106*** (0.00234)	-0.0264*** (0.00342)	-0.0176*** (0.00329)	-0.0176*** (0.00329)	-0.0264*** (0.00342)	-0.0264*** (0.00342)	0.0904*** (0.00510)	0.0722*** (0.00473)	-0.00531 (0.00410)	-0.00531 (0.00410)	-0.00727* (0.00409)	-0.00727* (0.00409)
3.region	-0.0201*** (0.00287)	-0.0201*** (0.00287)	0.0126*** (0.00281)	0.0126*** (0.00281)	0.0126*** (0.00281)	0.00338 (0.00357)	0.0233*** (0.00344)	0.0233*** (0.00344)	0.00338 (0.00357)	0.00338 (0.00357)	-0.00352 (0.00605)	0.00798 (0.00572)	0.0968*** (0.00540)	0.0968*** (0.00540)	0.116*** (0.00538)	0.116*** (0.00538)
4.region	-0.121*** (0.00254)	-0.121*** (0.00254)	-0.0958*** (0.00246)	-0.0958*** (0.00246)	-0.0958*** (0.00246)	-0.109*** (0.00402)	-0.105*** (0.00380)	-0.105*** (0.00380)	-0.109*** (0.00402)	-0.109*** (0.00402)	-0.0320*** (0.00508)	-0.0153*** (0.00456)	-0.0686*** (0.00587)	-0.0686*** (0.00587)	-0.0674*** (0.00550)	-0.0674*** (0.00550)
5.region	-0.0958*** (0.00233)	-0.0958*** (0.00233)	-0.0958*** (0.00219)	-0.0958*** (0.00219)	-0.0958*** (0.00219)	-0.0623*** (0.00291)	-0.0422*** (0.00291)	-0.0422*** (0.00291)	-0.0623*** (0.00291)	-0.0623*** (0.00291)	-0.0770*** (0.00451)	-0.00650 (0.00451)	0.0321*** (0.00432)	0.0321*** (0.00432)	0.0304*** (0.00428)	0.0304*** (0.00428)
6.region	-0.120*** (0.00232)	-0.120*** (0.00232)	-0.0703*** (0.00224)	-0.0703*** (0.00224)	-0.0703*** (0.00224)	-0.0466*** (0.00427)	-0.00966** (0.00400)	-0.00966** (0.00400)	-0.0466*** (0.00427)	-0.0466*** (0.00427)	-0.0896** (0.00414)	-0.00526 (0.00390)	-0.00576 (0.00654)	-0.00576 (0.00654)	-0.0181*** (0.00654)	-0.0181*** (0.00654)
autonomous income	0.590*** (0.00102)	0.590*** (0.00104)	-0.351*** (0.00545)	-0.551*** (0.000550)	0.623*** (0.00119)	0.620*** (0.00121)	-0.340*** (0.00681)	1.09e-07*** (3.02e-09)	0.500*** (0.00274)	0.500*** (0.00274)	0.505*** (0.00279)	4.51e-07*** (7.36e-09)	-0.445*** (0.0121)	-0.450*** (0.0122)	-1.241*** (0.0146)	-1.049*** (0.0167)
presence of partner	0.028 (0.0364)	0.028 (0.0364)	0.095 (0.0473)	0.165 (0.0246)	0.021 (0.0445)	0.022 (0.0313)	0.087 (0.0353)	-0.226*** (3.02e-09)	0.008 (0.00718)	0.008 (0.00718)	0.082 (0.0855)	0.222 (0.0869)	0.041 (0.118)	0.041 (0.0929)	0.121 (0.145)	0.156 (0.0718)
education	0.0190*** (0.000349)	0.0190*** (0.000349)	0.0190*** (0.000349)	0.0190*** (0.000349)	0.0190*** (0.000349)	0.0209*** (0.000241)	0.0204*** (0.000241)	0.0204*** (0.000241)	0.0209*** (0.000241)	0.0209*** (0.000241)	0.0209*** (0.000439)	0.0209*** (0.000439)	0.0190*** (0.000349)	0.0190*** (0.000349)	0.0190*** (0.000349)	0.0190*** (0.000349)
Constant	0.590*** (0.00102)	0.590*** (0.00104)	-0.351*** (0.00545)	-0.551*** (0.000550)	0.623*** (0.00119)	0.620*** (0.00121)	-0.340*** (0.00681)	1.09e-07*** (3.02e-09)	0.500*** (0.00274)	0.500*** (0.00274)	0.505*** (0.00279)	4.51e-07*** (7.36e-09)	-0.445*** (0.0121)	-0.450*** (0.0122)	-1.241*** (0.0146)	-1.049*** (0.0167)
Observations	3,883	3,883	3,883	3,880	2,463	2,463	2,461	2,461	872	872	872	871	1,166	1,166	1,166	1,165
R-squared	0.028	0.028	0.095	0.165	0.021	0.022	0.087	0.163	0.008	0.008	0.082	0.222	0.041	0.041	0.121	0.156
Effect at Cutoff	-0.0364	-0.0397	-0.0473	-0.0246	-0.0445	-0.0313	-0.0353	-0.000161	-0.0718	-0.0718	-0.0355	-0.0869	0.118	0.0929	0.145	0.0718

Notes: The variable “qchild_under_agechildcare” refers to the number of children that are too young to receive childcare. Similarly “qchild_of_agechildcare” and “qchild_over_agechildcare” refer to the number of children, in the household, in age to receive the childcare program and too old to receive childcare, respectively. Each observation is weighted according to the expansion factor of the ENAHO. The effect at cutoff is calculated as the sum of the parameter of D and the parameter of $D * score$ times the cutoff. The cutoff level is 20 for CENCINAI and 60.5 for IMAS. OLS regressions. Robust errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Sources: Own elaboration from ENAHO data.

Figure 5 presents the graphical results for -local nonparametric estimates of- labor force participation against the CENCINAI score. The vertical line shows the cutoff of the score. People at the right of this cutoff are eligible for the program. Importantly the graph shows a discontinuity at the cutoff. In contrast to what it might be expected, the probability of participation is lower for those with a score high enough to be eligible to receive the program.

This result is confirmed by the regression analysis presented in Table 3. In this table, participation in the labor force is regressed against the score, a dummy variable for treated, their interaction, and additional controls. Additional controls include age, the number of children in age to participate, children below and above the age of participation in the program, the region of the country the family lives, the (autonomous) income of the household, if the woman in the household has a partner, and her level of education. The last row of the table calculates the point estimate effect of having the program, evaluated at the cutoff of the score. The point estimate shows that those women with a score about the cutoff -on average- have a lower probability of participation in the labor force.

Figure 6 presents similar graphical results for the IMAS program. In this case, the graphical analysis does not give us a clear effect. Regression results presented also in Table 3 shows a positive effect on participation in the program at the cutoff. This contrasts with the results for CENCINAI. Thus, the CENCINAI program does not seem to have an effect on labor participation while the IMAS program does.

Figure 7

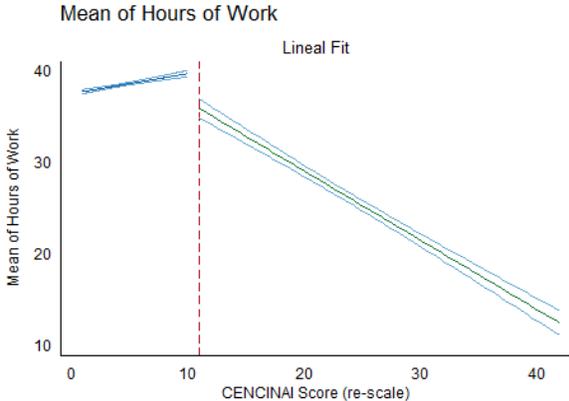
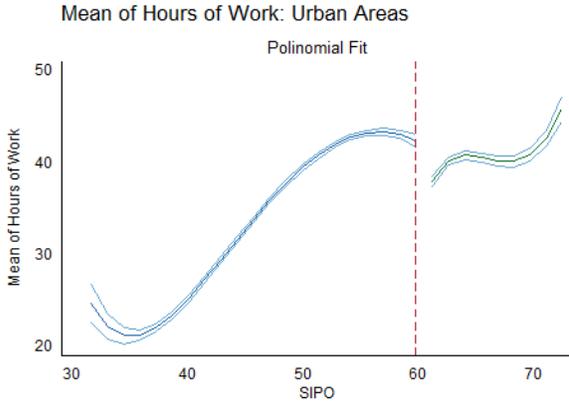


Figure 8



Source: Own elaboration with ENAHO data.

Figures 7 and 8 present the graphical analysis for hours of work. The results for CENCINAI are consistent with those for labor force participation. Both Figure 7 and the regression analysis presented in Table 4 suggest that women receiving the program work fewer hours in comparison to those who do not. Although, it is important to highlight that this result applies for the aggregate and women living in rural areas only. The regression analysis suggests a positive effect for women living in urban areas. The positive effect in urban areas is smaller (in absolute value) than the negative effect in rural areas.

For the IMAS program, both the graphical analysis presented in Figure 8 and the regression analysis of Table 4 are consistent in showing a positive effect on average working hours. This result is also consistent with those of labor force participation. Thus, the IMAS program seems to have positive effects in both the intensive and extensive margins of the labor market outcomes.

To complement the results on working hours, Figures 9 and 10, and Table 5 present the results using as outcome whether women work full time. Here working full time is defined as working (on average) at least 40 hours per week. The results are consistent with those of participation and average hours worked: there is a negative effect for CENCINAI and a positive effect for IMAS.

The above analysis points to a positive effect of the IMAS program in both the intensive and extensive margins of labor force participation. In contrast, the CENCINAI program -the larger of both programs when all child care services are considered- does not seem to have a positive effect on labor market outcomes. In this sense, it looks like that CENCINAI is not achieving the expected results in this dimension. This might be due to several factors. For example, the fact that the program is harder to receive for those that are not poor might be playing an unexpected effect. For instance, if a women receives the program and it is successful in finding a job, the income from her new job might moves her above the poverty line and therefore she is likely not eligible for the program anymore. This dynamic plays against the objective of the program. This is, as far as the score puts an important weight in poverty to receive the program it might be creating an incentive or impossibility of finding a good job an keeping the program.

Table 4: Costa Rica: Public Child Care Services Impact on the Mean of Hours Employed

	CENCINAI															
	Urban								Rural							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
D (=1)	-4.783*** (0.251)	-18.82*** (0.705)	-20.29*** (0.666)	-19.03*** (0.632)	-4.854*** (0.255)	-21.38*** (0.502)	-22.28*** (0.478)	-20.83*** (0.457)	-8.622*** (0.545)	-5.468* (3.182)	5.508* (3.027)	30.03*** (3.333)	-1.124*** (0.353)	-47.95*** (3.447)	-66.77*** (4.263)	-65.55*** (4.536)
Score	0.112*** (0.0145)	0.0167 (0.0153)	-0.00518 (0.0155)	-0.122*** (0.0156)	0.0435*** (0.00931)	-0.0471*** (0.00948)	-0.0533*** (0.00955)	-0.112*** (0.0100)	-0.249*** (0.0435)	-0.239*** (0.0452)	-0.0928** (0.0453)	-0.117*** (0.0448)	-0.169*** (0.0216)	-0.190*** (0.0221)	-0.208*** (0.0247)	-0.0320 (0.0305)
D*Score	0.886*** (0.0447)	0.907*** (0.0426)	0.907*** (0.0426)	0.871*** (0.0403)	1.200*** (0.0326)	1.228*** (0.0309)	1.228*** (0.0309)	1.142*** (0.0288)	-0.158 (0.160)	-0.158 (0.160)	-0.873*** (0.149)	-1.968*** (0.162)	0.831*** (0.0578)	1.204*** (0.0578)	1.204*** (0.0728)	1.125*** (0.0765)
age	0.709*** (0.0393)	0.709*** (0.0393)	0.709*** (0.0393)	0.835*** (0.0400)	0.835*** (0.0400)	0.348*** (0.0359)	0.348*** (0.0359)	0.555*** (0.0361)	0.546*** (0.110)	0.546*** (0.110)	0.546*** (0.110)	1.383*** (0.112)	1.013*** (0.0753)	1.013*** (0.0753)	1.013*** (0.0753)	2.110*** (0.121)
age squared	-0.00739*** (0.000494)	-0.00739*** (0.000494)	-0.00739*** (0.000494)	-0.0104*** (0.000505)	-0.0104*** (0.000505)	-0.00346*** (0.000447)	-0.00346*** (0.000447)	-0.00593*** (0.000452)	-0.00717*** (0.00146)	-0.00717*** (0.00146)	-0.00717*** (0.00146)	-0.0180*** (0.00146)	-0.0135*** (0.00100)	-0.0135*** (0.00100)	-0.0135*** (0.00100)	-0.0275*** (0.00159)
qchild_under_agechildcare	2.311*** (0.164)	2.311*** (0.164)	2.311*** (0.164)	2.943*** (0.166)	2.943*** (0.166)	5.019*** (0.150)	5.019*** (0.150)	5.185*** (0.153)	-2.167*** (0.425)	-2.167*** (0.425)	-2.167*** (0.425)	-1.542*** (0.429)	-1.542*** (0.429)	-1.542*** (0.429)	-1.542*** (0.429)	-1.542*** (0.429)
qchild_of_agechildcare	3.836*** (0.138)	3.836*** (0.138)	3.836*** (0.138)	3.740*** (0.139)	3.740*** (0.139)	1.986*** (0.129)	1.986*** (0.129)	1.550*** (0.133)	7.231*** (0.355)	7.231*** (0.355)	7.231*** (0.355)	7.560*** (0.327)	7.560*** (0.327)	7.560*** (0.327)	7.560*** (0.327)	7.560*** (0.327)
qchild_over_agechildcare	-0.401*** (0.135)	-0.401*** (0.135)	-0.401*** (0.135)	-0.113 (0.0706)	-0.113 (0.0706)	-0.113 (0.0706)	-0.113 (0.0706)	0.0553 (0.0713)	-0.00717*** (0.00146)	-0.00717*** (0.00146)	-0.00717*** (0.00146)	2.091*** (0.154)	2.091*** (0.154)	2.091*** (0.154)	2.091*** (0.154)	2.091*** (0.154)
quantity of elders	1.474*** (0.206)	1.474*** (0.206)	1.474*** (0.206)	0.965*** (0.195)	0.965*** (0.195)	2.713*** (0.207)	2.713*** (0.207)	1.522*** (0.198)	-3.707*** (0.3891)	-3.707*** (0.3891)	-3.707*** (0.3891)	-0.848* (0.540)	-0.848* (0.540)	-0.848* (0.540)	-0.848* (0.540)	-0.848* (0.540)
2.region	-4.603*** (0.297)	-4.603*** (0.297)	-4.603*** (0.297)	-4.727*** (0.291)	-4.727*** (0.291)	-3.707*** (0.247)	-3.707*** (0.247)	-3.891*** (0.241)	-6.098*** (0.752)	-6.098*** (0.752)	-6.098*** (0.752)	-6.098*** (0.732)	-6.098*** (0.732)	-6.098*** (0.732)	-6.098*** (0.732)	-6.098*** (0.732)
3.region	-3.070*** (0.305)	-3.070*** (0.305)	-3.070*** (0.305)	-1.056*** (0.303)	-1.056*** (0.303)	0.0892 (0.333)	0.0892 (0.333)	1.484*** (0.344)	-14.94*** (0.601)	-14.94*** (0.601)	-14.94*** (0.601)	-8.121*** (0.383)	-8.121*** (0.383)	-8.121*** (0.383)	-8.121*** (0.383)	-8.121*** (0.383)
4.region	-6.013*** (0.226)	-6.013*** (0.226)	-6.013*** (0.226)	-5.533*** (0.225)	-5.533*** (0.225)	-3.419*** (0.215)	-3.419*** (0.215)	-3.564*** (0.215)	-9.754*** (0.517)	-9.754*** (0.517)	-9.754*** (0.517)	-6.699*** (0.278)	-6.699*** (0.278)	-6.699*** (0.278)	-6.699*** (0.278)	-6.699*** (0.278)
5.region	2.852*** (0.255)	2.852*** (0.255)	2.852*** (0.255)	3.739*** (0.245)	3.739*** (0.245)	0.633*** (0.303)	0.633*** (0.303)	0.964*** (0.295)	-1.641*** (0.515)	-1.641*** (0.515)	-1.641*** (0.515)	0.383 (0.539)	0.383 (0.539)	0.383 (0.539)	0.383 (0.539)	0.383 (0.539)
6.region	-5.375*** (0.255)	-5.375*** (0.255)	-5.375*** (0.255)	-3.067*** (0.245)	-3.067*** (0.245)	-0.565* (0.303)	-0.565* (0.303)	0.111 (0.295)	-13.45*** (0.515)	-13.45*** (0.515)	-13.45*** (0.515)	-7.871*** (0.539)	-7.871*** (0.539)	-7.871*** (0.539)	-7.871*** (0.539)	-7.871*** (0.539)
autonomous income	7.15e-06*** (4.30e-07)	7.15e-06*** (4.30e-07)	7.15e-06*** (4.30e-07)	7.15e-06*** (4.30e-07)	7.15e-06*** (4.30e-07)	2.01e-06*** (3.73e-07)	2.01e-06*** (3.73e-07)	2.01e-06*** (3.73e-07)	1.54e-05*** (1.12e-06)							
presence of partner	-7.910*** (0.148)	-7.910*** (0.148)	-7.910*** (0.148)	-7.910*** (0.148)	-7.910*** (0.148)	-5.807*** (0.122)	-5.807*** (0.122)	-5.807*** (0.122)	-14.15*** (0.350)							
education	0.0468** (0.0191)	0.0468** (0.0191)	0.0468** (0.0191)	0.0468** (0.0191)	0.0468** (0.0191)	0.299*** (0.0170)	0.299*** (0.0170)	0.299*** (0.0170)	0.418*** (0.0545)							
Constant	36.87*** (0.194)	38.11*** (0.204)	20.61*** (0.778)	18.71*** (0.790)	38.75*** (0.111)	39.70*** (0.113)	29.13*** (0.682)	25.61*** (0.686)	39.50*** (0.844)	39.33*** (0.874)	24.71*** (2.250)	7.798*** (2.417)	51.71*** (1.376)	52.91*** (1.404)	40.16*** (1.116)	19.25*** (1.080)
Observations	922	922	922	922	781	781	781	779	141	141	141	141	600	600	600	600
R-squared	0.004	0.008	0.041	0.082	0.004	0.016	0.035	0.063	0.015	0.015	0.094	0.187	0.000	0.000	0.014	0.028
Effect at Cutoff	-4.783	-1.099	-2.152	-1.617	-4.854	2.626	2.271	2.004	-8.622	-8.624	-11.94	-9.336	-1.124	2.352	6.049	2.537

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: The variable “qchild_under_agechildcare” refers to the number of children that are too young to receive childcare. Similarly “qchild_of_agechildcare” and “qchild_over_agechildcare” refer to the number of children, in the household, in age to receive the childcare program and too old to receive childcare, respectively. Each observation is weighted according to the expansion factor of the ENAHO. The effect at cutoff is calculated as the sum of the parameter of D and the parameter of $D * score$ times the cutoff. The cutoff level is 20 for CENCINAI and 60.5 for IMAS. OLS regressions. Robust errors in parenthesis. ***p<0.01, **p<0.05, *p<0.1.

Sources: Own elaboration from ENAHO data.

Figure 9

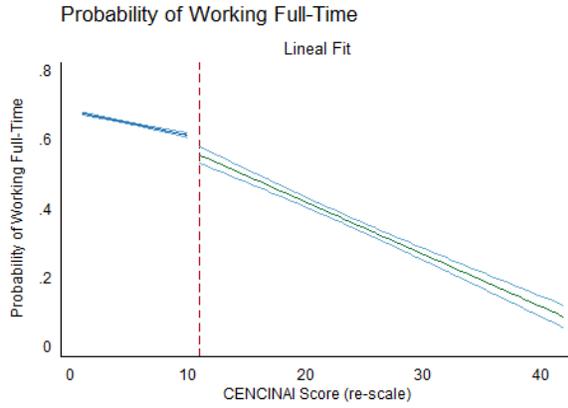
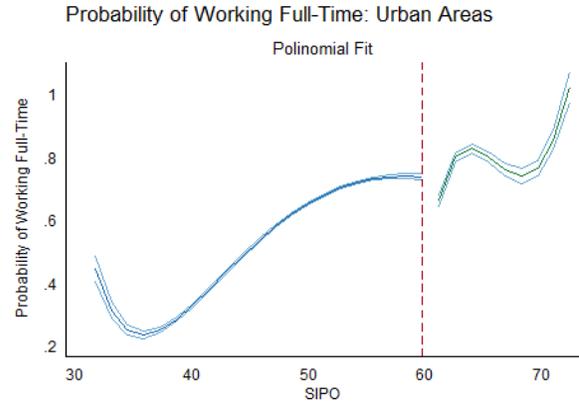


Figure 10



Source: Own elaboration with ENAHO data.

This contradictory rule is expected to be more important in the CENCINAI program than in IMAS. This is due to the fact that the IMAS score includes a larger set of variables to classify if a person qualifies for the benefits. Since a larger number of variables are considered, a priori, it can be expected that poverty -measure in terms of only income- have less weight than in the CENCINAI score that includes a more limited set of variables to classify individuals.

But even if CENCINAI program does not have a positive effect on labor market outcomes, it can have a positive effect on other variables that measure how women spend their time. For example, the program might increase the time dedicated to study or to do housework. In order to evaluate if these programs have positive effects in these two other outcomes, the next section analyzes the effect on education attendance and the following section analysis the effect on housework and care.

Table 5: Costa Rica: Public Child Care Services Impact on the Probability of Working Full Time

	CENCINAI															
	Urban								Rural							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
D (=1)	-0.0321*** (0.00237)	-0.0111** (0.00434)	-0.0161*** (0.00433)	-0.0211*** (0.00433)	-0.0315*** (0.00261)	-0.0243*** (0.00488)	-0.0255*** (0.00488)	-0.0309*** (0.00488)	-0.0309*** (0.00480)	0.0873*** (0.00874)	0.0624*** (0.00882)	0.0516*** (0.00873)	0.0270*** (0.00401)	-0.208*** (0.0371)	-0.288*** (0.0363)	-0.243*** (0.0370)
Score	-0.000483*** (3.06e-05)	-0.000434*** (3.13e-05)	-0.000760*** (3.21e-05)	-0.000917*** (3.71e-05)	-0.000595*** (3.19e-05)	-0.000578*** (3.29e-05)	-0.00101*** (3.52e-05)	-0.00117*** (4.08e-05)	-0.000986*** (6.94e-05)	-0.000757*** (7.00e-05)	-0.000970*** (7.16e-05)	-0.00110*** (8.12e-05)	0.000206* (0.000118)	0.000110 (0.000119)	0.0020*** (0.000123)	0.00634*** (0.000180)
D*Score	-0.000818*** (0.000146)	-0.000483*** (0.000145)	-0.000413*** (0.000144)	-0.000413*** (0.000144)	-0.000228* (0.000135)	-0.000166 (0.000132)	-0.000166 (0.000132)	-6.96e-05 (0.000132)	-0.000603*** (0.000415)	-0.00447*** (0.000419)	-0.00389*** (0.000410)	-0.00389*** (0.000410)	0.00459*** (0.000707)	0.00600*** (0.000693)	0.00600*** (0.000693)	0.00496*** (0.000705)
age			-0.0185*** (0.000238)	-0.0202*** (0.000258)			-0.0202*** (0.000270)	-0.0211*** (0.000290)			-0.0167*** (0.000494)	-0.0218*** (0.000549)			-0.0179*** (0.000321)	-0.0186*** (0.000346)
age squared			0.000218*** (3.25e-06)	0.000243*** (3.49e-06)			0.000238*** (3.65e-06)	0.000252*** (3.88e-06)			0.000205*** (6.98e-06)	0.000267*** (7.73e-06)			0.000211*** (4.24e-06)	0.000217*** (4.54e-06)
qchild_under_agechildcare			0.0338*** (0.00133)	0.0296*** (0.00133)			0.0539*** (0.00134)	0.0519*** (0.00135)			-0.00708** (0.00277)	-0.0110*** (0.00276)			0.0415*** (0.00192)	0.0419*** (0.00192)
qchild_of_agechildcare			0.00265** (0.00110)	0.00157 (0.00110)			0.00833*** (0.00110)	0.00810*** (0.00110)			-0.0226*** (0.00236)	-0.0247*** (0.00238)			0.0197*** (0.00154)	0.0208*** (0.00154)
qchild_over_agechildcare			0.00662*** (0.000598)	0.00656*** (0.000608)			0.00245*** (0.000690)	0.00188*** (0.000697)			0.00222* (0.00115)	0.00424*** (0.00118)			0.0196*** (0.000864)	0.0186*** (0.000871)
quantity of elders			0.0238*** (0.00148)	0.0252*** (0.00149)			0.0363*** (0.00149)	0.0355*** (0.00150)			-0.0315*** (0.00451)	-0.0274*** (0.00452)			0.0620*** (0.00157)	0.0630*** (0.00159)
2.region			-0.0386*** (0.00214)	-0.0426*** (0.00214)			-0.0358*** (0.00270)	-0.0401*** (0.00271)			-0.0490*** (0.00383)	-0.0487*** (0.00384)			-0.0139*** (0.00313)	-0.0219*** (0.00315)
3.region			-0.0436*** (0.00255)	-0.0482*** (0.00256)			-0.0436*** (0.00301)	-0.0474*** (0.00302)			-0.0517*** (0.00483)	-0.0558*** (0.00481)			-0.0441*** (0.00385)	-0.0453*** (0.00388)
4.region			-0.0236*** (0.00288)	-0.0288*** (0.00288)			-0.00251 (0.00691)**	-0.00691** (0.00691)**			-0.0597*** (0.00983)	-0.0628*** (0.00983)			-0.0361*** (0.00393)	-0.0382*** (0.00393)
5.region			0.0186*** (0.00183)	0.0133*** (0.00184)			0.00850*** (0.00228)	0.00578*** (0.00228)			0.0467*** (0.00319)	0.0369*** (0.00319)			-0.00686** (0.00299)	-0.0116*** (0.00299)
6.region			0.0295*** (0.00181)	0.0227*** (0.00183)			0.0461*** (0.00286)	0.0433*** (0.00286)			0.0203*** (0.00295)	0.00966*** (0.00295)			0.0933*** (0.00309)	0.0892*** (0.00301)
autonomous income			-6.45e-08*** (3.03e-09)	-6.45e-08*** (3.03e-09)			-7.51e-08*** (3.27e-09)	-7.51e-08*** (3.27e-09)				-3.53e-08*** (7.10e-09)				-1.25e-07*** (3.71e-09)
presence of partner			0.0329*** (0.00127)	0.0329*** (0.00127)			0.0210*** (0.00142)	0.0210*** (0.00142)				0.0610*** (0.00271)				0.0255*** (0.00167)
education			0.00128*** (0.000179)	0.00128*** (0.000179)			0.00221*** (0.000209)	0.00221*** (0.000209)				-0.00253*** (0.000349)				-0.000306 (0.000253)
Constant	0.831*** (0.000805)	0.830*** (0.000813)	1.154*** (0.00420)	1.177*** (0.00452)	0.833*** (0.000906)	0.833*** (0.000918)	1.185*** (0.00476)	1.191*** (0.00510)	0.835*** (0.00170)	0.831*** (0.00170)	1.164*** (0.00898)	1.248*** (0.00946)	0.816*** (0.00624)	0.821*** (0.00632)	0.997*** (0.00855)	0.822*** (0.0101)
Observations	3,665	3,665	3,665	3,662	2,652	2,652	2,652	2,650	1,085	1,085	1,085	1,084	1,810	1,810	1,810	1,808
R-squared	0.001	0.001	0.019	0.021	0.002	0.002	0.025	0.028	0.002	0.004	0.025	0.031	0.000	0.000	0.021	0.027
Effect at Cutoff	-0.0321	-0.0275	-0.0257	-0.0294	-0.0315	-0.0289	-0.0288	-0.0323	-0.0309	-0.0333	-0.0270	-0.0262	0.0270	0.0695	0.0755	0.0568

Notes: The variable “qchild_under_agechildcare” refers to the number of children that are too young to receive childcare. Similarly “qchild_of_agechildcare” and “qchild_over_agechildcare” refer to the number of children, in the household, in age to receive the childcare program and too old to receive childcare, respectively. Each observation is weighted according to the expansion factor of the ENAHO. The effect at cutoff is calculated as the sum of the parameter of D and the parameter of $D * score$ times the cutoff. The cutoff level is 20 for CENCINAI and 60.5 for IMAS. OLS regressions. Robust errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Sources: Own elaboration from ENAHO data.

8 Results: The Impact on Education Attendance

The program of child care is thought to alleviate time constraints of mothers not only for them to work but to study also. Because the survey does not allow to identify directly which women within the household is the mother of the recipient, we restrict the sample to women from 15 to 65 years old, who has some incomplete education, high-school or less, and are in households with at least one minor being 6 years old or under. This approximation could be including mothers as well as spillovers of the effective use of the child care.

Education attendance is measured as a dummy variable that indicates whether each woman of the household -in the sample- is attending school or not. Then, the observed probability of attending school is estimated as the proportion of women attending school over the total of women with a given score.

Figure 11

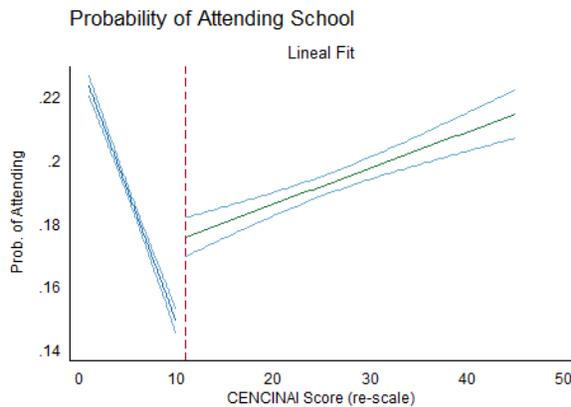
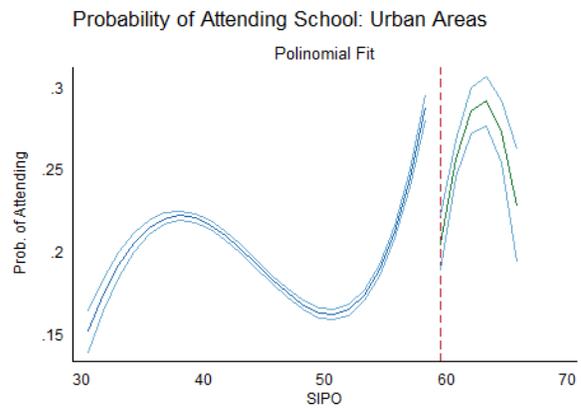


Figure 12



Source: Own elaboration with ENAHO data.

Figure 11 presents the graphical results of a local nonparametric regression for CENCINAI while Figure 12 presents a similar exercise for IMAS. Both graphs suggest a positive effect of the programs on the probability of attending school.

These results are confirmed by the regressions presented in Table 6, where additional controls are included. The last row of this table presents the (point estimate) difference in the probability of attending school between those who receive the benefits of the programs and those who does not, evaluated at the respective cutoffs. This row shows a positive effect of both programs in the aggregate. Even more, the CENCINAI program seems to have a positive effect on both rural and urban areas, with a greater effect in rural zones.

These effects contrast those of labor force participation for the CENCINAI program. Thus, although this program does not seem to have an effect on labor force participation in the extensive or intensive margins, it seems to have a positive effect on school attendance.

In general, there is at least another possible effect of the programs. Since child care frees time, this can also be spent on unpaid domestic work. This outcome is evaluated in the next section.

9 Results: The Impact on Unpaid Domestic Work

A third option that we explore is whether women who send their children to child care services are spending their time not getting into the labor market or studying, but in unpaid domestic work. Two main types of domestic work are explored here: housework and carework. Housework refers to household chores such as washing, ironing, cooking, cleaning, or other tasks performed in the home.

Carework refers to take care or look after children, elderly people or people with disabilities that are members of the household. The ENAHO inquires for the number of hours each person dedicated to these activities during the last week. For our effects, the sample is restricted to women from 15 years old in households that have at least one minor under 7 years old.

Figure 13

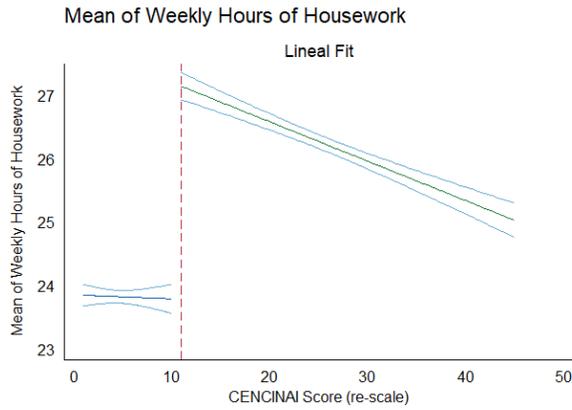
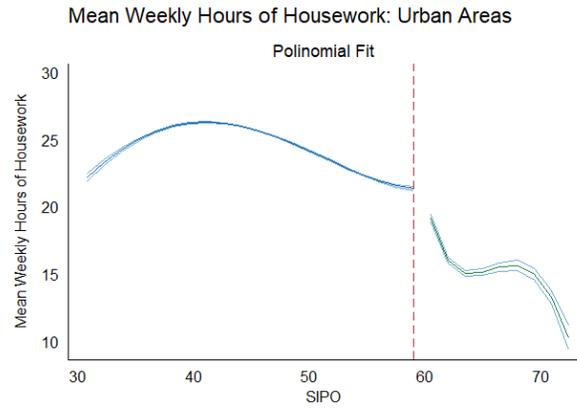


Figure 14



Source: Own elaboration with ENAHO data.

Graphical results for housework are presented in Figures 13 and 14. For the CENCINAI program, the graph suggests a positive effect on hours dedicated to housework. The graphical results for IMAS are not conclusive.

The results for CENCINAI are confirmed by the regressions presented in Table 7. The last row of this table shows a positive effect of CENCINAI benefits to aggregate housework. This result is also valid for women of urban areas, although there is a small negative effect for those women in rural areas.

The CENCINAI program seems to also increase the time dedicated to carework as suggested by Figure 15 and the regression results in Table 8. Thus, CENCINAI does not seem to have a positive effect on labor market participation but it seems to have a positive effect on school attendance as well as house- and care-work. These results might be due to the weight the score puts in being poor. If a women that is receiving the benefits finds a job that moves her out of poverty, chances are that she is not eligible for the benefits anymore. Thus, it seems plausible that these women dedicate more time to other activities as education and unpaid housework.

Table 7: Costa Rica: Public Child Care Services Impact on Housework Hours

	CENCINAI																IMAS															
	Total								Rural								Urban								Urban							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)				
D (=1)	0.743*** (0.131)	-3.089*** (0.328)	-3.951*** (0.314)	-2.616*** (0.297)	0.805*** (0.167)	-7.061*** (0.448)	-8.844*** (0.461)	-3.825*** (0.446)	0.554*** (0.188)	5.935*** (0.394)	4.720*** (0.375)	4.285*** (0.380)	-1.551*** (0.223)	33.80*** (3.444)	41.78*** (3.507)	42.51*** (2.878)	0.743*** (0.131)	-3.089*** (0.328)	-3.951*** (0.314)	-2.616*** (0.297)	0.805*** (0.167)	5.935*** (0.394)	4.720*** (0.375)	4.285*** (0.380)	-1.551*** (0.223)	33.80*** (3.444)	41.78*** (3.507)	42.51*** (2.878)				
Score	-0.0817*** (0.00611)	-0.110*** (0.00652)	-0.127*** (0.00632)	-0.0412*** (0.00841)	0.0894*** (0.00992)	0.0219*** (0.0110)	-0.0414*** (0.0105)	0.115*** (0.0132)	0.00553 (0.00597)	0.0307*** (0.00629)	0.0266*** (0.00585)	-0.0291*** (0.00656)	-0.595*** (0.0113)	-0.578*** (0.0116)	-0.689*** (0.0115)	-0.378*** (0.0114)	-0.0817*** (0.00611)	-0.110*** (0.00652)	-0.127*** (0.00632)	-0.0412*** (0.00841)	0.0894*** (0.00992)	0.0219*** (0.0110)	-0.0414*** (0.0105)	0.115*** (0.0132)	0.00553 (0.00597)	0.0307*** (0.00629)	0.0266*** (0.00585)	-0.0291*** (0.00656)	-0.595*** (0.0113)	-0.578*** (0.0116)	-0.689*** (0.0115)	-0.378*** (0.0114)
D*Score	0.223*** (0.0186)	0.223*** (0.0186)	0.270*** (0.0168)	0.222*** (0.0159)	0.440*** (0.0254)	0.440*** (0.0254)	0.550*** (0.0246)	0.310*** (0.0242)	0.00597 (0.0185)	-0.314*** (0.0185)	-0.315*** (0.0168)	-0.303*** (0.0176)	-0.303*** (0.0176)	-0.623*** (0.0614)	-0.757*** (0.0624)	-0.713*** (0.0505)	0.223*** (0.0186)	0.223*** (0.0186)	0.270*** (0.0168)	0.222*** (0.0159)	0.440*** (0.0254)	0.440*** (0.0254)	0.550*** (0.0246)	0.310*** (0.0242)	0.00597 (0.0185)	-0.314*** (0.0185)	-0.315*** (0.0168)	-0.303*** (0.0176)	-0.303*** (0.0176)	-0.623*** (0.0614)	-0.757*** (0.0624)	-0.713*** (0.0505)
age	1.756*** (0.0178)	1.302*** (0.0178)	1.302*** (0.0178)	1.499*** (0.0250)	1.031*** (0.0244)	1.031*** (0.0244)	1.449*** (0.0250)	1.031*** (0.0244)	1.031*** (0.0244)	2.148*** (0.0210)	2.148*** (0.0210)	1.596*** (0.0221)	1.596*** (0.0221)	0.0203 (0.0203)	0.577*** (0.0203)	0.0147 (0.0219)	1.756*** (0.0178)	1.302*** (0.0178)	1.302*** (0.0178)	1.499*** (0.0250)	1.031*** (0.0244)	1.031*** (0.0244)	1.449*** (0.0250)	1.031*** (0.0244)	1.031*** (0.0244)	2.148*** (0.0210)	2.148*** (0.0210)	1.596*** (0.0221)	1.596*** (0.0221)	0.0203 (0.0203)	0.577*** (0.0203)	0.0147 (0.0219)
age squared	-0.0197*** (0.000245)	-0.0197*** (0.000245)	-0.0197*** (0.000245)	-0.0146*** (0.000244)	-0.0146*** (0.000244)	-0.0152*** (0.000344)	-0.0152*** (0.000344)	-0.0106*** (0.000336)	-0.0106*** (0.000336)	-0.0253*** (0.000288)	-0.0253*** (0.000288)	-0.0187*** (0.000299)	-0.0187*** (0.000299)	-0.00231*** (0.000286)	-0.00231*** (0.000286)	0.00437*** (0.000286)	-0.0197*** (0.000245)	-0.0197*** (0.000245)	-0.0197*** (0.000245)	-0.0146*** (0.000244)	-0.0146*** (0.000244)	-0.0152*** (0.000344)	-0.0152*** (0.000344)	-0.0106*** (0.000336)	-0.0106*** (0.000336)	-0.0253*** (0.000288)	-0.0253*** (0.000288)	-0.0187*** (0.000299)	-0.0187*** (0.000299)	-0.00231*** (0.000286)	-0.00231*** (0.000286)	0.00437*** (0.000286)
qchild_under_agechildcare	0.610*** (0.0963)	0.610*** (0.0963)	0.610*** (0.0963)	-0.163*** (0.0921)	-0.163*** (0.0921)	1.442*** (0.135)	1.442*** (0.135)	0.724*** (0.128)	0.724*** (0.128)	0.277*** (0.125)	0.277*** (0.125)	-0.531*** (0.122)	-0.531*** (0.122)	-1.440*** (0.143)	-1.440*** (0.143)	-2.126*** (0.141)	0.610*** (0.0963)	0.610*** (0.0963)	0.610*** (0.0963)	-0.163*** (0.0921)	-0.163*** (0.0921)	1.442*** (0.135)	1.442*** (0.135)	0.724*** (0.128)	0.724*** (0.128)	0.277*** (0.125)	0.277*** (0.125)	-0.531*** (0.122)	-0.531*** (0.122)	-1.440*** (0.143)	-1.440*** (0.143)	-2.126*** (0.141)
qchild_of_agechildcare	-0.853*** (0.0681)	-0.853*** (0.0681)	-0.853*** (0.0681)	-1.040*** (0.0651)	-1.040*** (0.0651)	-1.875*** (0.0867)	-1.875*** (0.0867)	-1.968*** (0.0846)	-1.968*** (0.0846)	0.791*** (0.106)	0.791*** (0.106)	0.0293 (0.104)	0.0293 (0.104)	-0.354*** (0.124)	-0.354*** (0.124)	0.0122 (0.121)	-0.853*** (0.0681)	-0.853*** (0.0681)	-0.853*** (0.0681)	-1.040*** (0.0651)	-1.040*** (0.0651)	-1.875*** (0.0867)	-1.875*** (0.0867)	-1.968*** (0.0846)	-1.968*** (0.0846)	0.791*** (0.106)	0.791*** (0.106)	0.0293 (0.104)	0.0293 (0.104)	-0.354*** (0.124)	-0.354*** (0.124)	0.0122 (0.121)
qchild_over_agechildcare	-0.784*** (0.111)	-0.784*** (0.111)	-0.784*** (0.111)	-0.520*** (0.107)	-0.520*** (0.107)	-0.970*** (0.140)	-0.970*** (0.140)	-0.546*** (0.135)	-0.546*** (0.135)	-0.828*** (0.182)	-0.828*** (0.182)	-0.696*** (0.177)	-0.696*** (0.177)	0.0233 (0.144)	0.0233 (0.144)	0.672*** (0.135)	-0.784*** (0.111)	-0.784*** (0.111)	-0.784*** (0.111)	-0.520*** (0.107)	-0.520*** (0.107)	-0.970*** (0.140)	-0.970*** (0.140)	-0.546*** (0.135)	-0.546*** (0.135)	-0.828*** (0.182)	-0.828*** (0.182)	-0.696*** (0.177)	-0.696*** (0.177)	0.0233 (0.144)	0.0233 (0.144)	0.672*** (0.135)
quantity of elders	3.981*** (0.137)	3.981*** (0.137)	3.981*** (0.137)	4.036*** (0.131)	4.036*** (0.131)	3.627*** (0.181)	3.627*** (0.181)	3.703*** (0.163)	3.703*** (0.163)	3.083*** (0.170)	3.083*** (0.170)	3.095*** (0.161)	3.095*** (0.161)	-1.314*** (0.144)	-1.314*** (0.144)	-0.0195 (0.143)	3.981*** (0.137)	3.981*** (0.137)	3.981*** (0.137)	4.036*** (0.131)	4.036*** (0.131)	3.627*** (0.181)	3.627*** (0.181)	3.703*** (0.163)	3.703*** (0.163)	3.083*** (0.170)	3.083*** (0.170)	3.095*** (0.161)	3.095*** (0.161)	-1.314*** (0.144)	-1.314*** (0.144)	-0.0195 (0.143)
2.region	1.195*** (0.145)	1.195*** (0.145)	1.195*** (0.145)	0.498*** (0.139)	0.498*** (0.139)	-1.479*** (0.175)	-1.479*** (0.175)	-2.217*** (0.167)	-2.217*** (0.167)	-1.564*** (0.252)	-1.564*** (0.252)	-1.620*** (0.245)	-1.620*** (0.245)	1.730*** (0.209)	1.730*** (0.209)	1.546*** (0.200)	1.195*** (0.145)	1.195*** (0.145)	1.195*** (0.145)	0.498*** (0.139)	0.498*** (0.139)	-1.479*** (0.175)	-1.479*** (0.175)	-2.217*** (0.167)	-2.217*** (0.167)	-1.564*** (0.252)	-1.564*** (0.252)	-1.620*** (0.245)	-1.620*** (0.245)	1.730*** (0.209)	1.730*** (0.209)	1.546*** (0.200)
3.region	-2.928*** (0.443)	-2.928*** (0.443)	-2.928*** (0.443)	-3.353*** (0.431)	-3.353*** (0.431)	-3.369*** (0.431)	-3.369*** (0.431)	-3.596*** (0.421)	-3.596*** (0.421)	-3.353*** (0.415)	-3.353*** (0.415)	-4.734*** (0.408)	-4.734*** (0.408)	-3.209 (0.408)	-3.209 (0.408)	-1.408*** (0.408)	-2.928*** (0.443)	-2.928*** (0.443)	-2.928*** (0.443)	-3.353*** (0.431)	-3.353*** (0.431)	-3.369*** (0.431)	-3.369*** (0.431)	-3.596*** (0.421)	-3.596*** (0.421)	-3.353*** (0.415)	-3.353*** (0.415)	-4.734*** (0.408)	-4.734*** (0.408)	-3.209 (0.408)	-3.209 (0.408)	-1.408*** (0.408)
4.region	2.443*** (0.153)	2.443*** (0.153)	2.443*** (0.153)	2.391*** (0.151)	2.391*** (0.151)	3.155*** (0.238)	3.155*** (0.238)	3.781*** (0.234)	3.781*** (0.234)	-0.00385 (0.180)	-0.00385 (0.180)	-0.578*** (0.177)	-0.578*** (0.177)	5.266*** (0.226)	5.266*** (0.226)	4.446*** (0.215)	2.443*** (0.153)	2.443*** (0.153)	2.443*** (0.153)	2.391*** (0.151)	2.391*** (0.151)	3.155*** (0.238)	3.155*** (0.238)	3.781*** (0.234)	3.781*** (0.234)	-0.00385 (0.180)	-0.00385 (0.180)	-0.578*** (0.177)	-0.578*** (0.177)	5.266*** (0.226)	5.266*** (0.226)	4.446*** (0.215)
5.region	-1.655*** (0.113)	-1.655*** (0.113)	-1.655*** (0.113)	-1.916*** (0.109)	-1.916*** (0.109)	-1.493*** (0.151)	-1.493*** (0.151)	-1.491*** (0.151)	-1.491*** (0.151)	-3.690*** (0.151)	-3.690*** (0.151)	-4.119*** (0.146)	-4.119*** (0.146)	2.792*** (0.168)	2.792*** (0.168)	3.083*** (0.152)	-1.655*** (0.113)	-1.655*** (0.113)	-1.655*** (0.113)	-1.916*** (0.109)	-1.916*** (0.109)	-1.493*** (0.151)	-1.493*** (0.151)	-1.491*** (0.151)	-1.491*** (0.151)	-3.690*** (0.151)	-3.690*** (0.151)	-4.119*** (0.146)	-4.119*** (0.146)	2.792*** (0.168)	2.792*** (0.168)	3.083*** (0.152)
6.region	1.135*** (0.123)	1.135*** (0.123)	1.135*** (0.123)	0.240*** (0.121)	0.240*** (0.121)	4.021*** (0.239)	4.021*** (0.239)	3.252*** (0.236)	3.252*** (0.236)	-1.274*** (0.153)	-1.274*** (0.153)	-2.629*** (0.148)	-2.629*** (0.148)	0.825*** (0.222)	0.825*** (0.222)	1.295*** (0.218)	1.135*** (0.123)	1.135*** (0.123)	1.135*** (0.123)	0.240*** (0.121)	0.240*** (0.121)	4.021*** (0.239)	4.021*** (0.239)	3.252*** (0.236)	3.252*** (0.236)	-1.274*** (0.153)	-1.274*** (0.153)	-2.629*** (0.148)	-2.629*** (0.148)	0.825*** (0.222)	0.825*** (0.222)	1.295*** (0.218)
autonomous income	8.86e-07 (8.86e-07)	8.86e-07 (8.86e-07)	8.86e-07 (8.86e-07)	8.114*** (0.0821)	8.114*** (0.0821)	-3.41e-06*** (1.08e-06)	-3.41e-06*** (1.08e-06)	9.038*** (0.106)	9.038*** (0.106)	-5.52e-06*** (5.63e-07)	-5.52e-06*** (5.63e-07)	-7.461*** (0.113)	-7.461*** (0.113)	9.566*** (0.0931)	9.566*** (0.0931)	9.566*** (0.0931)	8.86e-07 (8.86e-07)	8.86e-07 (8.86e-07)	8.86e-07 (8.86e-07)	8.114*** (0.0821)	8.114*** (0.0821)	-3.41e-06*** (1.08e-06)	-3.41e-06*** (1.08e-06)	9.038*** (0.106)	9.038*** (0.106)	-5.52e-06*** (5.63e-07)	-5.52e-06*** (5.63e-07)	-7.461*** (0.113)	-7.461*** (0.113)	9.566*** (0.0931)	9.566*** (0.0931)	9.566*** (0.0931)
presence of partner	8.114*** (0.0821)	8.114*** (0.0821)	8.114*** (0.0821)	-0.233*** (0.00742)	-0.233*** (0.00742)	25.34*** (0.478)	25.34*** (0.478)	1.406*** (0.530)	1.406*** (0.530)	27.20*** (0.128)	27.20*** (0.128)	26.74*** (0.133)	26.74*** (0.133)	55.10*** (0.667)	55.10*** (0.667)	36.45*** (0.741)	8.114*** (0.0821)	8.114*** (0.0821)	8.114*** (0.0821)	-0.233*** (0.00742)	-0.233*** (0.00742)	25.34*** (0.478)	25.34*** (0.478)	1.406*** (0.530)	1.406*** (0.530)	27.20*** (0.128)	27.20*** (0.128)	26.74*** (0.133)	26.74*** (0.133)	55.10*** (0.667)	55.10*** (0.667)	36.45*** (0.741)
education	28.22*** (0.136)	28.22*** (0.136)	28.22*** (0.136)	1.770*** (0.377)	1.770*** (0.377)	23.89*** (0.220)	23.89*** (0.220)	1.406*** (0.530)	1.406*** (0.530)	27.20*** (0.128)	27.20*** (0.128)	26.74*** (0.133)	26.74*** (0.133)	55.10*** (0.667)	55.10*** (0.667)	36.45*** (0.741)	28.22*** (0.136)	28.22*** (0.136)	28.22*** (0.136)	1.770*** (0.377)	1.770*** (0.377)	23.89*** (0.220)	23.89*** (0.220)	1.406*** (0.530)	1.406*** (0.530)	27.20*** (0.128)	27.20*** (0.128)	26.74*** (0.133)	26.74*** (0.133)	55.10*** (0.667)	55.10*** (0.667)	36.45*** (0.741)
Constant	28.22*** (0.136)	28.22*** (0.136)	28.22*** (0.136)	1.770*** (0.377)	1.770*** (0.377)	23.89*** (0.220)	23.89*** (0.220)	1.406*** (0.530)	1.406*** (0.530)	27.20*** (0.128)	27.20*** (0.128)	26.74*** (0.133)	26.74*** (0.133)	55.10*** (0.667)	55.10*** (0.667)	36.45*** (0.741)	28.22*** (0.136)	28.22*** (0.136)	28.22*** (0.136)	1.770*** (0.377)	1.770*** (0.377)	23.89*** (0.220)	23.89*** (0.220)	1.406*** (0.530)	1.406*** (0.530)	27.20*** (0.128)	27.20*** (0.128)	26.74***				

Figure 15

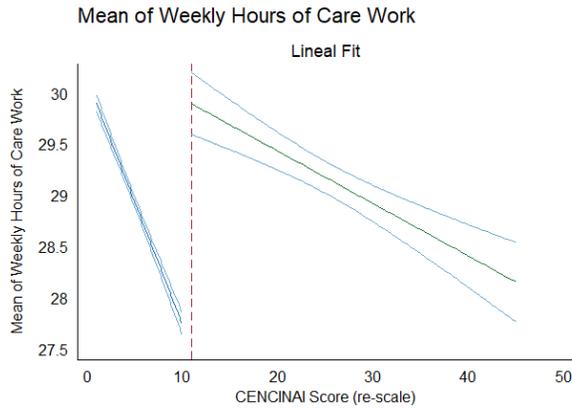
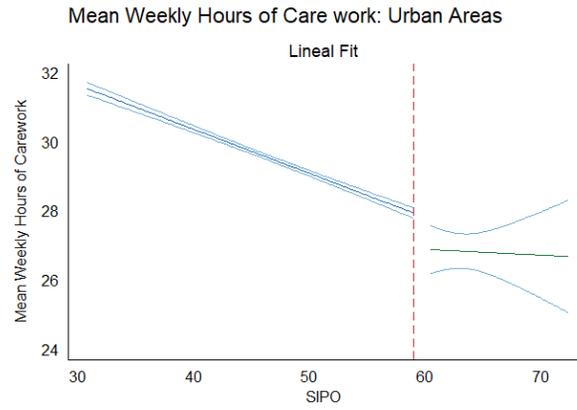


Figure 16



Source: Own elaboration with ENAHO data.

The regression analysis for IMAS suggests a negative effect of the program on housework. A similar result for carework in the IMAS program is presented in Figure 16 and it is confirmed by the regressions in Table 8. Thus, for this program it seems that there is a positive effect on labor market outcomes and on education attendance but not on housework or carework. Different from the CENCINAI program, the IMAS program takes into account more variables to define if an individual is eligible for the program benefits. Since more variables are considered it is very likely that the “perverse” effect presented in CENCINAI is mitigated allowing the program to have greater effect on labor market outcomes. Although, plausible this explanation needs to be studied more carefully.

Table 8: Costa Rica: Public Child Care Services Impact on Carework Hours

	IMAS															
	CENCINAI								Rural							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
D (=1)	0.679*** (0.116)	-1.370*** (0.197)	-1.135*** (0.193)	-1.630*** (0.190)	3.503*** (0.300)	-2.718*** (1.121)	-7.777*** (1.095)	-0.897 (0.174)	2.856*** (0.338)	-21.37*** (0.830)	-17.52*** (0.833)	-18.98*** (0.876)	-9.901*** (0.389)	180.0*** (6.957)	185.9*** (10.91)	193.1*** (11.99)
Score	-0.00762*** (0.00278)	-0.0173*** (0.00291)	0.0466*** (0.00311)	0.0351*** (0.00361)	0.0868*** (0.0199)	0.0388* (0.0215)	0.0399* (0.0208)	0.464*** (0.0250)	-0.0573*** (0.0155)	-0.145*** (0.0157)	-0.0761*** (0.0146)	-0.198*** (0.0184)	-0.945*** (0.0405)	-0.905*** (0.0410)	-1.152*** (0.0398)	-0.791*** (0.0442)
D*Score	0.117*** (0.00957)	0.113*** (0.00933)	0.113*** (0.00933)	0.125*** (0.00938)	0.301*** (0.0570)	0.301*** (0.0570)	0.562*** (0.0537)	0.218*** (0.0524)	1.776*** (0.0525)	1.622*** (0.0557)	1.622*** (0.0557)	1.694*** (0.0576)	-3.212*** (0.1177)	-3.168*** (0.1112)	-3.212*** (0.1177)	-3.283*** (0.195)
age	0.578*** (0.0158)	0.578*** (0.0158)	0.578*** (0.0158)	0.464*** (0.0166)	0.464*** (0.0166)	0.464*** (0.0166)	0.608*** (0.0401)	0.473*** (0.0402)	0.332*** (0.0523)	0.332*** (0.0523)	0.332*** (0.0523)	0.347*** (0.0557)	0.577*** (0.0483)	0.577*** (0.0483)	0.577*** (0.0483)	0.448*** (0.0577)
age squared	-0.00978*** (0.000204)	-0.00978*** (0.000204)	-0.00978*** (0.000204)	-0.00830*** (0.000214)	-0.00830*** (0.000214)	-0.00830*** (0.000214)	-0.00846*** (0.000525)	-0.00677*** (0.000528)	-0.00981*** (0.000665)	-0.00981*** (0.000665)	-0.00981*** (0.000665)	-0.101*** (0.000710)	-0.00923*** (0.000550)	-0.00923*** (0.000550)	-0.00923*** (0.000550)	-0.00822*** (0.000666)
qchild_under_agechildcare	2.431*** (0.0706)	2.431*** (0.0706)	2.431*** (0.0706)	2.246*** (0.0706)	2.246*** (0.0706)	2.246*** (0.0706)	0.468*** (0.168)	0.319* (0.168)	5.021*** (0.218)	5.021*** (0.218)	5.021*** (0.218)	4.943*** (0.219)	8.922*** (0.330)	8.922*** (0.330)	8.922*** (0.330)	9.535*** (0.327)
qchild_of_agechildcare	-1.345*** (0.0574)	-1.345*** (0.0574)	-1.345*** (0.0574)	-1.368*** (0.0571)	-1.368*** (0.0571)	-1.368*** (0.0571)	-0.333** (0.141)	-0.736*** (0.141)	0.470*** (0.157)	0.470*** (0.157)	0.470*** (0.157)	0.451*** (0.157)	2.369*** (0.277)	2.369*** (0.277)	2.369*** (0.277)	3.000*** (0.276)
qchild_over_agechildcare	-2.045*** (0.0989)	-2.045*** (0.0989)	-2.045*** (0.0989)	-2.007*** (0.0348)	-2.007*** (0.0348)	-2.007*** (0.0348)	-3.119*** (0.0844)	-2.609*** (0.0829)	-0.183* (0.083)	-0.183* (0.083)	-0.183* (0.083)	-0.374*** (0.109)	-4.652*** (0.142)	-4.652*** (0.142)	-4.652*** (0.142)	-4.437*** (0.151)
quantity of elders	0.341*** (0.0801)	0.341*** (0.0801)	0.341*** (0.0801)	0.536*** (0.0813)	0.536*** (0.0813)	0.536*** (0.0813)	0.0754 (0.173)	1.046*** (0.173)	-1.711*** (0.308)	-1.711*** (0.308)	-1.711*** (0.308)	-2.011*** (0.313)	0.685** (0.308)	0.685** (0.308)	0.685** (0.308)	1.180*** (0.298)
2.region	0.101 (0.101)	0.101 (0.101)	0.101 (0.101)	-0.310*** (0.101)	-0.310*** (0.101)	-0.310*** (0.101)	-3.224*** (0.271)	-3.191*** (0.263)	-2.340*** (0.272)	-2.340*** (0.272)	-2.340*** (0.272)	-2.445*** (0.270)	-2.228*** (0.340)	-2.228*** (0.340)	-2.228*** (0.340)	-3.959*** (0.352)
3.region	-1.911*** (0.140)	-1.911*** (0.140)	-1.911*** (0.140)	-2.374*** (0.141)	-2.374*** (0.141)	-2.374*** (0.141)	-8.174*** (0.251)	-8.300*** (0.246)	-10.26*** (0.443)	-10.26*** (0.443)	-10.26*** (0.443)	-10.43*** (0.451)	-1.046 (0.827)	-1.046 (0.827)	-1.046 (0.827)	-1.563* (0.815)
4.region	0.338*** (0.118)	0.338*** (0.118)	0.338*** (0.118)	-0.0330 (0.118)	-0.0330 (0.118)	-0.0330 (0.118)	-2.667*** (0.347)	-2.808*** (0.383)	-3.914*** (0.313)	-3.914*** (0.313)	-3.914*** (0.313)	-4.377*** (0.315)	5.025*** (0.368)	5.025*** (0.368)	5.025*** (0.368)	3.660*** (0.367)
5.region	-3.076*** (0.0980)	-3.076*** (0.0980)	-3.076*** (0.0980)	-3.575*** (0.0979)	-3.575*** (0.0979)	-3.575*** (0.0979)	-4.518*** (0.301)	-5.592*** (0.303)	-7.174*** (0.319)	-7.174*** (0.319)	-7.174*** (0.319)	-7.271*** (0.321)	-0.823*** (0.349)	-0.823*** (0.349)	-0.823*** (0.349)	-1.544*** (0.345)
6.region	0.749*** (0.118)	0.749*** (0.118)	0.749*** (0.118)	-0.0633 (0.118)	-0.0633 (0.118)	-0.0633 (0.118)	4.497*** (0.529)	3.288*** (0.541)	-4.570*** (0.300)	-4.570*** (0.300)	-4.570*** (0.300)	-5.127*** (0.310)	0.783* (0.422)	0.783* (0.422)	0.783* (0.422)	-2.651*** (0.433)
autonomous income	-4.57e-06*** (1.15e-07)	-4.57e-06*** (1.15e-07)	-4.57e-06*** (1.15e-07)	-4.57e-06*** (1.15e-07)	-4.57e-06*** (1.15e-07)	-4.57e-06*** (1.15e-07)	4.59e-05*** (2.51e-06)	-8.300*** (2.51e-06)	-1.54e-05*** (1.01e-06)	-1.54e-05*** (1.01e-06)	-1.54e-05*** (1.01e-06)	-1.54e-05*** (1.01e-06)	-2.02e-06*** (1.98e-07)	-2.02e-06*** (1.98e-07)	-2.02e-06*** (1.98e-07)	-2.02e-06*** (1.98e-07)
presence of partner	3.432*** (0.0736)	3.432*** (0.0736)	3.432*** (0.0736)	3.432*** (0.0736)	3.432*** (0.0736)	3.432*** (0.0736)	5.758*** (0.171)	5.758*** (0.171)	5.758*** (0.171)	5.758*** (0.171)	5.758*** (0.171)	5.758*** (0.171)	5.077*** (0.267)	5.077*** (0.267)	5.077*** (0.267)	5.077*** (0.267)
education	-0.0247*** (0.00973)	-0.0247*** (0.00973)	-0.0247*** (0.00973)	-0.0247*** (0.00973)	-0.0247*** (0.00973)	-0.0247*** (0.00973)	0.597*** (0.0276)	0.597*** (0.0276)	0.597*** (0.0276)	0.597*** (0.0276)	0.597*** (0.0276)	0.597*** (0.0276)	-0.124*** (0.0375)	-0.124*** (0.0375)	-0.124*** (0.0375)	-0.588*** (0.0321)
Constant	29.18*** (0.0466)	29.30*** (0.0478)	23.42*** (0.299)	24.78*** (0.304)	28.16*** (0.450)	29.21*** (0.484)	24.15*** (0.849)	5.766*** (1.039)	29.41*** (0.314)	31.09*** (0.317)	31.67*** (0.986)	36.44*** (1.043)	84.54*** (2.445)	82.14*** (2.475)	86.46*** (2.547)	72.92*** (2.662)
Observations	548	548	548	548	330	330	330	330	218	218	218	218	243	243	243	243
R-squared	0.000	0.001	0.045	0.058	0.003	0.004	0.065	0.094	0.004	0.027	0.153	0.157	0.023	0.025	0.116	0.132
Effect at Cutoff	0.679	0.969	1.120	0.863	3.503	3.308	3.462	3.454	2.856	14.15	14.91	14.90	-9.901	-11.69	-8.387	-5.484

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: The variable “qchild_under_agechildcare” refers to the number of children that are too young to receive childcare. Similarly “qchild_of_agechildcare” and “qchild_over_agechildcare” refer to the number of children, in the household, in age to receive the childcare program and too old to receive childcare, respectively. Each observation is weighted according to the expansion factor of the ENAHO. The effect at cutoff is calculated as the sum of the parameter of D and the parameter of $D * sc_{1k}$ times the cutoff. The cutoff level is 20 for CENCINAI and 60.5 for IMAS. OLS regressions. Robust errors in parenthesis. ***p<0.01, **p<0.05, *p<0.1.

Sources: Own elaboration from ENAHO data.

10 Conclusions

In this paper the effects of CENCINAI and IMAS programs on labor market outcomes, school attendance and unpaid domestic work of women have been analyzed. The main results can be summarized as follows: The CENCINAI program -the larger of the two- does not seem to have an effect on labor market outcomes (labor force participation, hours worked and full time jobs) while it seems to have a positive effect on school attendance and unpaid domestic work. In contrast, the IMAS program seems to have a positive effect on labor market outcomes and school attendance but not on unpaid domestic work.

A plausible explanation, for these different results across programs, relates individual incentives with the weight each program puts on being poor in order to be eligible. The CENCINAI score takes into account fewer variables than that of the IMAS, and weights more heavily to be poor in order to have access to the benefits. But this can create a perverse incentive. A woman who is making use of the program and finds a job that pays well enough as to move her out of poverty might find herself out of the benefits. Thus, in order to keep the benefits, participants have an incentive not to find a job that might get them above the poverty line. The IMAS program might mitigate this perverse incentive since it takes into account a broader range of variables in order to classify potential beneficiaries. Although plausible, this explanation has to be tested formally, task that is out of the scope of this paper.

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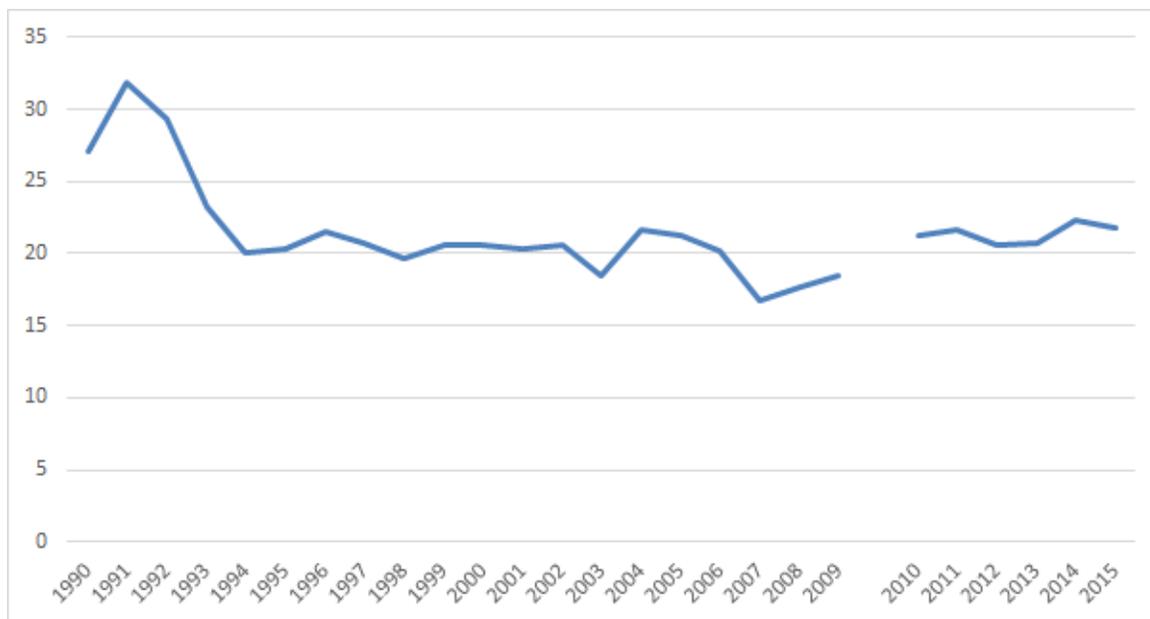
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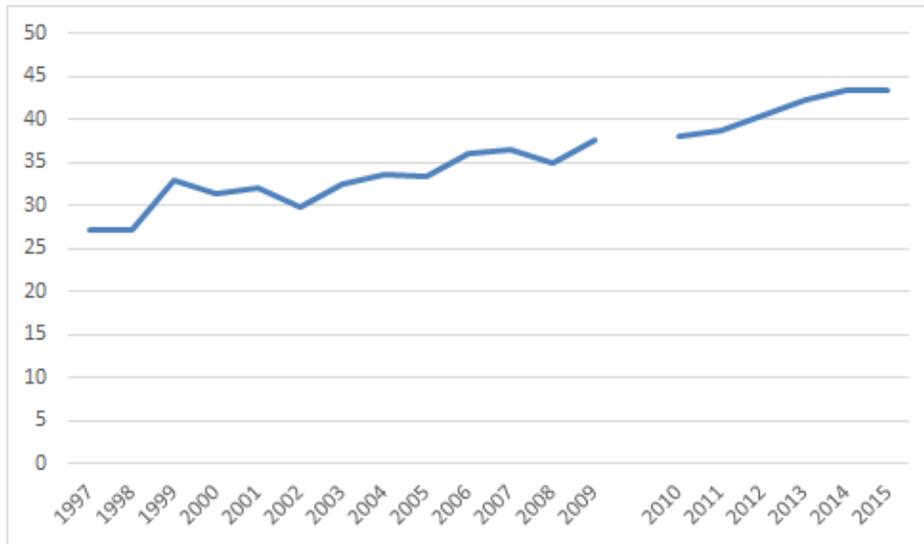
11 Appendix

Figure 17: Costa Rica: Poverty Rate, 1990-2015



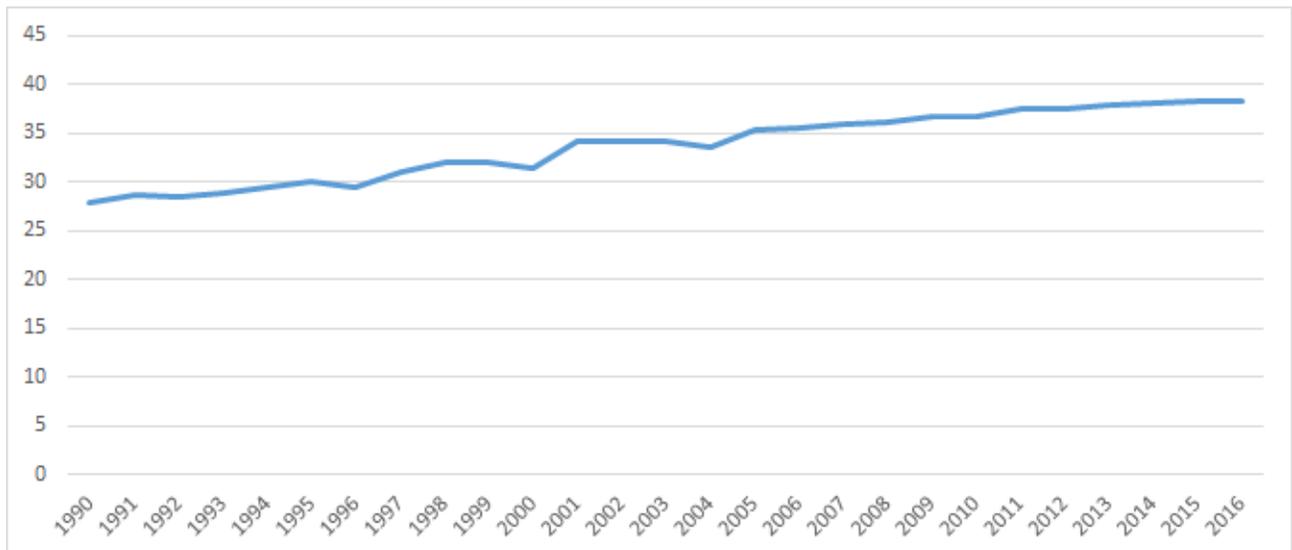
Source: Social Compendium 2016, Estado de la Nación, Costa Rica. Note: There is a change of survey design from EHPM (2009) to ENAHO (2010).

Figure 18: Costa Rica: Share of Poor Households Headed by Female, 1996-2015



Source: Social Compendium 2016, Estado de la Nación, Costa Rica. Note: There is a change of survey design from EHPM (2009) to ENAHO (2010).

Figure 19: Costa Rica: Female Labor Force Participation Rate, 1990-2016



Source: World Bank, World Development Indicators 2017