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Intra-Household Behavioral Responses to Cash Transfer Programs: Evidence from a Regression Discontinuity Design

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ABSTRACT

Intra-Household Behavioral Responses to Cash Transfer Programs: Evidence from a Regression Discontinuity Design[*]

This paper investigates the behavioral responses of coupled men and women to a cash transfer program in Uruguay – Asignaciones Familiares-Plan de Equidad (AFAM-PE) –, by analyzing its effect on labor market responses, marital dissolution, and the decision-making process regarding the use of money. The identification strategy exploits both the fact that the monetary transfer is targeted to women and a local random assignment into the AFAM-PE which exogenously changed the intra-household distribution of resources across applicant households. Based on a regression discontinuity design and on a follow-up survey matched with administrative records of applicant households to the program, the insights of this study may be summarized in four broad results. First, while no significant effects are found for men, the program has significant negative effects on the formality choice of women at the eligibility cut-off, but no robust effect on the margin of employment. Secondly, these responses seem to be associated with a decline in women's movement into formal labor from unregistered jobs. These responses do not depend on their partner´s labor supply. Third, contrary to findings for various welfare programs in developed countries, no effect on marital dissolution is found. Fourth, we find suggestive evidence that the AFAM-PE results in women taking greater (perceived) responsibility for decisions in specific spheres of household expenditures. In conclusion, considering the overall effects, these results suggest that conditional cash transfer programs (CCTs) do not necessary imply an increase in women's control over household resources, offering suggestive considerations for the ongoing debate in developing countries and suggesting the need to discuss new designs for social assistance.

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1   Introduction

The main type of social assistance in place in developing countries is the conditional cash transfer (CCT) program. These programs grant monetary payments to poor households provided that its members meet certain conditionalities; their aim is to alleviate poverty while, at the same time, breaking the intergenerational transmission of poverty. In the years since CCTs were introduced in the 1990s a number of studies have examined their results and assessed their success. This research has shown that CCTs have led to unprecedented declines in poverty rates (e.g. Fiszbein & Schady, 2009), and improvements in education, (e.g. Glewwe & Kassouf, 2012), nutrition, and health (e.g. Gertler, 2004; Barham, 2011); the programs do not appear to significantly reduce labor supply (e.g. Alzúa et al., 2013), although they may have an impact on labor formality (e.g. Bérgolo & Cruces, 2016) and transitions from formal into informal employment (e.g. Garganta & Gasparini, 2015).[1] Most of the existing literature, however, has generally focused on the behavioral effects of CCTs and considered the household implicitly as a single unit. Thus, we know much less about the programs' impacts on intra-household outcomes, even when the benefits of such social policies are assigned to specific adults within a household rather than to a unitary household unit or in equal proportion to all family members.

In order to achieve their objectives, many CCT programs are designed so that payments are made to the mother (or to the female head) of the household. This common feature is based on arguments that women are more efficient in managing resources (as compared to their male counterparts) and that they use money to improve the well-being of children (Thomas, 1990; Duflo, 2003). Thus, gender-based targeting raises a range of questions that have remained unanswered, including the intra-household distributional effects of CCT programs.

This paper helps to close this gap in the literature by considering individuals in couples and analyzing the extent to which a gender-based targeting CCT program in Uruguay –*Asignaciones Familiares- Plan de Equidad* (AFAM-PE)- affects economic and social outcomes within the household. Specifically, we study the impact of the program on women and men's labor market responses by examining their participation in terms of employment and hours of work, as well as their formal employment decisions, and the couples' decision-making processes.[2] Investigating behavioral responses at the household level provides a more complete picture of the consequences of CCTs and it allows one to explore the presence of unintended effects, including efficiency loss due to labor market decisions. These unintended effects may be crucial for the long-term success of this type of social policy and may have important implications for new policy designs.

Economic theory suggests a number of predictions, *a priori* ambiguous, about how households might respond to the incentives of CCTs in different economic and social areas. The predicted effects depend on which household theory we use as a reference. A standard unitary model of a household suggests that members pool resources; that is, it suggests that only the total family income affects household demand. In this framework, it is irrelevant which household member controls income as this would have no bearing on the allocation of family resources and labor decisions (see review by Lundberg & Pollak, 1996). Consequently, one would expect that the monetary transfer targeted to women of beneficiary households would not have distributional effects on individual family members' outcomes. In contrast to the unitary model, a growing literature has attempted to incorporate divergent preferences within a household and to model household decision-making as a process of bargaining in which the family's outcomes are affected by the distribution of power within the household (see e.g. Chiappori, 1988, 1992; Lundberg & Pollak, 1994). Thus, these models predict that the gender-based targeting of CCTs could generate changes in the distribution of resources within the household and thus could affect the

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[1] For a survey of the impacts of CCTs on several individual and household domains, see Fiszbein & Schady (2009).

[2] Registered or formal jobs, in contrast to unregistered (or informal) jobs, are defined in this article as those registered with the Social Security Administration, for which payroll taxes are payed and social insurance benefits are provided.

bargaining power of its members and impact their outcomes differently.

A major challenge in the empirical study of intra-household distributional effects is how to obtain an exogenous source of variation in elements which might affect (indirectly) the choices of individuals. A social transfer policy like the AFAM-PE program, which redistributes resources within a household, offers an excellent opportunity to address that concern. In particular, this study takes advantage of the local random assignment of applicant households into the program, which exogenously alters the distribution of non-labor income within the household. The eligibility rule for AFAM-PE entails computing a predicted income score for applicant households based on their baseline socioeconomic characteristics. Only those applicant households with an income score above a determined threshold are eligible for the AFAM-PE, which generates a strong discontinuity in the probability of being assigned into the program. Once eligible, the monetary transfer is issued to the mother of the children (or female head of household). According to the administrative records of the program, over 90% of those who are entitled for the benefits are women.

Based on a sharp regression discontinuity design (RD) and on a follow-up survey matched with administrative records of applicant households, this study analyzes the effect of the program on household behavior by comparing outcomes of couples closely above (i.e., the treatment group) and below (i.e., the comparison group) the program eligibility cut-off.

The insights from the RD analysis may be summarized in four broad conclusions. First, the AFAM-PE affects the labor market behavioral responses of coupled partners in beneficiary households. However, responses are mostly found among women. In particular, RD estimates provide evidence that the program significantly reduces maternal registered employment by 17- 21 percentage points at the eligibility cut-off and increases women's likelihood of non-employment, although this result is not robust across estimations. A possible explanation of the small and insignificant program effects found on the labor supply of men is that their income elasticity of leisure is on average close to zero, as suggested by previous studies focused on similar populations (Bosch & Manacorda, 2012). On the other hand, the absence of a robust effect of AFAM-PE on women's employment suggests that the pure income effect of the transfer may be counterbalanced by other factors. For example, the increase in the redistribution of power might allow women in couples to overcome traditional gender roles and increase their labor supply, as suggested by predictions of non-cooperative bargaining models. Second, the negative effect on women's registered employment seems to be associated with changes in transitions between informal and formal employment. In particular, the estimates show a decline in the number of women who move to formal jobs from informal work. Third, we do not find significant heterogeneity in the responsiveness to AFAM-PE incentives according to a woman's partner's employment status. Fourth, when we focus our empirical analysis on other domains of household decisions aside from labor market choices, we find relevant responses. We do not find evidence to suggest that the AFAM-PE alters the probability of union dissolution among couples in beneficiary households, but becoming a benificiary of the CCT program does appear to affect women's (perceived) ability to take part in the decision-making process of their household, specifically in matters related to spending money. Women heads of household are 12 to 19 percentage points more likely to make decisions regarding food expenses after they became eligible for the AFAM-PE. This increase is explained by a decrease in both the probability that other adult household members make decisions related to food expenses, the probability that decisions are made jointly by both partners. It is also consistent with the suggestion that, by targeting women as recipients of the transfer, the program is improving their position in household decision-making processes. Robustness analysis does not provide evidence to reject the validity of the assumptions underlying the RD estimates.

This paper contributes to a burgeoning literature that examines the effects of CCT programs' gender-based targeting on intra-household behavioral responses in four ways. First, it joins a small but growing number of studies that analyze the effect of CCT programs on labor market behavior (see Bosch &

Manacorda, 2012, for a recent survey). However, most of the existing studies that examine this subject analyze labor supply responsiveness by considering the household as a single unit (see e.g. Alzúa et al., 2013; Bérgolo & Cruces, 2016). This paper, therefore, represents one of the first efforts to analyze the distributional effects of CCT programs on different household members' labor market decisions. As in Novella et al. (2012), the results in this paper suggest that such programs alter parents' labor market decisions differently. Unlike Novella et al.'s work, this study considers the effect of CCTs on both parents' registered employment choices and finds that the margin of response to monetary incentives is very relevant, as one would expect in a context of limited enforcement capacity. These findings suggest that the AFAM-PE reduces beneficiaries' incentives to actively search for registered employment, a conclusion that is consistent with evidence found for other CCT programs in the context of medium-high informal labor markets (see e.g. Garganta & Gasparini, 2015). In addition, the household´s responses regarding registered employment is consistent with the prediction that the secondary worker – i.e. usually the mother-, is the household member most likely to react to the financial incentives of the AFAM-PE program on this margin (see e.g. Galiani & Weinschelbaum, 2012).

Second, the literature finds that delivering monetary transfers to the mother (or female head of household) affects female bargaining power (Attanasio & Lechene, 2002; Handa et al., 2009; De Brauw et al., 2014), the marriage, and the allocation of household resources towards investment in family well-being, in particular towards the children (Djebbari, 2005; Schady & Rosero, 2008; Bobonis, 2009). This study contributes to this literature by providing evidence on household members' responses to AFAM-PE in other domains besides labor market behavior, including decisions regarding marriage, dissolution of partnership, and decision-making dynamics regarding the use of money.

Third, a sizable literature examines different representations of intra-household decision-making by empirically testing how household members pool resources. Traditionally, the literature has used changes in labor income or pre-couple-formation of non-labor income as indicators of variation in the distribution of resources within a household. Examining such changes permits one to estimate the extent to which a household pools its income (see Thomas, 1990; Browning et al., 1994; Fortin & Lacroix, 1997). However, this approach has methodological limitations that curtail its usefulness and its application to policy. For these reasons, the literature is moving towards tests of household models that exploit experimental or quasi-experimental variations in the distributions of household resources (Lundberg et al., 1997; Attanasio & Lechene, 2002; Duflo, 2003; Rangel, 2006; Bobonis, 2011; Martinez, 2013). This paper adds to this literature by examining a public policy that alters the distribution of non-labor income in the household and estimating how the family's outcomes are affected by the new distribution of resources.

Finally, our findings offer important considerations for the ongoing policy debate in developing countries regarding social assistance programs' gender-based-targeting design and the subsequent effects of those programs on beneficiaries. Despite the improvements in family well-being and in women's roles in household decision-making, CCT programs demonstrate a disincentive effect regarding labor market decisions; ignoring this disincentive could lead one to substantially miscalculate the policy's overall impact on women's well-being and economic empowerment.

The rest of this paper is organized as follows. Section 2 provides a brief review of the evidence on household responses to transfer programs and also provides institutional background information. Section 3 presents the theoretical background. Section 4 describes the data used and the identification strategy. Finally, Sections 5 and 6 present the results and principal conclusions.

2 Background

2.1 Evidence on household behavioral responses to transfer programs

Several recent studies have used quasi-experimental approaches to analyze the impact of programs that alter a member of a household's non-labor income. Eissa & Hoynes (2004) examines the labor force participation response of married couples when the Earning Income Tax Credit (EITC) was expanded in the United States, between 1984 and 1996. Using a difference in difference (DID) approach, the authors found that the EITC reduced total family labor supply. Consistent with the theoretical predictions of the secondary earner model, they found that married women reduced their labor force participation as compared to single women with children in response to the EITC expansions. Francesconi et al. (2009) also used a a DID strategy to analyze the effect of the 1999 reform to the Working Families Tax Credit (WFTC), Britain's main assistance program for low-income families with children. The authors found strong employment effects for women in two-parent households in which the male partners did not work or worked less than 16 hours per week. For these women, the program had an effect of increasing the probability of their working more than 16 hours by 3%, and of their working full time by 2%. These results are similar to those found for single mothers and are in line with the incentives introduced by the reform.

Studies on developing countries have largely focused on analyzing the effects of CCT programs and monetary-transfer pensions for vulnerable families. Novella et al. (2012) exploits the experimental design of three different CCT programs -the Programa Asignación Familiar (PRAF) in Honduras, PROGRESA in Mexico, and Red de Protección Social (RPS) in Nicaragua-, to analyze how the structure of power within the household affects the parents' labor responses in the case of each program. The study uses experimental variation and a DID approach and finds that the CCT programs affect both of the parents' labor supply, and that this effect is associated with the distribution of bargaining power in the household.

Bertrand et al. (2003) analyze the effects of a pension program in South Africa on the labor supply of all individuals of working age who live in a households with an older adult beneficiary. They find evidence of a causal effect of the program on the number of hours worked by household members of working age, and show that the effect is greater for men than it is for women. The authors also demonstrate that the pension of an elderly woman has a greater negative effect than that of an older man. They argue that this finding is inconsistent with the theory of a common budget (income-pooling hypothesis) among extended South African families and raises evidence against a model of common preferences in the allocation of labor supply (unitary model of the household). Duflo (2003) studies the same program and assesses the impact of the pension program on the elderly in South Africa and compares subsequent effects on children, by gender of the beneficiary. Evidence indicates that pensions received by women increased the weight and height of girls in the family, but does not have the same effect for boys. Therefore, this study suggests that the pension program incurred very different effects depending on the gender of the beneficiary, and was effective only if it was received by young girl's grandmother. Martinez (2013) used an exogenous variation created by a law that increased child support for out-of-wedlock children and employed a DID design to find a decrease of 1.8 percentage points in fathers' employment as well as a decrease in their number of hours worked. The author notes that the results reject the unitary household model because changes in bargaining power imply changes in household outcomes. Rangel (2006) analyzes a law that extended the alimony rights for cohabitants in Brazil and finds evidence of reduction in hours worked by female heads and a redistribution of household resources toward schooling for teenage girls. The author states that the results provide empirical evidence of intra-household female empowerment and that they negate a unitary representation of the household.

Few studies have been conducted on the impact of cash transfer programs on marital transitions

and existing evidence is not conclusive. Francesconi et al. (2009) found significant evidence that the introduction of the WFTC led to an increase in the rate at which women in low-income households dissolved their marriage. Bobonis (2011), who uses experimental data to analyze the impacts of Mexico's PROGRESA program on marital dissolution and the formation of new unions, found that the overall share of women in marital unions did not change as a result of the program. However, the author found suggestive evidence that marital turnover increases as consequence of the program. In particular, while separation rates increases, the eligible mothers in no-relationship at baseline increased cohabitation or marital union formation rates.

Given the gender-based targeting of CCT programs and the interest in increasing women's empowerment in developing countries, a small but growing number of studies have begun to assess whether the monetary transfers targeted to women have heightened their roles within the household. Using experimental data on PROGRESA, Attanasio & Lechene (2002) find evidence of a shifting effect from decisions made solely by men to decisions made jointly by men and women across several domains of household decision-making. In line with these findings, Handa et al. (2009) show evidence that PROGRESA has had an impact on women's ability to spend their own money, although they do not find evidence of such an effect on other kinds of household decisions. De Brauw et al. (2014) examine Brazil's Bolsa Família program and find that women in beneficiary households increase their control over contraception decisions. They find that women in urban areas (only) acquire greater control over decisions regarding their children's well-being, including school attendance and heath.

2.2 The Asignaciones Familiares-Plan de Equidad Program

The AFAM-PE, approved in December 2007 (Law 18.227), is the most important social assistance program, both in terms of coverage and cash benefits, directed at poor-income families with children in Uruguay.[3] This program targets households in vulnerable socioeconomic conditions that include either a pregnant mother or a child under 18 years of age. Monetary transfers to beneficiary households are conditioned on the family meeting several requirements, including school attendance and regular health check-ups. At the beginning of 2008, the AFAM-PE transfers covered 275,000 children from vulnerable households. In 2014, the program reached nearly 370,000 children in poor and vulnerable households, a figure that corresponds to 42% of children under the age of 18 in Uruguay.[4] The budget for the cash transfer component of program in 2013 was just over 0.35% of Uruguay's GDP.[5] The coverage and the budget of the AFAM-PE make it among the most important programs in Latin America.[6]

2.2.1 Application, eligibility and structure of benefits

To acquire the AFAM-PE, households must complete an application (referred to as the baseline survey in our study) which captures an array of socioeconomic data, including: household characteristics, education, labor market participation, condition and ownership of living space, and income. To be eligible, household applicants must pass a combination of income and proxy-means testing. First, the household per capita income level must be below a predetermined threshold (i.e., the income test). In 2014, this threshold was UYU 4,517 (USD 196, exchange rate June 2014) for household with two or less members

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[3]For an analysis of the evolution of the Family Allowances system in Uruguay, see Arim et al. (2009).

[4]Own estimate based on microdata from the Continuous Household survey of the National Institute of Statistics (ECH-INE 2013)

[5]The information on AFAM-PE´s budget was facilitated by the staff of the Ministry of Social Development (*Ministerio de Desarrollo Social*, henceforth MIDES).

[6]By comparison, Bolsa Familia reaches almost 24% of the population of Brazil, with a budget of 0.4% of the GDP in 2006; Progresa/ Oportunidades covered 20% with a budget of 0.4% of the GDP in 2006, PRAF in Honduras covered 15% of the population with an investment of 0.2% of the GDP in 2001; Chile Solidario covered 6% of the population using 0.1% of the GDP in 2001; Familias en Acción in Colombia covered 5% with 0.1% of the GDP in 2005; and RPS in Nicaragua covered 3% at 0.2% of the GDP in 2005 (Bastagli, 2009).

and UYU 5,570 (USD 242) for households with more than two members, respectively. The household income used for the income test is calculated as the highest number reported on either self-declared income (on the application) or from registered sources of labor income and other social security benefits reported to the Social Security Administration (*Banco de Previsión Social*, henceforth SSA). Once the applicant household passes the income-testing, participation in the AFAM-PE is determined through a predicted income score (known as the *"Indice de Carencias Críticas"*) that is based on the large set of socioeconomic characteristics provided by the household in the baseline survey (i.e., the proxy-means test).[7] The income score ranks the applicant households; only those with a score above a certain threshold are eligible to enroll in the AFAM-PE program– provided that they have at least one pregnant woman or a child younger than 18 years old in the home.[8] Households were informed that they would be taken out of the program if they were determined to be eligible but had income reported to the SSA that showed that they exceeded the income threshold during the course of participation in the program. Thereby, the SSA routinely performs the income test (every two months during this study's period of analysis) on enrolled households. However, once the applicant household has enrolled in the program, the income verification test is based only on verifiable sources of the household's income, i.e., labor income from registered employment, retirement pensions or other government transfers recorded in the SSA administrative records.

The monetary transfer is delivered monthly, varies in accordance to the number of children in the household, and increases when the child attends secondary school.[9] The amount is adjusted on an equivalence scale. The total benefit granted to a household can be calculated thus:

$$AFAM - PE_h = \beta \times (kids18)^{0.6} + \delta \times (kids18sec)^{0.6} \qquad (1)$$

In which $kids18$ is the number of children under 18 years of age in the household who comply with eligibility conditions, $kids18sec$ is the number of children that attend high school, β and δ are the amounts granted according to level of education. These amounts are adjusted periodically according to the evolution of the Consumer Price Index (IPC). In 2014 β =UYU 1,096 (USD 48) and δ = UYU 470 (USD 20). The average income transfer for a beneficiary household with two kids in 2014 was UYU 2,374 (USD 103), about 25% of the monthly national minimum wage.

The recipient of the cash transfer is usually the children's mother or the woman in charge of the children. According to the administrative data of the program, approximately 90% of benefit recipients are women (usually the children's mother). Preference is given to women recipients because studies show that women are most likely to use additional income towards the well-being of the family. Households lose the benefit if they do not comply with the conditionalities of the program (schooling and health controls) or if they do not pass the proxy-means test. Once a household qualifies for the AFAM-PE, it receives the benefit until the youngest child turns 18 years old, provided members continue to meet program requirements.

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[7]The predicted income score was developed by researchers at the University of the Republic (see Amarante & Vigorito, 2011). The income score estimates are based on a probit model that measures the probability of being under a critical threshold of income per capita. To obtain this result, a function that uses many household variables is applied, based on the baseline survey. The task of calculating the score and monitoring the households that comply with regulations falls to the SSA and the MIDES. To avoid any type of manipulation, households have not been told how eligibility is determined, nor what specific variables are used for the model, its variations, or the specific eligibility thresholds. Additionally, MIDES conducts visits to households so as to verify that the information is provided reflects reality.

[8]Two different thresholds were used, one for Montevideo (the capital of Uruguay) and one for the rest of the states of Uruguay.

[9]The transfer includes an amount destined to disabled children regardless of whether they attend school.

2.2.2 Assignment rule and discontinuity in the program participation

As was previously described, for those households under the income threshold, eligibility to the AFAM-PE is determined as a function of a predicted income score based on household pre-treatment characteristics. Only households with a score that falls above the predetermined threshold are eligible. This eligibility rule generates a discontinuity in the probability of participation in the program at the cut-off point. The Figure 1 plots the proportion of household applicants that were enrolled in the program at any given point in time since its implementation in 2008, presented as a function of the predicted income score. The data corresponds to applicant households that are part of the universe of analysis and comes from the administrative records of the program (described below).[10] The predicted income score is normalized at the eligibility threshold and divided into intervals.[11] Visually, the probability of participating in AFAM-PE is approximately 98% greater for households with a score above the threshold.[12] Hence, Figure 1 clearly shows that the mechanism to determine eligibility for AFAM-PE based on the score creates a very strong discontinuity in the likelihood of participation at the eligibility cut-off point. Thus, our empirical analysis exploits this quasi-random assignment into the program and compares the behavior of adults in (two-parent) eligible households and non-eligible households near the discontinuity point. Section 4.2 below addresses a few caveats, the identification strategy and the robustness tests used to validate the comparison.

3 Household economic and social behavioral responses to cash transfers

The AFAM-PE program increases the non-labor income of eligible households by transferring money to the mother or female head of household. The economic theory suggests a number of predictions, *a priori* ambiguous, about how households might respond to the program on different economic and social domains. These predicted effects depend on which household theory we use as reference.

   The unitary model of household behavior relies on the assumption that the household makes decisions as a single agent. Unitary household models represent decisions, made either by the power of consensus (Samuelson, 1956) or by a "benevolent dictator" Becker (1981), as a representative utility function based on a set of common preferences and a common aggregate budget constraint. Therefore, in this model, household choices are either based on an agreement regarding the utility function derived from each choice or are made by an altruistic dictator who represents the tastes and preferences of household members and maximizes utility for the whole family. A central prediction of the unitary model is that decisions are only influenced by the household's pooled income. This would imply that income allocation across family members does not influence time and expenditure decisions. Therefore, under the hypothesis that the household functions as a single decision unit, the question of who receives the income–the mother in the case of most CCT programs– should not have distributional effects on the household allocations of its members (the income is "pooled").

   Since the 1980s, the unitary model of household has been increasingly criticized from both theoretical and empirical perspectives.[13] Though the literature offers no consensus regarding alternative models

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[10]The data corresponds to the period from January 2008 to September 2010 and includes applicants households (eligible and non-eligible); it was used to design the follow-up sample, which aimed to evaluate the program impacts (see section 4.1).

[11]The eligibility threshold corresponds to the year 2010. In general, this figure (and the remaining figures) are centered on zero, so that the standardized income score increases as it moves from left and right along the horizontal axis. Each point, (black circle) represents the percentage of applicant households that participate in the AFAM-PE at each interval of the standardized predicted income score. Additionally, the data is adjusted using a first grade polynomial on each side of the discontinuity.

[12]This first-stage effect is formally estimated in a regression framework and reported in section 5.

[13]See, Manser & Brown (1980); McElroy & Horney (1981); Folbre (1986); Mencher (1988); Sen (1990); Thomas (1990);

to analyze household decision-making processes, all the new approaches–cooperative, non-cooperative, collective, or some combination of the three –characterize decision-making as a bargaining process (for a survey, see Xu, 2007). These models predict that changes in the distribution of resources within the household will affect the bargaining power of its members. In this context, policies that alter intra-household allocation of resources can generate distributional effects across household members. In this case, the gender-based targeting of the cash transfer can affect the male and female partner differently; the results will depend on the solution to the bargaining problem. The main characteristics and implications of two of the more salient non-unitary models, the intra-household bargaining and collective decision-making models, are presented in Appendix A.1.

Making the female head of household the primary recipient of an external cash income benefit can have a positive impact on her bargaining power in the home through three channels: a better position of rupture, a clearer perception of their individuality and wellness, and a greater perceived contribution to the economic position of the family. This model raises the issue of how the bargaining power of individuals should be defined. Usually, bargaining power is evaluated using a number of factors, among which the most relevant is the threat point or fall-back position: the external options that an individual will face if the bargaining process fails. Factors that affect a spouse's opportunities outside the marriage can influence the intra-household balance of power and the final allocation of resources, even if the marriage does not actually dissolve (Chiappori et al., 2002). The fall-back position indicates the strength of the person in the bargaining process. If in case of a break in the bargaining process a person ends up in a worse situation, his or her ability to achieve a favorable outcome as a result of the bargaining process would be weakened.[14] Relative incomes and the distribution of total intra-household income play an important role in defining the bargaining strength of each member.[15]

Other elements affecting bargaining power include perceived interest and the response to the perceived contribution. If the perception of self-interest of one of the individuals who take part in negotiating makes him/her assign a lower value to his/her own well-being, then, from the point of view of welfare, the collusive solution would be less favorable to that person. On the other hand, if the individual is perceived to make a greater contribution to the overall wealth of the household, then the negotiation should be more favorable (Sen, 1990; Agarwal, 1997).[16]

As there is a relation of simultaneity between employment and economic empowerment[17], a critical element when testing models of household is the need for a source of exogenous variation in the bargaining power. In this case, this policy offers a redistribution of resources within a household that serves as an external source of variation.

In the following subsections, we discuss the implications of this social assistance program for the different social and economic outcomes considered in this study: labor supply decisions, formalization, decision-making process regarding the use of income, and couple formation.

Bourguignon et al. (1995); Browning et al. (1994); Agarwal (1997); Udry (1996).

[14] The answer to rupture is a general qualitative property of cooperative conflict (Sen, 1990).

[15] These are not the only possible variables that may affect the intra-household decision-making process. Factors like the sex ratio, laws regulating alimony, programs conditional on marital status, support orders and the right to re-marry, as well laws regarding marital property and its division at divorce, are also relevant factors to consider (Chiappori et al., 2002). Even social networks, religious or other general sociocultural norms can be considered among the distributional factors.

[16] In particular, perceptions of each member's contributions to the household may depend on how "visible" their work is. Work done at home or unpaid work is commonly seen as less valuable than other monetary contributions to household. Similarly, perceptions of needs may differ from actual needs. The systematic underestimation of the contributions and needs of women and girls in a system where these are considered important distributive principles reinforces gender discrimination in the allocation of resources in the home (Agarwal, 1997).

[17] The quality of the labor market employment affects the economic empowerment of women. However, on the other hand, it is likely that the higher quality employment that a woman has, the higher her level of decision-making power and control over economic decisions; therefore, women's economic empowerment impacts the results they can achieve in the labor market.

3.1 Labor market decisions

3.1.1 Labor supply

Under the standard unitary model of the household, the AFAM-PE cash transfer alters the trade-off between household consumption of leisure and labor supply by relaxing budget constraints. Therefore, if leisure is a normal good, the combination of the income effect of the benefit and the price effect induced by means testing unambiguously leads to a predicted reduction in household members' labor supply.[18] Since in the unitary model the distribution of total non-labor income across family members plays no role in determining individual labor supply, delivering the AFAM-PE benefit to the female head of household should not affect the labor decisions of the male and female heads of household differently. Such a prediction would be based on the assumption that the AFAM-PE does not affect the weights assigned to women and men's preferences in the household welfare function. That is, if we follow this model, we would assume that the AFAM-PE would not affect household allocation decisions.

However, if we employ a bargaining model, a woman's unearned income affects labor supply not just through the income effect but also through her ability to make decisions regarding the use of money. Therefore, policies that alter the distribution of resources in the household can affect members' labor supply decisions differently. In this case, directing the cash transfer program at the female head of household (in the event of outside marriage opportunities) should correspond to an improvement in her position in negotiations and *via* this increase in bargaining power, affect the intra-household bargaining process and the allocation decisions among partnered couples. In this case, an increase in female bargaining power should have an effect on women's labor supply, although the expected effects are ambiguous and depend, among other factors, on which bargaining model we take as reference, as well as on women's preferences.

On the one hand, an increase in the female head of household's bargaining power might decrease both her labor force participation and working hours (a pure income effect) and lead to an increase in either consumption of leisure or time spent in unpaid housework - e.g. bringing children to school in order to fulfill the AFAM-PE conditionalities. This result is compatible with the predictions of the collective models of the household: in a collective household, the social planner maximizes a weighted utility of the couple, and as that weight goes up, the planner increases her leisure and makes her partner work more (McElroy & Horney, 1981).

On the other hand, an increase in her negotiation power might allow the female head to overcome traditional gender roles and increase her labor supply. A woman's unearned income can increase her labor supply by increasing her autonomy, which would subsequently increase her gains from working. This result is compatible with predictions for non-cooperative bargaining models. These models differ from the collective models by the decision-maker. Under the non-cooperative model, the female head of household maximizes her utility and controls only her choices; thus, as her bargaining power goes up, she cannot make her husband work more, but instead she can increase her own labor supply in order to gain more from her increased bargaining power (Lundberg & Pollak, 1994; Anderson & Eswaran, 2009).

Regarding men's labor market choices, the increase in his partner's bargaining position within the household should lead to a increase in male labor supply via a standard income effect under either cooperative and non-cooperative household models.

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[18]Fulfilling the conditionalities for the program might also affect household labor supply decisions by altering the associated time costs, including parental time dedicated to childcare. In this case, the theoretical prediction on labor supply response is ambiguous and the direction of the effect depends on whether or not there was an increase in the associated cost of fulfilling the conditionalities for the household's adults

3.1.2 Formal employment

In addition to the standard margin of labor supply responses, the AFAM-PE program may also affect participants' decision to work as registered or as informal employees. This question is relevant for beneficiaries who were previously employed as well as those who were not employed, i.e. the formal-informal employment margin. If informality is a voluntary decision, workers may choose to engage in informal employment because they place less value on the social insurance benefits tied to registered jobs and seek to avoid the related payroll taxes and contributions (Maloney, 1999, 2004; Levy, 2008). Given this, in contexts where tax and labor regulations are weakly enforced, as is the case in developing countries, informal employment results in "better pay" (*ceteris paribus*) among other benefits.[19] In the context of this sorting model approach, AFAM-PE's benefits and eligibility rules alter the cost-benefit valuation of formal work at the margin. For instance, the AFAM-PE´s income testing might affect behavioral responses on informality decisions of adults as it introduces an implicit high marginal tax rate for earnings from registered employment.

Theoretically, however, the effect of the AFAM-PE on unregistered employment is ambiguous (Bosch & Manacorda, 2012). On the one hand, the benefit might push some individuals previously in formal employment towards unregistered jobs due to a "switching effect" induced by the income testing. On the other hand, for some (infra-marginal) individuals who held unregistered employment prior to the program, the cash transfer may have a negative income effect, pushing them out of employment. Thereby, while the expected effect of the program is a decrease in registered employment (due to a negative income and switching effect), the effect on unregistered employment depends on the relative strength of the switching and income effects.

While the discussion has thus far referred to overall effects, the AFAM-PE may introduce differential incentives in labor market household decisions between the primary and secondary workers. Secondary workers are more likely to be employed informally (*ceteris paribus*) than primary workers, due to the fact that they already enjoy some of the primary workers' social insurance benefits (e.g. in Uruguay, a health insurance benefit covers all of the formal worker´s immediate family) if they are formally employed. As a consequence, although the implicit taxation of the AFAM-PE income-testing on formal sources of income should reduce the likelihood that both adults in a household are formally employed, this behavioral response would be expected to be higher among secondary workers, i.e. female heads of households, relative to the primary workers (e.g. Galiani & Weinschelbaum, 2012).[20]

3.2 Decision-making process

The proportion of income that each member contributes to the household income has the possibility of affecting the decisions made within the household, in particular regarding the use of money (Duflo, 2012). When welfare agencies decide to transfer money to the female head of household on the basis that they are most likely to use it to the benefit of the family, they implicitly recognize that women are not completely powerless when it comes to household decisions. If women did not hold sway, the money would be appropriated immediately by their male partners and thus, targeting the transfer to women would have no effect. Duflo (2012) states that there are good reasons to believe that, in practice, real families operate with some modicum of power sharing. Family members have different ideas about the

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[19]An alternative view, the "traditional approach", based on Harris & Todaro (1970), posits that informal workers are those rationed-out from scarce (and "good") formal jobs. In the context of segmented labor market models, a program such as AFAM-PE would not have a discernible effect on the formality-informality margin.

[20]Follow-up survey data shows that in married-couple families, secondary workers are predominantly women. Almost 94% of all husbands in the sample were employed, as compared to only 58% of wives. Among those who were employed, 62% of husbands held formal jobs, 10% higher than the wives in the survey. Additionally, roughly 74% of all wives, and 73% of employed wives, earned less than their spouses.

best way to spend household income and they each have some power over the final decision, based on the preferences of each member and their bargaining power.

In this context, the share of household income contributed by each member has an important impact on how money is spent, and according to whose preferences. By assigning the monetary transfer to the female head of household, this social program may increase their bargaining power. Thus, we should expect an increase in her ability to make decisions regarding the use of money as one effect of the policy.

3.3 Union dissolution

The AFAM-PE may also yield behavioral responses regarding marital dissolution decisions. On the one hand, the program may lead to a change in the perceived gains of being married; for instance, the increase in a female head of household's non-labor income may make single parenthood more attractive relative to a marriage with children (e.g. Francesconi et al., 2009). Moreover, the cash transfer could improve her economic independence or induce conflicts with her partner over how to use of the monetary benefit, or meeting the program's conditions. Thus, marital dissolution could increase (e.g. Bobonis, 2009). On the other hand, the increase in total income of household could reduce conflicts related to the intra-household allocation of resources, and thus lead to a reduction in marital dissolution (e.g. Bobonis, 2011).

In sum, the net behavioral responses to the AFAM-PE program regarding labor market choices (with the exception of registered employment responses), spending decisions, and marital transitions, are ambiguous. Thus, their sign and size are an empirical question to be addressed in the empirical analysis.

4   Empirical approach

4.1   Data and sample construction

The analysis uses two data sources matched at the individual level by way of a unique national identity number ("*cédula de identidad*"): the AFAM-PE administrative records and a follow-up survey of household applicants. While the follow-up survey collects self-declared information on all of the outcomes discussed in the previous section for the post-application period, the administrative records provide individual and household information at the baseline.

Specifically, the AFAM-PE administrative records correspond to a detailed questionnaire on the socio-economic and demographic characteristics of all individuals in (eligible and ineligible) households that applied to the program for the period January 2008 to September 2010. The detailed application form was designed to produce a eligibility score, and thus includes a rich set of data regarding socioeconomic status of the households at the time of application. The baseline information includes: the national identity numbers of each individual in a household, demographic characteristics, education, labor market participation, and durable assets, among others. The records also include the date of application and, most importantly, the exact value of the household's eligibility score computed by the AFAM-PE program administrators.

The follow-up survey of (eligible and non-eligible) AFAM-PE applicants, called the "*Encuesta de Seguimiento de Condiciones de Vida*", was designed to evaluate the impact of the program.[21] In order to limit strategic responses, surveyed households were not informed of the exact purpose of the survey. The evaluation sample was designed in such a way as to exploit the exogenous variation in the acceptance

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[21] This survey was designed by researchers at the Instituto de Economía (IECON) of the UDELAR, in collaboration with MIDES and other researchers at the Institute of Statistics and in the Department of Sociology at UDELAR (Amarante & Vigorito, 2011).

of households to the AFAM-PE due to the eligibility rule. Concretely, the follow-up survey comes from a stratified random sample of AFAM-PE administrative records, representing households whose income score was close to the eligibility threshold – the optimal interval of the (standardized) predicted income score is $\left[-0.0426; 0.0727\right]$.[22] The original size of the sample was 3,565 households; 1,242 households with a score below the threshold (non-eligible) and 2,323 households with a score above the cut-off point (eligible). A comprehensive household questionnaire was used that included specific modules on household composition, education, living conditions, income, labor market participation, social perceptions and attitudes.

The follow-up survey was collected between September 2011 and February 2013. Overall, 40% (1,441) of the stratified random sample of 3,565 households were interviewed, with a slighter higher proportion of non-response among ineligible households (44%) relative to those eligible households (39%). Although the possibility of a high-level of non-response was considered in the sample design, the notable size of attrition in the follow-up was not anticipated. The main reasons for failure to interview targeted sample households were: the exact location of households were not found by the survey team, household members were not present (i.e., during the days the survey team was in the area) or households had relocated to an unknown location. Appendix Section A.2 explores the issue of the follow-up non-response, and suggests that two-parent households who were not interviewed are selected relative to those who responded to the survey along the observable characteristics, however, this selection is not (statistically) relevant for those eligible relative to those in the counterpart group. There is an observable non-systemic correlation between AFAM-PE eligibility and non-response to the survey that protects the empirical analysis from internal validity concerns (related to this issue); however, the drawback arises in regards to external validity. That is, the empirical findings cannot be generalized to the whole population of AFAM but only to those adults in (two-parent) households that were interviewed for the follow-up survey.

To construct the final database for analysis, the data from the follow-up survey was matched to AFAM-PE administrative records. The sample of analysis was restricted to two-parent applicant households belonging to the evaluation optimal interval of the predicted income score, with mothers and fathers aged 18 to 64 years old at the time of the follow-up survey. This results in a sample of 613 households with 605 women (55%) and 492 men (45%). The sample selection was constructed using the following criteria.[23] First, the analysis focuses on decisions made by male and female beneficiaries who enrolled in the program as parents but who did not benefit from the program as eligible children (i.e., they were not required to be enrolled in school). Thus, by excluding individuals under 18 years old we are able to minimize the extent to which these individuals are likely to have their health or educational outcomes modified as a result of the program. Second, the age restrictions are designed to limit the study to economically-active individuals and minimize the potential effects of the decision between work and either schooling or retirement.[24]

Table 1 presents summary statistics of characteristics of couples by gender and eligibility status. Panel A reports the statistics for all couples in eligible households to AFAM-PE program, while Panel B presents data for all the couples in ineligible households. For the sake of comparison, Table 1 presents the

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[22]The sampling frame consists of 161,573 households that had enrolled in the program as of September 2010. The sample used a stratified sampling method at the local level (52 locations).

[23]For performing the analysis of union dissolution in section 5.2, the sample of two-parent households is constructed by using information at the baseline instead of at the time the household were surveyed at the follow-up survey as the purpose of the analysis is to explore whether mothers in union at *t-1*, i.e. at baseline, dissolve this relationship at *t*, i.e. by the time of the follow-up survey. In this case, the sample of analysis is restricted to 436 women who were in a relationship at the time that they applied to the AFAM-PE program.

[24]Refining the sample to adults who are not students (90.8% of the analysis sample) does not alter the main results, thus for sample size issues they were included. Additional restrictions imply not considering individuals who claim to be retired or inactive pensioners, nor individuals for whom no information is available at the time of the baseline survey, largely new household members (9.2% of the original sample). Including these individuals in the empirical analysis does not significantly alter the main results.

statistics using information from both the follow-up survey and baseline records (the empirical analysis includes only individual and household characteristics at the baseline). As expected from the design of the follow-up sample, both groups are similar in their observable characteristics. The more noticeable difference is that male and female partners in eligible households are, on average, younger than those in ineligible households.

4.2 Regression discontinuity (RD) design

The empirical method in this work exploits a discontinuity in the AFAM-PE eligibility requirement that creates an opportunity to use a sharp RD design.[25] As shown in Figure 1, assignment to the program is a deterministic function of the assignment variable, the household predicted income score: only those applicant households whose score is above the cut-off point were eligible to participate in the AFAM-PE program and receive the monetary transfer - which was generally entitled to the female head of household in charge of the children. The basic RD model can be specified as follows:

$$Y_{hi} \quad = \quad \alpha + \beta ELEG_{hi} + F(Z_{hi}) + \epsilon_{hi} \tag{2}$$

where Y_i is the outcome variable of men / women in household h with the value of the standardized income score, Z_{hi}. The standardized income score is computed as $Z_{hi} = S_{hi}–U$, where S represents the predicted income score and U is the eligibility threshold.[26] The main outcomes of interest corresponds to labor market status, i.e., non-employment, registered employment, unregistered employment, and also to hours worked (conditioned on being employed). The empirical analysis also explores additional household outcomes, includings marriage and the decision-making process. $F(Z_{hi})$ is a smooth function of the assignment variable Z (the *forcing variable*), which captures the effect of the standardized poverty score on the outcome of interest, while $ELEG_i$ is an indicator variable that indicates whether the adults belong to a household whose score is above the threshold. This is defined as:

$$ELEG_{hi} \begin{cases} 1 & si \ Z_{hi} > 0 \\ 0 & si \ Z_{hi} \leq 0 \end{cases}$$

The aim is to estimate the effect β of the program (eligibility for AFAM-PE) on the outcome of interest. Identification is based on the key assumption that $F(.)$ is a continuous function, which means that program eligibility is the only source of discontinuity in the outcome variable around the cut-off point. Under this assumption, the potential discontinuity in the outcome variable around the threshold can be interpreted as the causal effect of the AFAM-PE. Section 5.4 presents evidence that supports this assumption. Therefore, the effect of the program, β, is obtained by estimating the discontinuity in the empirical regression function at the point where the forcing variable switches from 0 to 1 (i.e., the eligibility threshold).

In practice, the estimated effect of the program depends on how the function $F(.)$ is estimated. In this work, estimations are based on various parametric functions of Z_{hi}, to balance the trade-off between bias and precision. Regression specifications use different polynomial forms, including linear, quadratic and cubic, as well as linear and quadratic models with different slopes on either side of the eligibility

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[25]See Imbens & Lemieux (2008) and Lee & Lemieux (2010) for a detailed discussion of RD design.

[26]AFAM-PE administators made the exact values of the eligibility thresholds for the period covered for this research available to the authors.

threshold (separate regressions on both sides of the discontinuity). Standard errors are estimated by clusters on the income score. Additionally, the model can be extended by adding baseline covariates; for the sake of simplicity in interpretation, the econometric model is estimated by least squares (OLS) based on linear probability model (unless explicitly stated otherwise). Marginal effects from non linear models (either, Logit and Probit) were in general similar and thus not reported.

5 Empirical results

5.1 Labor market outcomes of women and men in couples

5.1.1 Graphical evidence

Graphical representation of the discontinuity is an integral part of RD design (Lee & Lemieux, 2010). Indeed, a lack of graphical evidence on the impact of the program would make it difficult to support a different result through the more detailed regression-based analysis that follows. This section presents a graphical depiction of how the relevant labor market outcomes vary around the eligibility cut-off point. This work considers labor market outcomes at the extensive margin of choice (i.e., non-employment, registered employment, unregistered employment), and at the intensive margin of choice (i.e. worked hours conditional on being employed). Non-employment is a dummy variable that takes the value of one for those individuals who are not employed (either unemployed or inactive), and zero for those who are employed. Registered employment is a dummy that takes the value of one for those individuals who are employed and make contributions to social security, and takes the value of zero if the person is employed but does not contribute to social security (i.e. works in the informal labor market), or the person is unemployed or inactive. Unregistered employment is a dummy that takes the value of one if the person is employed and does not contribute to the social security system, and takes the value of zero if the person is employed and makes contributions to the social security system or if the person is unemployed or inactive. The variable for worked hours measures the total weekly number of hours worked for the individual (Table 2 presents summary statistics of the outcomes by gender and eligibility status).

Figures 2 to 5 present graphs for labor outcomes as a function of the standardized poverty score for a sample population of women and men in two-parent households. In each figure, black circles represent raw labor market means in (approximately) 0.5 percentage point of the score bins, and the solid line represents the predicted values of a first order polynomial on the standardized poverty score, which divides observations above and below the eligibility threshold. Whereas the unrestricted means reflect the underlying noise in the data, the regression lines better capture the trends in the data and the magnitude of the discontinuity of the variable at the cut-off point.

Figure 2 suggests that the employment rate slightly falls on the discontinuity threshold for women (l.h.s graph), while the effect of AFAM-PE on men appears to be unimportant (r.h.s graph). The lower levels of employment rates for women compared to men is in line with evidence for Uruguay that women in couples in poor households have clear challenges attached to labor market activities. The pattern of low integration of mothers into the labor market in Uruguay is also observed for women in non-vulnerable households (of course, except for those highly educated mothers in high-income households). Focusing on registered employment, the figures reveal registered employment drops for both parents in eligible households at the cut-off point (Figure 3). Importantly, this drop is quite large for women relative to men. On the other hand, Figure 4 indicates a decline in unregistered employment for both women and men in eligible households, but again, this effect appears to be more important for mothers (l.h.s. graph). In particular, in the case of women, the sharp drop in registered employment at the eligibility cut-off (Figure 3) seems to be mostly associated with a "switching effect" between formal and informal

status rather than a labor force participation effect, since the non-visual evidence of any discontinuity in employment rate. Finally, for the number of hours worked (intensive margin of employment), plots do not reflect a clear discontinuity at the threshold for either men or women in eligible households (Figure 5).

5.1.2 Basic RD estimates

This section formally exploits the discontinuity in the income score derived from the AFAM-PE assignment rule to estimate the RD models presented in section 4.2. Table 3 reports the RD estimation of the coefficient of interest which captures the discontinuity at the eligibility threshold on the relevant labor market outcomes, previously illustrated in the Figures. The columns report estimates of the RD model calculated by OLS for women (columns (1) to (5)) and men (columns (6) to (10)), by using specifications with a different order of polynomials for $F(.)$: non-polynomials, first-order, quadratic, cubic and linear spline model (which is a more flexible functional form of $F(.)$, allowing different slopes on either side of the threshold). Although results are presented for men and women separately, the main specification estimates a single RD model by adding to Eq. 2 an indicator for gender and the interaction with the variable capturing the eligibility condition ($ELEG_{hi}$) in order to improve reasonable statistical power. Rows in Table 3 show RD estimations of labor market outcomes of interest for specification without including controls to the regressions (Panel A) and by adding variables to control for household socioeconomic status (Panel B).

Estimates in Panel A indicate a positive effect of AFAM-PE on non-employment among eligible women around the eligibility cut-off, ranging between 9.1 and 13.1 percentage points, although not robust across specifications. Row 2 in Panel A, presents the estimates for unregistered employment, which suggest that eligible women increased their probability of being in an informal job between 6.8 and 8.8 percentage points; however, neither of the five estimates are statistically significant.

Regarding registered employment, estimates suggest that program eligibility has a large impact on this outcome for mothers in couples. As shown in all columns of Panel A, coefficients on the eligibility indicator are always positive and significant, at least at the five-percent level. Across all models, the magnitude of the effect ranges between 17.6 and 21.3 percentage points of registered employment. By dividing the estimate expressed in percentage points by the employment rate of ineligible women at the cut-off point (51%), the fraction concerned by the disincentive effect at the discontinuity could be recuperated, i.e., between 38.6% and 44.9% of eligible women. Finally, row 4 analyzes the effect of AFAM-PE on the intensive margin of employment and finds a negative impact on eligible women's hours worked (conditional on their working) though this effect was not statistically significant at usual levels. Neither statistically significant nor robust effects on labor market outcomes were found for women's partners in eligible households. Finally, the estimates are largely insensitive to controls for individual characteristics (age, schooling, head of household) and household (period in which the household was surveyed by the follow up survey) covariates (Panel B). Henceforth, the RD regression models with the same covariates as Panel B are used as the baseline specification.[27]

In conclusion, while men in two-parent households seem not to respond to the AFAM-PE incentives in their labor market decisions, women show a significant response, by reducing their registered employment. A possible explanation for the small and insignificant program effects on the labor supply of men is that their leisure income elasticity is on average close to zero, as suggested by previous studies focused on similar populations (Bosch & Manacorda, 2012).[28] The absence of a robust effect of AFAM-PE on

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[27] Including covariates in the RD design reduces the residual variance and allows one to gain precision in estimates, which is particularly useful in a sample analysis (as in this paper) where the sample size is relatively small (see e.g. Frölich, 2007)

[28] An alternative explanation could be given using a simple tax model. Under this model, the increase in female bargaining

women's employment also suggests that the pure income effect of the transfer may be counterbalanced by other factors. For instance, the increase in a redistribution of power might allow women in couples to overcome traditional gender roles and increase their labor supply, as suggested by non-cooperative bargaining models. Finally, as suggested by previous studies, the increase in household expenditures related to children's school attendance (e.g. transport costs) or the reduction of household labor sources of income (e.g. child labor) for the purpose of fulfilling the conditionalities of AFAM-PE, might have counterbalanced the effects of the monetary transfers on the beneficiary's household disposable income, and hence, on the consumption of leisure (e.g. Alzúa et al., 2013). In regards to the pattern of household responses to registered employment decisions, the evidence is consistent with the prediction that the secondary worker – i.e. the woman-, is the member most likely to react to the financial incentives of the AFAM-PE program. This result is also in line with studies that focus on labor supply responses of cohabiting couples, which have found evidence that work disincentive effects of income transfer programs mainly affect the secondary worker in the couple (e.g. Eissa & Hoynes 2004).

5.1.3 Employment transitions

Since the AFAM-PE administrative records collect information on the labor market status of household members at baseline, it is possible to use a panel data setting to follow people over two-time periods - i.e., when they applied to AFAM-PE and then when the follow-up survey was collected. For labor outcomes, those that are considered at the baseline are the same as those considered in the follow-up survey data, i.e. non-employment, registered employment, and unregistered employment. This information allows us to examine whether the AFAM-PE led to changes in the rate at which individuals in couples entered and left the different labor market status, i.e., non-employment, unregistered employment, and registered employment. That is, the impact of the program on (two-time-points) employment transitions can be directly assessed, which is useful to explore for changes in labor market dynamics. To perform the transition analysis, the AFAM-PE effect is estimated on both the probability of staying in any of the three labor market status analyzed so far, and on the probability of entry to each one of those employment status from the two remaining. The former set of probabilities are labeled as persistence probabilities and the latter as entry probabilities.[29]

The estimated treatment effects are shown in Tables 4 and 5, for women and men, respectively. Columns in those tables report the point estimates for persistence (rows in Panel *(a)*) and entry probabilities (rows from Panel *(b)* to Panel *(d)*) from regression models that control by different polynomial forms for the running variable and the same covariates as Table 3.

For the sample of women in Table 4, we found that the AFAM-PE had no significant effect on persistence probabilities in non-employment (row 1 in Panel *(a)*), nor on entry probabilities into that status, for any of the RD models estimated (Panel *(b)*). However, as was expected from the predictions above, as well as the earlier reported empirical results, there is some sizable effect in transition probabilities on registered and unregistered employment status. Results in row 2, Panel (*a*), show that the program increased eligible women's persistence rate in unregistered employment, and that the magnitude of the effect ranges between 18.9 and 22.6 percentage points, being statistically significant across all estimations. Point estimates in Panel (*c*) reveals a sizable increase in the entry probability into informal employment

from registered employment, but this effect is not statistically significant, and there is no evidence (at usual statistical levels) of an increase in inflow to informal employment out of non-employment.

In turn, row 3 in Panel (a) shows that the persistence rate along the registered employment margin declines for eligible women for the AFAM-PE, and the magnitude of the impact is located in the range of -19.1 to -26.4 percentage points, although this effect is not statistically significant for any of the specifications considered. Indeed, entry rate to registered employment from unregistered employment for the same group of women shows a sizable reduction, in the range of -17.2 to -23 percentage points, although again, the reduction is not stable across specifications (row 3 in Panel (d)). For the sample of men, the results presented in Table 5 do not show evidence of any significant effect of the AFAM-PE program on labor market transitions, except for an increase in the persistence rate of non-employment, although this estimate is not robust across the RD regression model specifications.

In general, estimates of the AFAM-PE program's effect on employment transitions at the eligibility cut-off are consistent with both theoretical predictions and with those results found earlier for employment levels. Results do not show robust evidence that the AFAM-PE is associated with significant income effects caused by encouraging individuals out of employment. On the other hand, the negative effect on the registered employment of women seems to be associated with a decline in transitions into formality from unregistered jobs. The fact that persistence in unregistered employment increased suggests that lower transition rates to formal employment from informality could also be a plausible explanation for a decline in registered employment levels. This findings suggest that the AFAM-PE reduces beneficiaries' incentives to actively search for registered employment, which is consistent with the evidence found for other CCT programs in the context of medium-high informal labor markets (see e.g. Garganta & Gasparini, 2015).

5.1.4 Heterogeneous responses of labor market outcomes by partner's employment status

The AFAM-PE introduces differential incentives for different household configurations, in particular, according to an individual's partner's employment status. The work and formal employment disincentives of women (men) whose partners were employed should be stronger relative to those whose partners were not employed, since for the former, depending on the partner's (registered) earnings, the household could become ineligible for the benefit. This section aims to explore for such heterogeneity across individual labor market responses, depending on his/her partner's employment status. It should be stressed that the identification of these effects arises from the assumption that the labor market status of the individual's partner is exogenously given.[30]

Table 6 reports the RD estimations of the labor market outcomes of interest for different polynomial specifications of the running variable. Panel A and Panel B, present the estimates for the sample of women and men, respectively. The estimates of the relevant coefficients presented in both Panels in Table 6, distinguish between the women (men)'s partner's employment status, labeled "Partner works" and "Partner does not work".[31] For the sample of women, there is no conclusive evidence of sizable heterogeneity in the program's effects, depending on their partner's employment status. In particular, the AFAM-PE induces a statistically significant decline in registered employment among women (as was documented above), however, this effect is not statistically different whether or not her partner is employed. On the other hand, for the sample of men, the AFAM-PE program has virtually zero effect on labor market outcomes and this result occurs irrespective of their partners' labor status. The lack of variation in the employment responses of individuals by partners' labor market status contrasts with the

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[30] Additional estimates which consider the employment status of partners at baseline instead of their post-treatment status do not show different patterns of results as those discussed in this section.

[31] The specification of the RD model estimated extends the Eq. (2) by including additional indicators for whether or not the individual's partner was employed at baseline and interactions with the variable indicator for eligibility.

existing evidence on the labor supply responses to financial incentives for households in developed (e.g. Francesconi et al., 2009; Eissa & Hoynes, 2004) and developing (e.g. Bérgolo & Cruces, 2014) countries.

The AFAM-PE might have affected the behavior of individuals in couples in dimensions other than their labor market decisions. The following sections explore the impact of the program on adult decisions about whether to dissolve their marital relationship and regarding the decision-making process within the household.

5.2 Effects of the AFAM-PE on marital dissolution

As discussed in Section 3, the expected impact on marital dissolution in eligible households is ambiguous, and it depends if the utility gains from the AFAM-PE were or were not lower during the marriage as compared to after the marital dissolution. In order to empirically address this issue, Table 7 presents estimates from RD models of transitions into marital dissolution for the sample of women who were in a union during the pre-treatment period (Figure 6 depicts graphical evidence on the discontinuity). The outcome of interest, marital dissolution, indicates whether mothers in a union at baseline broke off this relationship by either entering into a different union, or not (Table 2 reports descriptive statistics of the outcome by eligibility status). Columns in this table report the impact's coefficients for different specifications of the RD model.

The first row in Table 7 shows estimates of the AFAM-PE's effect on union dissolution for the whole sample of women. Treatment effects are not statistically significant for any of the RD models estimated, and show no evidence of changes in marital dissolution rate as consequence of the program. Rows 2 and 3 explore for a possible heterogeneous effect by the employment status of the woman's partner. As for the whole sample of women, there is no evidence that the AFAM-PE affected the marital status of women differently according to the employment situation of their partners.

In sum, these results imply that, for women both in eligible households and in relationships, enrollment in the AFAM-PE program did not have a significant effect on union dissolution. This finding contrasts with the existent evidence from other CCT programs, including Mexico's PROGRESA which, although small in magnitude, induced a significant increase in marital dissolution among eligible couples (Bobonis, 2011). The results in this section also contrast with the findings for developed countries, like the United States and United Kingdom, which suggest that families react to the incentives of welfare programs by making decisions about their marriages (Groeneveld et al., 1980; Bitler et al., 2004; Francesconi et al., 2009).

5.3 Intra-household decision-making and perceptions

By giving the monetary transfer directly to the female head of household, the AFAM-PE might improve her bargaining power, and hence could enhance her role in decision-making processes within the household. Unfortunately, in the current setting and with the available data it is difficult to directly test this hypothesis. However, the follow-up questionnaire contains a unique feature that allows one to check whether the AFAM-PE has had some direct effect on the process of decision-making, at least as perceived by the women answering the questionnaire. In particular, by using collected information on who makes the decisions within the household relative to some consumption decisions, this section explores whether receipt of a cash transfer is associated with an increase in women's declared decision-making power. If the AFAM-PE represents an improvement in the bargaining position of eligible women, we would expect to see an increase in their ability to take part in the (perceived) decision-making process within their households, and in particular, regarding the usage of money.[32] The specific decision-making questions

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[32]Self-declared information from surveys has been commonly used in previous studies to analyze the household decision-making process. See for instance, Attanasio & Lechene (2002); Morozumi (2012).

used for this proposal are: "Who decides how much to spend on food at home?" ("*¿Quién decide cuánto se gasta en comida en el hogar?*") and, "If anyone in the household receives additional money for any work, gift, or new cash-transfer from the state: who decides how to spend it? ("*Si alguien del hogar recibe dinero adicional por algún trabajo, regalo o nueva transferencia del Estado: ¿quién decide cómo gastarlo?*"). The survey asks the benefit recipient (i.e., the female head in applicant households) about who is responsible for making decisions. Respondents can attribute decision-making to any combination of the following people: the respondent herself, her partner, both heads of household, other members of the household, or the respondent must consult with all of the members of the household.[33] Based on these two decision-making questions and their possible responses, two outcome variables are constructed:

(1) Refers to who decides on food expenses in the household, and it is coded as 1, 2, or 3, if "Others or your husband decide," "You decide," or "Both decide," respectively.

(2) Refers to who decides on additional money in household, and it is coded as 1, 2, 3, or 4, if "Others or your husband decide," "Depends on who receives it," "You decide," or "Both decide," respectively.

Table 2 reports the sample's descriptive statistics for women's perceptions about who is responsible for making decisions regarding those aspects, between eligible and ineligible households. In relation to the question about who decides on food expenses, it can be seen that while in eligible households, 37% of the women respond that they themselves decide, in ineligible households, 28% of the women answered that they decide. As for the question about who makes decisions regarding additional money in a household, 10% of women in ineligible households believe that they are solely responsible, while for eligible household this number increases to 14%. However, most of women in either eligible and ineligible households state that decisions are made together with their partner.

The estimation strategy used to examine the impact of AFAM-PE eligibility on involvement in the decision-making process for the sample of women relies on a multinomial logit framework. The multinomial logit model allows us to jointly estimate the probabilities of women's perception about who holds the decision-making power in the management of the money within household, as a result of being eligible to the AFAM-PE. The following model is estimated:

$$whodecides_{hi} \quad = \quad \alpha + \beta ELEG_{hi} + F(Z_{hi}) + X´\delta + \epsilon_{hi} \qquad (3)$$

where *whodecides* is coded as explained above, according to which both decision-making questions are used for the empirical analysis. The function $F(Z_{hi})$ and the indicator for eligibility $ELEG_{hi}$ are defined as in Equation 3 above, while the vector X includes the individual and household covariates at baseline used in the earlier estimates. Marginal effects from the RD multinomial logit estimation are reported in Tables 8 and 9.

Table 8 examines the effect of AFAM-PE on the decision-making process regarding food expenses. In row 1, the coefficient for "others or your husband decide" is statistically insignificant, though the marginal effect is negative for almost all specifications. Recipient women are statistically significantly more likely to decide about food expenses after their household became eligible for AFAM-PE (row 2). This effect is robust across specifications and large; according to the responses, there is an increase in the range of 12.5 to 18.9 percentage points in the probability that eligible women make decisions regarding food expenses relative to those in ineligible households around cut-off point. Finally, there is a decline in

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[33]For the question about who decides how much to spend on food at home, the possible answers given to the respondent are: 1) you decide, 2) your partner, 3) both decide, 4) another woman in the home, 5) another man in the home, 6) you have to consult with all members of the household, 9) do not know. For the question about who decides how to spend additional money received for any work, gift or new cash-transfer from the state, the possible answers given are: 1) it depends on who receives it, 2) you decide, 3) you have to give it to your partner, 4) both decide, 5) you have to consult with all members of the household.

the probability that the female head of household and her partner jointly decide on food expenses after the AFAM-PE, although this effect is not robust across specifications.

Table 9 presents estimates regarding who decides on how to spend any additional money. Results do not show any significant effect of the program on this type of decision, with the exception of those who responded that the female head (respondent) make the decision on her own (row 3). The marginal effects are always positive, meaning that it is more likely that women make decisions about the management of the additional money in the household, however the size of this effect is small and not always statistically significant for the different regressions estimated.

Taken together, these results provide suggestive evidence that the AFAM-PE increases the probability that women in eligible households make (according to their perceptions) decisions by themselves, at least regarding the issues asked about in the follow-up survey. This fact seems to be explained by a decrease in both the probability that other adults make these decisions and in the decisions made jointly by the couple. These findings are consistent with the suggestion that the program, by giving the income directly to the female head of household, improves her position in the decision-making process within the household.

5.4   Robustness Analysis

The main identification assumption for validity of the RD estimates in this paper, is that $F(.)$ in Equation 2 is a continuous function at the eligibility threshold. This assumption could be violated in at least two ways: first, if program enrollment had favored only households with adults who were unemployed or unregistered employed, and, second, if applicants lied about the socioeconomic characteristics when filling out the application form, perhaps as part of some form of strategic behavior. If this type of "manipulation" were possible in a perfect way, applicants with a predicted income score higher and lower than the eligibility cut-off would have systematically different observable and unobservable characteristics, potentially biasing the estimates.

As has been pointed out, the households were not informed about how the application form would be used, nor were they told what exact criteria would be used for program enrollment–the method by which the income score was constructed. In addition, specific details about the eligibility rule have never been published, making it improbable that applicants were aware of how to manipulate answers, at least in any exacting manner. Moreover, the Figure 1 shows that approximately all of the eligible households (according to the income score) have become participants while almost no household that is ineligible has received the benefit. This suggests that it is highly unlikely that some households have been favored, for example, by the MIDES or the SSA representatives who have been implementing and operating the program.

To formally explore this possibility, a RD linear spline polynomial model is estimated for a set of individual/household characteristics at the baseline (age, gender, education, region, head of household, number of household members, average age of household). For there to be some type of systematic manipulation, one should observe a discontinuity in those pre-treatment variables around the eligibility threshold (Lee & Lemieux, 2010; McCrary, 2008).

Figure 8 depicts the RD estimates for a set of pre-treatment covariates. This figure indicates that none of the estimated discontinuities are statistically different from zero, except those variables capturing schooling for men (Panel b) and the average of schooling for the household's members (Panel c).

An additional and more direct test for the assumption of continuity is to examine the density of the forcing variable at the eligibility threshold. If there were manipulation of the eligibility rule, for example, if some ineligible households were erroneously computed with a higher income score, one would expect an excess of bunching of households just above the eligibility threshold. Figure 9 presents the

proportion of households with different standardized income score levels in the neighborhood of the threshold. Following the test proposed by McCrary (2008), the graph includes the estimation of local linear kernel regressions of the (logarithm) predicted income score density separately on both sides of the AFAM-PE eligibility cut-off point. As can be seen in the graph, the log-difference between the frequency of the right and left of the threshold is not statistically significant different from zero.[34] In sum, taken together, the results of this section allows us to be confident of the validity of the RD design used in this study.

6   Conclusions

Considering two-parent households with children, this study exploits the fact that the assignment mechanism to the AFAM-PE program in Uruguay exogenously alters the distribution of non-labor income across applicant households by targeting the monetary transfer (usually) to the female head of household in order to investigate intra-household behavioral responses. We examine labor market outcomes, such as participation and formality decisions, and other social domains, including the decision-making process within households, and union dissolution.

Based on a RD design and a follow-up survey matched using program administrative records, this study stresses four relevant empirical results. First, the financial incentives of the program have effects on the labor market behavior of women in eligible two-parent households, mainly, with regards to the formality margin of choice. Second, the negative effect on women's labor formality is associated with a lower probability of remaining in registered employment and a lower rate of moving from informal to formal employment. However, women's responses do not appear to be heterogeneous in relation to their male partner's labor supply–as some theoretical models predict. Third, while the gender-based-targeting of the transfer may have an effect on marriage decisions, we have found no effect on partnership dissolution. This evidence contrasts strongly with the findings for various welfare programs in developed countries, like the United States and United Kingdom, and in some developing countries, like Mexico. Fourth, these results provide suggestive evidence that the AFAM-PE increases the likelihood that women in eligible households perceive themselves to be making independent decisions.

With regards to policy, these results have important implications for the design of social assistance in developing countries. The result that the AFAM-PE generates strong disincentives to registered employment is very important, and complements a growing literature indicating the negative effect of CCT programs on this margin of labor market (Bosch & Manacorda, 2012). Even more important is the finding that this unintended effect is primarily found among recipient women. Notably, this program operates in a context in which most of the women beneficiaries are characterized by having weak labor trajectories, unfavorable conditions to participate in the labor market and low availability of jobs with access to insurance. This is due to the low levels of human capital and the high cost to enter the labor market, exacerbated by the challenges of reconciling work and family life. Thus, while this evidence does not support an abandonment of the expansion of non-contributory social protection system in Latin America, as a way to address poverty and the lack of insurance among society's most vulnerable, it does suggest the need to discuss new designs that might reduce the discouraging effects of such policies (see e.g. Cruces & Bérgolo, 2013; Levy, 2008).

This study offers suggestive considerations for the ongoing debate about the impacts of these programs on gender equality and women's agency in developing countries. In this study, we find that while the program does not lead to major changes in the status of women or in how women are viewed by their social environment, the fact that the female head of household is the entitled beneficiary of the monetary

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[34]The point estimate (standard error) for the test is -0.157 (0.155). The optimal bandwidth of the intervals is calculated following McCrary (2008)

transfer has immediate consequences on her role in decision-making at home. There is suggestive evidence that the AFAM-PE cash transfer results in its female recipients taking greater responsibility for decision in specific spheres, including household expenditures. This conclusion reinforces arguments behind the policy's design, which propose that the transfers increase the overall resource control of female recipients within the household, and thus, the policy serves as an efficient instruments to increase women's decision-making and autonomy. In this sense, CCT programs play an important role by increasing the material basis that permits beneficiaries to choose between different possible options. However, transferring cash to women does not necessary imply an increase in their control over household resources. If this gender-based targeting reduces labor supply or discourages women from taking formal jobs (as in the AFAM-PE case), women may earn less labor income and reduce the amount of resources in their control. Moreover, a group of studies suggests that if women gain access to social assistance only as mothers, the policy appeals to the idea that care is considered primarily their responsibility (and not the responsibility of fathers), this is particularly true if cash transfers are conditional on fulfillment of conditionalities that require time; CCTs could thus reinforce the reproductive role of woman, perpetuating gender stereotypes and the social organization of work (Rodríguez Enríquez, 2011).

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Tables

Table 1: Summary statistics for coupled men and women by eligibility status

| | Panel A. Elegible Household | | | | Panel B. Inelegible Household | | | |
| | Men | | Women | | Men | | Women | |
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
(a) Sample								
N (Total=1097)	370		438		122		167	
Share	33.7		39.9		11.1		15.2	
(b) Baseline								
Age (years)	37.9	8.6	33.8	8.2	39.0	7.4	35.6	7.5
Schooling (years)	6.9	2.9	8.2	2.9	7.1	3.2	8.4	3.1
Montevideo	0.3	0.4	0.3	0.4	0.3	0.5	0.3	0.5
N^o houehold memebers	3.7	1.2	3.6	0.9	3.7	0.8	3.3	1.0
Avg. age in household (years)	40.0	10.5	35.8	8.1	39.3	6.7	36.9	7.3
Avg. schooling in household	7.3	2.1	7.6	2.3	7.6	2.9	8.0	2.6
(c) Follow-up survey								
Age (years)	38.5	8.4	34.6	8.1	40.2	7.5	37.1	7.6
Schooling (years)	8.3	2.5	9.1	2.5	9.0	2.6	9.6	2.5
Montevideo	0.3	0.4	0.3	0.4	0.3	0.5	0.3	0.5
N^o houehold memebers	3.8	1.0	3.7	0.8	3.8	0.8	3.7	0.8
N^o Children 0-5 years old	0.4	0.7	0.6	0.6	0.4	0.6	0.4	0.6
Avg. age in household (years)	38.8	7.2	37.2	6.9	40.6	6.3	38.9	6.8
Avg. schooling in household	8.6	1.9	8.8	1.9	9.2	2.1	9.2	2.1

Notes: The sample includes men and women between 18 and 64 years of age in two-parent households with children under 18 years old. The dataset corresponds to the AFAM-PE baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). "Eligible households" ("Ineligible households") refers to individuals in applicants households with predicted income score above (below) the eligibility threshold. "SD" refers to the standard deviation while "N" refers to the number of observations.

Table 2: Descriptive statistics of outcomes of analysis for coupled men and women by eligibility status

	Panel A. Elegible Household		Panel B. Inelegible Household	
	Men	Women	Men	Women
(1) Labor market outcome				
Non-employment rate	0.1	0.4	0.0	0.3
Registered employment rate	0.6	0.3	0.7	0.5
Unregistered employment rate	0.4	0.3	0.3	0.2
Worked hours (h>0)	45.8	30.0	43.8	35.7
(2) Union dissolution				
Marital dissolution / new couple formation		0.1		0.1
(3) Decision making perceptions				
(a) Food expenses				
Others or your husband decides		0.1		0.1
You decide		0.4		0.3
Both decide		0.5		0.6
(b) Additional money at household				
Others or your husband decides		0.1		0.1
It depends on who receives it		0.2		0.2
You decide		0.1		0.1
Both decide		0.6		0.6

Notes: The sample includes men and women between 18 and 64 years of age in two-parent households with children under 18 years old. The dataset corresponds to the AFAM-PE baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). "Eligible households" ("Ineligible households") refers to individuals in applicants households with predicted income score above (below) the eligibility threshold. "SD" refers to the standard deviation while "N" refers to the number of observations.

Table 3: RD estimates of the effect of AFAM-PE on couples' labor market outcomes

Panel A: Without controls

Outcome	Mean of ineligibles	(1)	(2)	(3)	(4)	(5)	Mean of ineligibles	(6)	(7)	(8)	(9)	(10)	N
				Women						Men			
Non-employment	0.28	0.121** [0.049]	0.131** [0.061]	0.091 [0.068]	0.116 [0.073]	0.099 [0.066]	0.05	0.008 [0.028]	0.018 [0.046]	-0.021 [0.053]	0.003 [0.058]	-0.013 [0.052]	1,097
Unregistered employment	0.20	0.070 [0.051]	0.081 [0.071]	0.085 [0.082]	0.068 [0.088]	0.088 [0.078]	0.30	0.048 [0.058]	0.060 [0.076]	0.063 [0.085]	0.047 [0.091]	0.066 [0.082]	1,097
Registered employment	0.51	-0.191*** [0.057]	-0.213*** [0.072]	-0.176** [0.083]	-0.185** [0.087]	-0.186** [0.081]	0.66	-0.056 [0.061]	-0.078 [0.075]	-0.042 [0.085]	-0.050 [0.089]	-0.052 [0.083]	1,097
Worked hours (h>0)	35.68	-3.625 [2.552]	-1.102 [3.359]	-3.612 [3.612]	-4.380 [4.005]	-2.404 [3.471]	43.79	3.570 [2.213]	6.034* [3.146]	3.665 [3.292]	2.924 [3.674]	4.816 [3.167]	792
Polynomial terms in running variable		No	Linear	Quadratic	Cubic	Linear spline		No	Linear	Quadratic	Cubic	Linear spline	

Panel B: With controls

Outcome	Mean of ineligibles	(1)	(2)	(3)	(4)	(5)	Mean of ineligibles	(6)	(7)	(8)	(9)	(10)	N
				Women						Men			
Non-employment	0.28	0.116** [0.049]	0.128** [0.062]	0.091 [0.070]	0.122 [0.075]	0.094 [0.068]	0.05	0.006 [0.028]	0.018 [0.047]	-0.019 [0.055]	0.011 [0.060]	-0.015 [0.053]	1,094
Unregistered employment	0.20	0.095* [0.051]	0.090 [0.071]	0.093 [0.079]	0.085 [0.085]	0.094 [0.076]	0.30	0.066 [0.057]	0.061 [0.075]	0.064 [0.082]	0.057 [0.088]	0.065 [0.080]	1,094
Registered employment	0.51	-0.211*** [0.057]	-0.218*** [0.073]	-0.184** [0.084]	-0.208** [0.087]	-0.188** [0.082]	0.66	-0.072 [0.060]	-0.079 [0.073]	-0.045 [0.083]	-0.068 [0.086]	-0.050 [0.081]	1,094
Worked hours (h>0)	35.68	-3.342 [2.578]	-1.054 [3.344]	-3.645 [3.583]	-4.263 [3.953]	-2.525 [3.450]	43.79	3.662 [2.222]	5.905* [3.162]	3.441 [3.351]	2.857 [3.700]	4.506 [3.213]	792
Polynomial terms in running variable		No	Linear	Quadratic	Cubic	Linear spline		No	Linear	Quadratic	Cubic	Linear spline	

Notes: The table shows the estimated effect of being eligible for the AFAM-PE on the results of the labor market. The eligibility indicator equals one if the predicted income score of the households is above the eligibility threshold. The sample includes men and women between 18 and 64 years of age in two-parent households with children under 18 years old. The dataset corresponds to the AFAM baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). The regressions are estimated for a linear probability model. Columns 1 to 5 and 6 to 10 in Panel A include polynomials of grade 0, 1, 2, 3, and a linear spline of the standardized predicted income score. Panel B also includes pre-treatment controls: age, (5 categories) education, (4 categories), head of household, household size (3 categories), region of residence (Montevideo), average age of household members over 18 years old, average years of education of household members above 18 years old , and indicators for the month the household was surveyed (this variable is included in all regressions). The difference in the number of observations in Panel A. and Panel B. is explained by missing information in some of the regression´s covariates (education, age). The standard errors (in brackets) correspond to clusters by income score. The median of the dependent variables correspond to the group of women/men in ineligible households . *significant to 10%; **significant to 5%; ***significant to 1%.

Table 4: RD estimates of the effect of AFAM-PE on women's labor market outcomes by pre-treatment employment status

Outcome	Coefficient [Standard error]					N
	(1)	(2)	(3)	(4)	(5)	
(a) Persistence probability						
Non-employment	0.077	0.079	0.044	0.094	0.045	601
	[0.073]	[0.095]	[0.110]	[0.117]	[0.105]	
Unregistered employment	0.189**	0.194**	0.222**	0.226*	0.216**	601
	[0.078]	[0.098]	[0.112]	[0.119]	[0.106]	
Registered employment	-0.197	-0.204	-0.196	-0.264	-0.191	601
	[0.135]	[0.145]	[0.154]	[0.162]	[0.151]	
(b) Entry probability to non-employment from						
Unregistered employment	-0.012	-0.010	-0.045	0.005	-0.044	601
	[0.075]	[0.096]	[0.110]	[0.116]	[0.107]	
Registered employment	0.025	0.027	-0.011	0.053	-0.010	601
	[0.102]	[0.119]	[0.131]	[0.140]	[0.127]	
(c) Entry probability to unregistred employment from						
Non-employment	0.034	0.039	0.067	0.070	0.061	601
	[0.067]	[0.092]	[0.104]	[0.111]	[0.100]	
Registered employment	0.172	0.177	0.207	0.211	0.201	601
	[0.108]	[0.125]	[0.131]	[0.143]	[0.127]	
(d) Entry probability to registred employment from						
Non-employment	-0.111	-0.118	-0.111	-0.164	-0.106	601
	[0.074]	[0.092]	[0.111]	[0.116]	[0.108]	
Unregistered employment	-0.177**	-0.185*	-0.178	-0.230*	-0.172	601
	[0.089]	[0.105]	[0.121]	[0.125]	[0.118]	
Polynomial terms in running variable	No	Linear	Quadratic	Cubic	Linear spline	

Notes: The table reports the estimation of the effect of being eligible for the AFAM-PE on the results of the labor market for women in t conditional on their pre-treatment labor status. The specification extends the Eq. (2) by including additional indicators for the possible labor market status at baseline and interactions with the variable indicator for eligibility. The eligibility indicator equals one if the predicted income score of the households is above the eligibility threshold. To perform the transition analysis, the AFAM-PE effect is estimated on both the probability of staying in any of the three labor market status of interest and on the probability of entry to each one of those employment statuses from the remaining two. The former set of probabilities are labeled as persistence probabilities and the latter as entry probabilities. The sample includes men and women between 18 and 64 years of age in two-parent households with children under 18 years old. The dataset corresponds to the AFAM baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). The regressions are estimated for a linear probability model. RD regressions in columns 1 to 5 include polynomials of grade 0, 1, 2, 3 and a linear spline of the standardized predicted income score, respectively, including pre-treatment covariates: age, (5 categories) education, (4 categories), head of household, household´s size (3 categories), region of residence (Montevideo), average age of household members above 18 years old, average years of education of household members above 18 years old , and indicators for the month the household was surveyed (this variable is included in all regressions). The difference in the number of observations in this Table (601) and the total number of women in the sample (605) is explained by missing information in some of the regression's covariates (education, age). The standard errors (in brackets) correspond to clusters by income score. *significant to 10%; **significant to 5%; ***significant to 1%.

Table 5: RD estimates of the effect of AFAM-PE on men/s labor market outcomes by pre-treatment employment status

Outcome	Coefficient [Standard error]					N
	(1)	(2)	(3)	(4)	(5)	
(a) Persistence probability						
Non-employment	0.103**	0.125**	0.071	0.067	0.088*	490
	[0.041]	[0.052]	[0.052]	[0.058]	[0.051]	
Unregistered employment	0.150*	0.122	0.112	0.092	0.118	490
	[0.077]	[0.100]	[0.116]	[0.121]	[0.112]	
Registered employment	0.043	0.048	0.110	0.140	0.089	490
	[0.113]	[0.125]	[0.135]	[0.138]	[0.133]	
(b) Entry probability to non-employment from						
Unregistered employment	0.022	0.045	-0.018	-0.021	0.001	490
	[0.025]	[0.036]	[0.045]	[0.047]	[0.045]	
Registered employment	-0.005	0.018	-0.036	-0.039	-0.020	490
	[0.057]	[0.058]	[0.061]	[0.063]	[0.060]	
(c) Entry probability to unregistred employment from						
Non-employment	0.098	0.071	0.063	0.039	0.068	490
	[0.132]	[0.146]	[0.156]	[0.160]	[0.154]	
Registered employment	-0.038	-0.066	-0.075	-0.101	-0.069	490
	[0.099]	[0.114]	[0.120]	[0.127]	[0.117]	
(d) Entry probability to registred employment from						
Non-employment	-0.201	-0.196	-0.133	-0.106	-0.156	490
	[0.132]	[0.144]	[0.156]	[0.157]	[0.154]	
Unregistered employment	-0.172**	-0.167*	-0.094	-0.071	-0.119	490
	[0.079]	[0.100]	[0.120]	[0.123]	[0.117]	
Polynomial terms in running variable	No	Linear	Quadratic	Cubic	Linear spline	

Notes: The table reports the estimation of the effect of being eligible for the AFAM-PE on the results of the labor market for men in t conditional on their pre-treatment labor status. The dataset corresponds to the AFAM baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). The variables included in each regression are listed in the note to Table 4 but they pertain, where it corresponds, to the husband. See note to Table 4 for a description of the exact way in which the RD model for employment transitions are estimated. The difference in the number of observations in this Table (491) and the total number of men in the sample (490) is explained by missing information in some of the regression's covariates (education, age). The standard errors (in brackets) correspond to clusters by income score. *significant to 10%; **significant to 5% ***significant to 1%. *significant to 10%; **significant to 5%; ***significant to 1%.

Table 6: RD estimates of the effect of AFAM-PE on couples's labor market outcomes by partner's employment status

Outcome	Coefficient [Standard error]					N
	(1)	(2)	(3)	(4)	(5)	

Panel A. Women

(a) Partner works

	(1)	(2)	(3)	(4)	(5)	N
Non-employment	0.076	0.075	0.040	0.099	0.036	601
	[0.061]	[0.090]	[0.106]	[0.115]	[0.101]	
Unregistered employment	0.090	0.093	0.121	0.125	0.113	601
	[0.059]	[0.086]	[0.101]	[0.108]	[0.095]	
Registered employment	-0.166**	-0.168*	-0.161	-0.224*	-0.149	601
	[0.069]	[0.092]	[0.114]	[0.117]	[0.110]	

(b) Partner does not works

	(1)	(2)	(3)	(4)	(5)	N
Non-employment	0.176	0.175	0.144	0.213	0.142	601
	[0.173]	[0.183]	[0.190]	[0.197]	[0.188]	
Unregistered employment	0.185	0.188	0.212	0.216	0.204	601
	[0.130]	[0.143]	[0.150]	[0.157]	[0.146]	
Registered employment	-0.360*	-0.362*	-0.356*	-0.429**	-0.347*	601
	[0.188]	[0.195]	[0.202]	[0.208]	[0.200]	

Panel B. Men

(a) Partner works

	(1)	(2)	(3)	(4)	(5)	N
Non-employment	0.038	0.063	0.004	0.000	0.021	491
	[0.029]	[0.039]	[0.045]	[0.048]	[0.044]	
Unregistered employment	0.122	0.106	0.083	0.067	0.090	491
	[0.077]	[0.104]	[0.120]	[0.126]	[0.116]	
Registered employment	-0.160**	-0.169	-0.087	-0.068	-0.111	491
	[0.081]	[0.106]	[0.126]	[0.130]	[0.122]	

(b) Partner does not works

	(1)	(2)	(3)	(4)	(5)	N
Non-employment	0.010	0.034	-0.014	-0.018	0.002	491
	[0.033]	[0.043]	[0.047]	[0.052]	[0.047]	
Unregistered employment	0.007	-0.009	-0.027	-0.045	-0.020	491
	[0.101]	[0.121]	[0.133]	[0.139]	[0.129]	
Registered employment	-0.017	-0.025	0.040	0.063	0.018	491
	[0.103]	[0.123]	[0.137]	[0.142]	[0.133]	
Polynomial terms in running variable	No	Linear	Quadratic	Cubic	Linear spline	

Notes: The table reports the estimation of the effect of being eligible for the AFAM-PE on the results of the labor market from men and women conditional on the pre-treatment labor status of the partner. The eligibility indicator equals one if the predicted income score of the household is above the eligibility threshold. The specification of the RD model estimated extends the Eq. (2) by including additional indicators on whether or not the fact that individual's partner was employed at baseline and interactions with the variable indicator for eligibility. The sample includes men and women between 18 and 64 years of age in two-parent households with children under 18 years old. The dataset corresponds to the AFAM baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). The regressions are estimated for a linear probability model. RD regressions in columns 1 to 5 include polynomials of grade 0, 1, 2, 3, and a linear spline of the standardized predicted income score, respectively, including pre-treatment covariates: age, (5 categories) education, (4 categories), head of household, household´s size (3 categories), region of residence (Montevideo), average age of household members above 18 years old, average years of education of household members above 18 years old , and indicators for the month the household was surveyed (this variable is included in all regressions). The difference in the number of observations in this Table (601/490) and the total number of women/men in the sample (605/491) is explained by missing information in some of the regression´s covariates (education, age). The standard errors (in brackets) correspond to clusters by income score. *significant to 10%; **significant to 5%; ***significant to 1%.

Table 7: RD estimates of the effect of AFAM-PE on union dissolution, overall and by partner's pre-treatment employment status

Sample of analysis	Coefficient [Standard error]					N
	(1)	(2)	(3)	(4)	(5)	
All households	0.010 [0.033]	0.036 [0.060]	0.015 [0.063]	0.089 [0.077]	0.012 [0.060]	436
Partner was employed	0.012 [0.034]	0.042 [0.062]	0.024 [0.062]	0.097 [0.075]	0.020 [0.060]	436
Partner was not employed	-0.005 [0.067]	0.023 [0.079]	0.008 [0.083]	0.078 [0.094]	0.005 [0.080]	436
Polynomial terms in running variable	No	Linear	Quadratic	Cubic	Linear spline	

Notes: The table shows the estimated effect of being eligible for the AFAM-PE on union dissolution. The eligibility indicator equals one if the predicted income score of the household is above the eligibility threshold. The sample includes women between 18 and 64 years of age in two-parent households with children under 18 years old. For performing the analysis of union dissolution, the sample of two-parents households is constructed by using information at the baseline instead of at the time the household were surveyed at the follow-up survey as in the rest of the empirical analysis. Thereby, the sample of analysis in this Table is restricted to 436 women who were in couple at the time the household postulated to the AFAM-PE program. The dataset corresponds to the AFAM baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). The regressions are estimated for a linear probability model. RD regressions in columns 1 to 5 include polynomials of grade 0, 1, 2, 3 and a linear spline of the standardized predicted income score, respectively, including pre-treatment covariates: age, (5 categories) education, (4 categories), head of household, household's size (3 categories), region of residence (Montevideo), average age of household members above 18 years old, average years of education of household members above 18 years old , and indicators for the month the household was surveyed (this variable is included in all regressions). The difference in the number of observations in this Table (601/490) and the total number of women/men in the sample (605/491) is explained by missing information in some of the regression's covariates (education, age). The standard errors (in brackets) correspond to clusters by income score. *significant to 10%; **significant to 5%; ***significant to 1%.

Table 8: RD estimates of the effect of AFAM-PE on women's decision-making measure: women reporting decisions regarding food expenses

Dependent Variable: who decide on food expenses	Mean of ineligibles	Coefficient [Standard error]					N
		(1)	(2)	(3)	(4)	(5)	
Others or your husband decide	0.08	-0.020 [0.022]	-0.025 [0.035]	-0.017 [0.034]	-0.016 [0.037]	-0.013 [0.031]	680
You decide	0.28	0.125** [0.057]	0.187*** [0.068]	0.165* [0.086]	0.153* [0.091]	0.189** [0.079]	680
Both decide	0.63	-0.105* [0.060]	-0.161** [0.075]	-0.148 [0.092]	-0.137 [0.097]	-0.176** [0.085]	680
Polynomial terms in running variable		No	Linear	Quadratic	Cubic	Linear spline	

Notes: The table shows the marginal estimated effects of being eligible for the AFAM-PE on who makes decisions regarding food expenses in the household. The eligibility indicator equals one if the predicted income score of the households is above the eligibility threshold. The sample includes women between 18 and 64 years of age in two-parent households with children under 18 years old. The dataset corresponds to the AFAM baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). The regressions are estimated for a multinomial logit model which allows one to jointly estimate the probabilities of the women's perception about who decides on food expenses. The RD multinomial logit regressions in columns 1 to 5 include polynomials of grade 0, 1, 2, 3 and a linear spline of the standardized predicted income score, respectively, including pre-treatment covariates: age, (5 categories) education, (4 categories), head of household, household´s size (3 categories), region of residence (Montevideo), average age of household members over 18, average years of education of household members over 18 , and indicators for the month the household was surveyed (this variable is included in all regressions). The standard errors (in brackets) correspond to clusters by income score. *significant to 10%; **significant to 5%; ***significant to 1%.
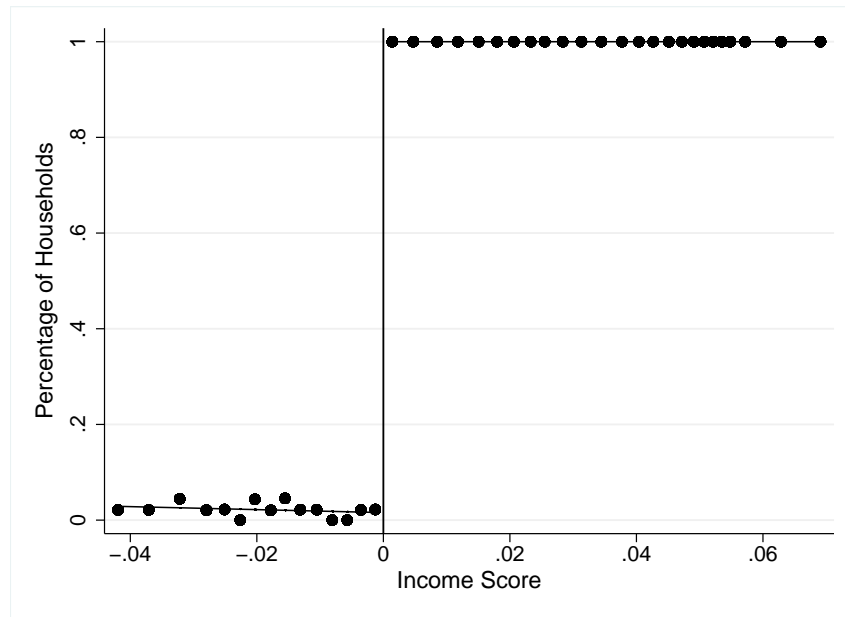
Table 9: RD estimates of the effect of AFAM-PE on women's decision-making measures: women reporting on decisions regarding additional money

Dependent Variable: who decide on additional money	Mean of ineligibles	Coefficient [Standard error]					N
		(1)	(2)	(3)	(4)	(5)	
Others or your husband decide	0.06	-0.003 [0.026]	-0.004 [0.039]	0.004 [0.048]	-0.006 [0.057]	0.005 [0.046]	675
Depends on who receives it	0.19	-0.048 [0.031]	-0.013 [0.036]	-0.000 [0.040]	-0.026 [0.052]	0.010 [0.037]	675
You decide	0.1	0.065* [0.036]	0.103*** [0.038]	0.045 [0.055]	0.047 [0.055]	0.059 [0.050]	675
Both decide	0.65	-0.014 [0.052]	-0.086 [0.067]	-0.049 [0.085]	-0.016 [0.095]	-0.073 [0.078]	675
Polynomial terms in running variable		No	Linear	Quadratic	Cubic	Linear spline	

Notes: The table shows the marginal estimated effects of being eligible for the AFAM-PE on who makes decisions about additional money in the household. See notes to Table 8. The standard errors (in brackets) correspond to clusters by income score. *significant to 10%; **significant to 5%; ***significant to 1%.
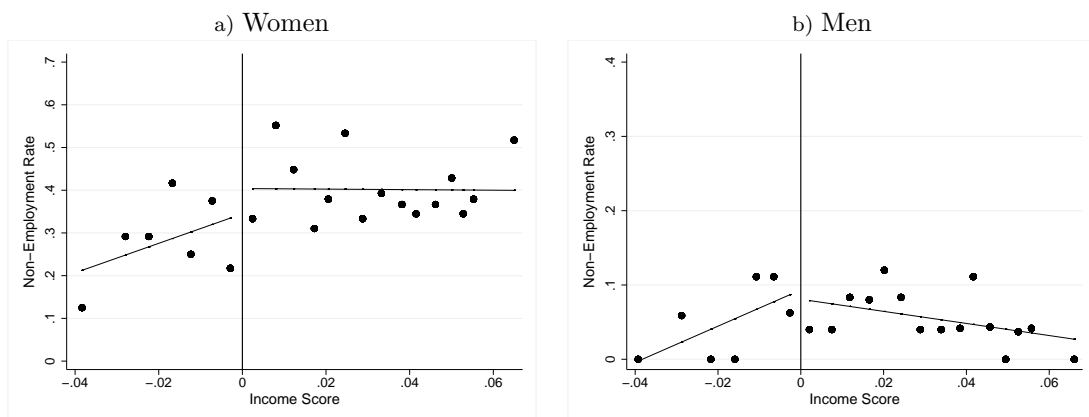
Figures

Figure 1: Assignment to AFAM-PE: program eligibility and participation
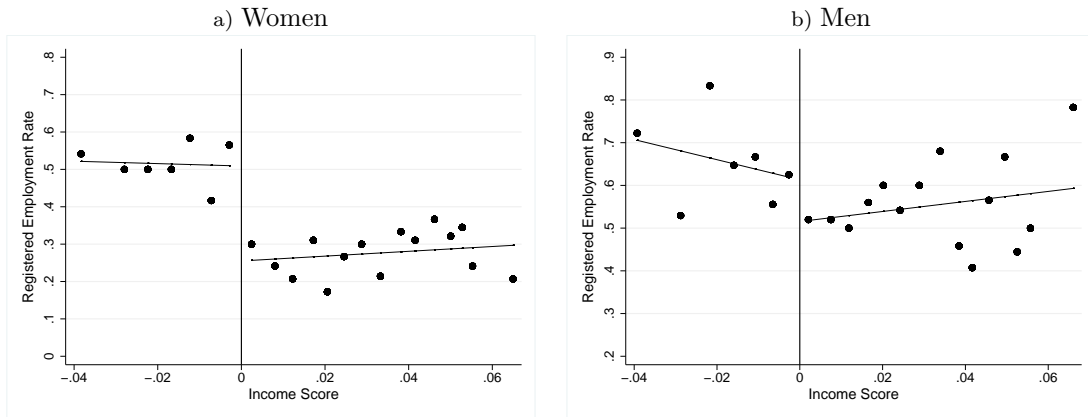

Notes: The figure plots the proportion of households that participate in AFAM-PE against the predicted income score at the time of the application to the program. The dataset corresponds to the AFAM baseline application records (January 2008 to September 2010). The sample includes two-parent households with individuals between 18 and 64 years of age and children under 18 years old interviewed at the the follow-up survey. The income score is standardized so that the eligibility threshold is zero, with positive scores indicating (individuals in) eligible households. Each point (black circle) in the plot represents the percentage of individuals in applicant households that participated in AFAM-PE in eligibility score bins with a width of (approximately) 0.5 percentage point of the score bins. The solid represents the predicted values of a first order polynomial on the standardized income score estimated at each side of the eligibility threshold.

Figure 2: Non-employment rate and AFAM-PE eligibility, coupled women and men

a) Women   b) Men
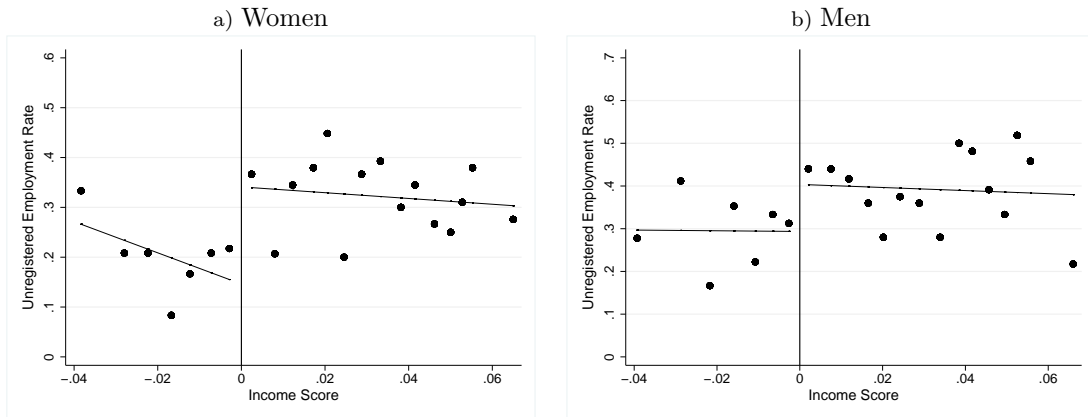

Notes: The figure plots non-employment against the predicted income score. The dataset corresponds to the AFAM baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). The sample includes two-parent households with individuals between 18 and 64 years of age and children under 18 years old interviewed at the the follow-up survey. The income score is standardized so that the eligibility threshold is zero, with positive scores indicating (individuals in) eligible households. Each point (black circle) in the plot represents the percentage of individuals in applicant households that participated in AFAM-PE in eligibility score bins with a width of (approximately) one percentage point of the score bins. The solid line represents the predicted values of a first order polynomial on the standardized income score estimated at each side of the eligibility threshold.

Figure 3: Registered employment rate and AFAM-PE eligibility, coupled women and men
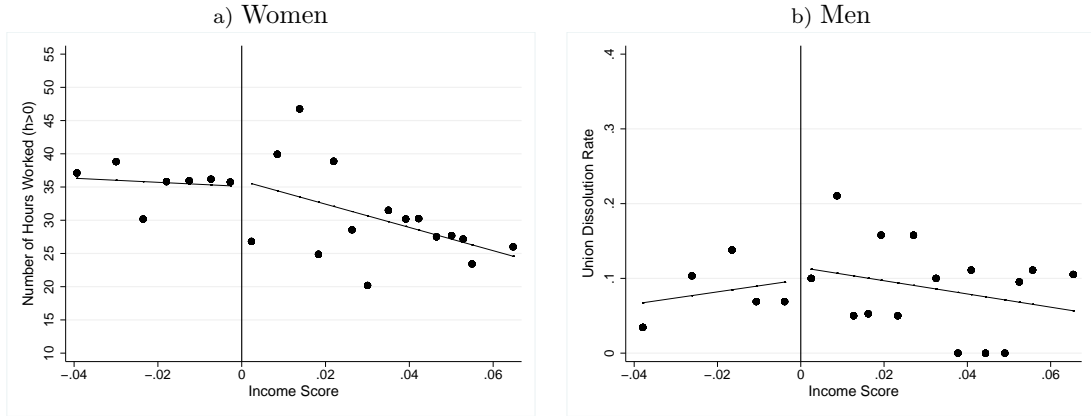
a) Women

b) Men

Notes: The figure plots registered employment against the predicted income score. The dataset corresponds to the AFAM baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). The sample includes two-parent households with individuals between 18 and 64 years of age and children under 18 years of age interviewed at the the follow-up survey The income score is standardized so that the eligibility threshold is zero, with positive scores indicating (individuals in) eligible households. Each point (black circle) in the plot represents the percentage of individuals in applicant households that participated in AFAM-PE in eligibility score bins with a width of (approximately) 0.5 percentage point of the score bins. The solid line represents the predicted values of a first order polynomial on the standardized income score estimated at each side of the eligibility threshold.

Figure 4: Unregistered employment rate and AFAM-PE eligibility, women and men in couple
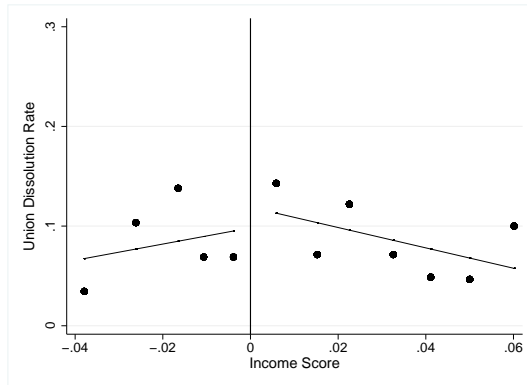
a) Women

b) Men

Notes: The figure plots unregistered employment against the predicted income score. The dataset corresponds to the AFAM baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). The sample includes two-parent households with individuals between 18 and 64 years of age and children under 18 years of age interviewed at the the follow-up survey The income score is standardized so that the eligibility threshold is zero, with positive scores indicating (individuals in) eligible households. Each point (black circle) in the plot represents the percentage of individuals in applicant households that participated in AFAM-PE in eligibility score bins with a width of (approximately) 0.5 percentage point of the score bins. The solid line represents the predicted values of a first order polynomial on the standardized income score estimated at each side of the eligibility threshold.

Figure 5: Hours worked (conditional on working) and AFAM-PE eligibility, coupled women and men

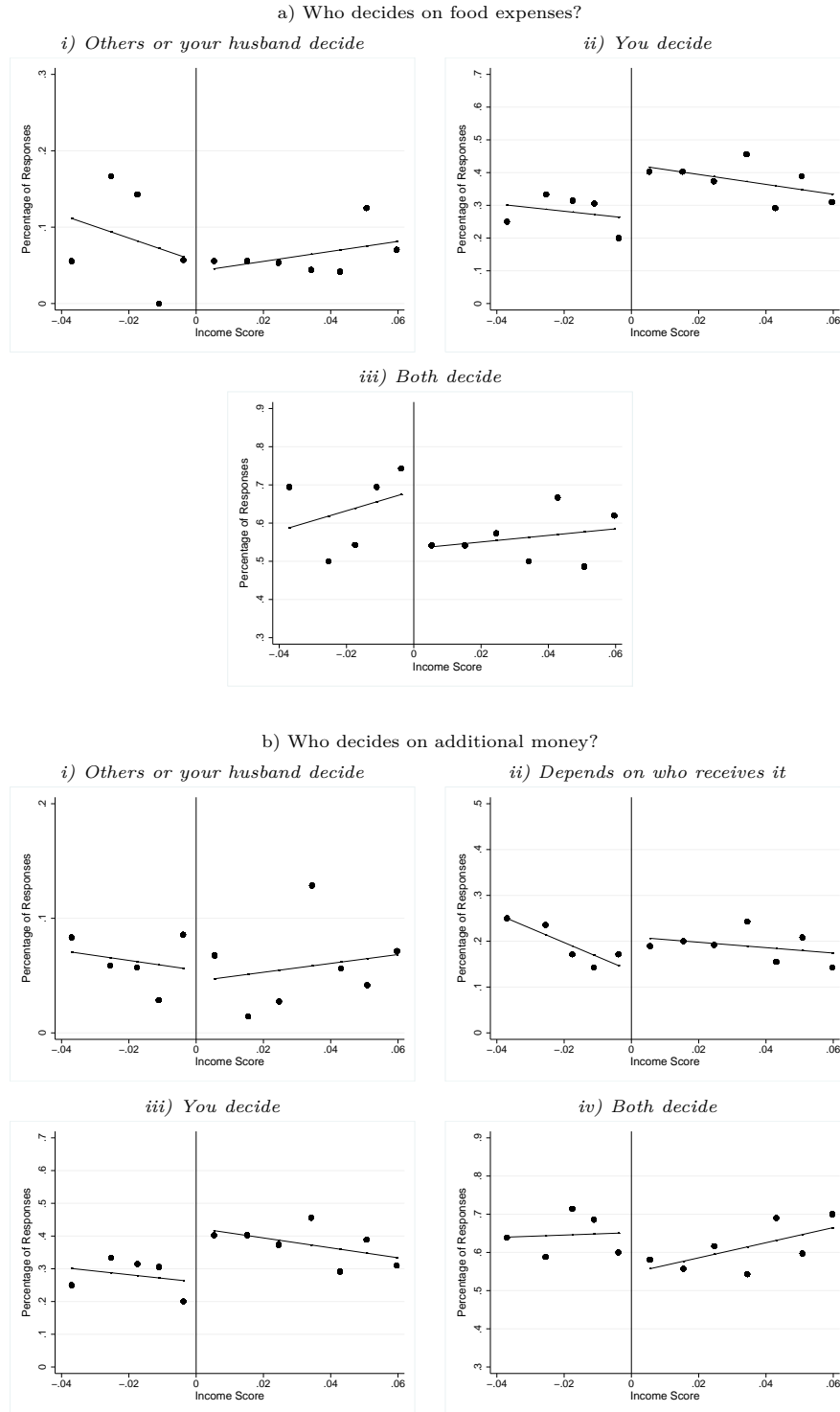a) Women   b) Men

Notes: The figure plots hours worked (conditional on working) against the predicted income score. The dataset corresponds to the AFAM baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). The sample includes two-parent households with individuals between 18 and 64 years of age and children under 18 years of age interviewed at the the follow-up survey. The income score is standardized so that the eligibility threshold is zero, with positive scores indicating (individuals in) eligible households. Each point (black circle) in the plot represents the percentage of individuals in applicant households that participated in AFAM-PE in eligibility score bins with a width of (approximately) 0.5 percentage point of the score bins. The solid line represents the predicted values of a first order polynomial on the standardized income score estimated at each side of the eligibility threshold..

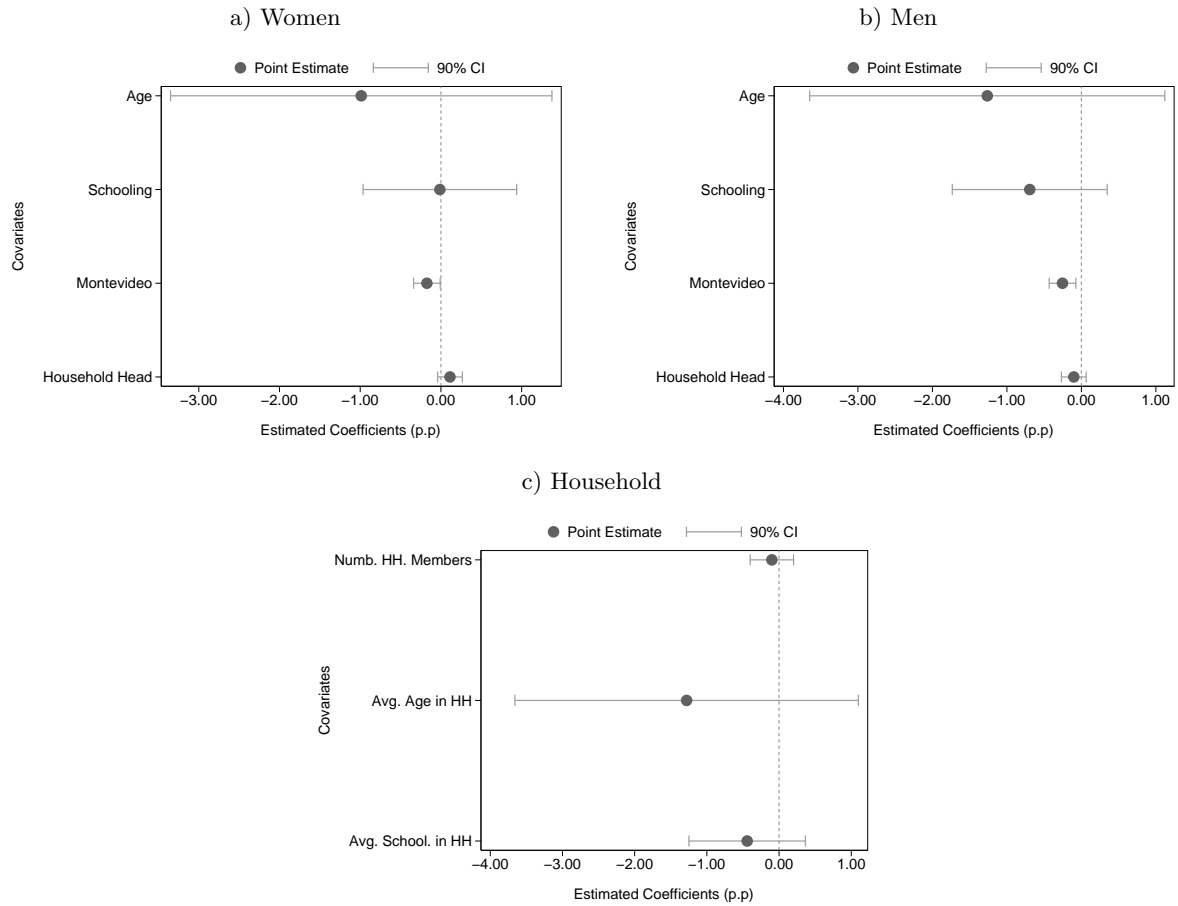Figure 6: Union dissolution rate and AFAM-PE eligibility

Notes: The figure plots unregistered employment against the predicted income score. The dataset corresponds to the AFAM baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). The sample includes two-parent households with individuals between 18 and 64 years of age and children under 18 years old interviewed at the the follow-up survey. The income score is standardized so that the eligibility threshold is zero, with positive scores indicating (individuals in) eligible households. Each point (black circle) in the plot represents the percentage of individuals in applicant households that participated in AFAM-PE in eligibility score bins with a width of (approximately) 0.5 percentage point of the score bins. The solid line represents the predicted values of a first order polynomial on the standardized income score estimated at each side of the eligibility threshold.

Figure 7: Decision-making at the household level and AFAM-PE eligibility, coupled women and men

a) Who decides on food expenses?

i) Others or your husband decide

ii) You decide

iii) Both decide

b) Who decides on additional money?

i) Others or your husband decide

ii) Depends on who receives it

iii) You decide

iv) Both decide

Notes: The figure plots decision-making outcomes against the predicted income score. The dataset corresponds to the AFAM baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). The sample includes two-parent households with individuals between 18 and 64 years of age and children under 18 years of age interviewed at the follow-up survey The income score is standardized so that the eligibility threshold is zero, with positive scores indicating (individuals in) eligible households. Each point (black circle) in the plot represents the percentage of individuals in applicant households that participated in AFAM-PE in eligibility score bins with a width of (approximately) 0.9 percentage point of the score bins. The solid line represents the predicted values of a first order polynomial on the standardized income score estimated at each side of the eligibility threshold.

Figure 8: RD estimates of the effect of AFAM-PE on pre-treatment individual characteristics
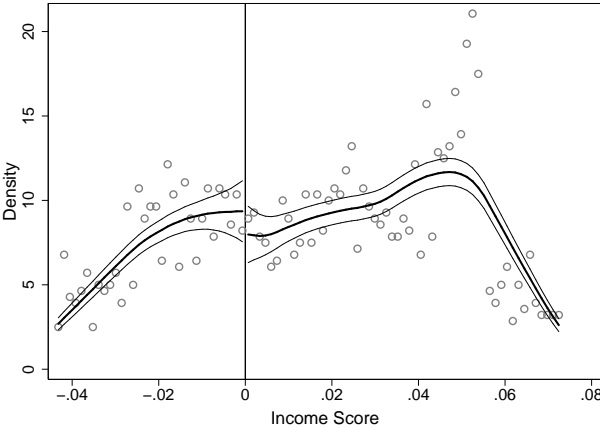
a) Women

b) Men

c) Household

Notes: The figure plots decision-making outcomes against the predicted income score. The dataset corresponds to the AFAM baseline application records matched with information from the program's follow-up survey data (see Section 4.1 for a detailed description of the data). The sample includes two-parent households with individuals between 18 and 64 years of age and children under 18 years of age interviewed at the the follow-up survey The income score is standardized so that the eligibility threshold is zero, with positive scores indicating (individuals in) eligible households. Each point (black circle) in the plot represents the percentage of individuals in applicant households that participated in AFAM-PE in eligibility score bins with a width of (approximately) 0.9 percentage point of the score bins. The solid line represents the predicted values of a first order polynomial on the standardized income score estimated at each side of the eligibility threshold.

Figure 9: Density of the forcing variable (predicted income score), relative to the cut-off

Notes: The figures plot the density of the predicted income score in the vicinity of the eligibility cut-off. The solid red line plots predicted values from a local linear regression (with a width of one half of a percentage point) with separate score trends estimated on either side of the eligibility threshold. The dashed lines show 95% confidence intervals. The bandwidth is chosen using the Imbens-Kalyanaraman bandwidth selection rule (2012), and a rectangular kernel is used. The point estimate (standard error) for the test is -0.157 (0.155). The optimum bandwidth and size ranges are calculated following McCrary (2008).

Intra-household Behavioral Responses to Cash Transfer Programs.
Evidence from a Regression Discontinuity Design

Marcelo Bergolo and Estefania Galvan

A.1 Overview of household behavioral models

A.1.1 Nash bargaining model

The initial developments, in line with the neoclassical tradition, consist in a deepening of the individualistic foundations of consumer theory by claiming that the members of the household should be considered independently rather than all together as maximizing agents. In this framework, Manser & Brown (1980) and McElroy & Horney (1981), proposed models that rely on cooperative game theory based on a Nash's solution. In the simplest case of negotiation, there are two people with well-defined interests and clearly perceived in the form of two respective utility functions. These people can choose to cooperate or not. When they do not cooperate we face what is called a "fall-back position." The bargaining problem arises from the existence of the many collusive arrangements possible, each one better than their fall-back positions, or outside options for both members (e.g. divorces). As consequence of this bargaining process, each individual according to his/her preferences tries to allocate the household income towards his/her personal needs and preferred goods.

Following McElroy & Horney (1981), the household maximizes a utility-gain function (represented by a "Nash-product" function), subject to a pooled budget constrain, as expressed bellow:

$$W = \left[U^f(X; k^h, \mu^h) - V^f(p^0; \Phi^f) \right] * \left[U^m(X; k^h, \mu^h) - V^m(p^0; \Phi^m) \right]$$

$$\Phi^i = \Phi(e, y^i, P^i; k^i, \mu^i)$$

where the superscripts on the individual utility functions indicate male (m) or female (f), X represents the consumption vector (including leisure), V is the reservation indirect utility function, prices are partitioned into public (p^0) and private (p^i) good prices, and Φ^i represents a function of the characteristics that influence the outside options of each of the members of the couple, if the bargaining process fails. The outside options depend on the distribution of non-labor income and parameters (e) that influence the status under the threat point condition but do not affect preferences or the budget constraint.[35] These parameters, also called "distributional factors" include, for instance, indicators for the (re)marriage market competitiveness, laws governing divorce, or child support.

Households are constrained in time and by their budgets, which are represented by the following equations:

$$P.X = (w^f l^f + w^m l^m) + (y^f + y^m)$$

$$P = (p; w^f; w^m)$$

$$Y = y^f + y^m$$
$$L = l^f + l^m$$

where w is the market wage, l is the time allocated to work and y is the individual-level non-labor income. The consumption goods can be bought in the market at a price p. The reduced-form demand function is represented by:

$$X^i = X(P, Y, e, y^m, y^f; k^h, \mu^h)$$

Notice that the demands functions depend on the "distributional parameters", as well as on the allocation of income between the heads and not just on total income - i.e., income pooling no longer hold.

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[35] The threat points represent the maximal utility from some kind of a default outcome. In general, this default case has been interpreted as an outside option that is external to the household (e.g. divorce).

A.1.2 Collective model

The collective model is a generalization of the Nash bargaining model (see Chiappori, 1992, 1988; Bourguignon et al., 1995; Browning & Chiappori, 1998; Chiappori & Ekeland, 2009). Such types of models abstract from a specific bargaining rule, and the only requirement is that the individuals in the decision-making process reach Pareto-efficient agreements.

In the basic collective model, the household maximizes its utility function W composed by the utility functions of both heads, represented by:

$$W = \theta U^f(X, k^h, \mu^h) + (1 - \theta)U^m(X, k^h, \mu^h)$$

where k^h and μ^h represent observed and unobserved characteristics of the household, and the parameter θ (known as Pareto weights), belonging to the unit interval, reflects the relative importance of each of the heads in the total household utility. The maximization is constrained to the same budget constraint as above. If the weighting parameter is assumed to be constant, the collective framework corresponds to the consensus unitary model as in Samuelson (1956). The "Beckerian" dictator model is reproduced if the weight factor is set at one or zero. If the weighting parameter is assumed to be a function (as above) of prices, income distribution across households heads, and distributional factors, $\theta(e, y^f, y^m, P)$, the solution of the household problem for each individual gives the following demand function:

$$X^i = X(P, Y, L, k^h, \mu^h, \theta)$$

which depends on the weights of the respective bargaining powers, the prices of work and goods, the time allocated to work by each member and the respective individual-level non labor-incomes, as follows. As before, from this setup, an increase in the bargaining power of one of the heads should move the household's consumption according to his/ her preferences, and income pooling not necessarily hold.

Finally, notice that under the unitary household approach, changes in bargaining power have no effect on outcomes (no role for weight θ, or the non-dictator utility function gets zero weight in W). Therefore, the solution under the unitary household gives a demand function for each household-member of the form:

$$X^i = X(P, Y, L, k^h, \mu^h)$$

A.2 Non-response and sample selection bias

This section evaluates the extent of the follow-up non-response and assesses the likely possible effects or biases on the ensuing analysis. If the observed non-response is correlated with the probability of being eligible, this could lead to bias in the estimates of program effects. As documented in Table A.1, the non-response rate for the overall follow-up sample is 40.4%, and this rate is a statistically significant 4.9 percent points lower in the group of eligible households relative to the group of ineligibles (43.6%). However, as Panel *(b)*, column (5) in Table A.1 shows for the sample of two-parent households, the rate of non-response is marginally lower for the eligible households relative to the ineligibles (37.6% vs. 39.6%) and the difference is statistically insignificant at the 5 percent level.

To examine the extent of non-response on observables and the nature of potential sample selection bias, Panel *(c)* in Table A.1 compares main baseline characteristics between non-responders and responders for the sample of two-parent households.[36] Due to the availability of the program's administrative records, which include a variety of information about the households at the time that they applied to AFAM-PE, there is information on those households not interviewed in the follow-up survey. Column (1) reports mean values of a series of baseline individual and household characteristics for the total sample of analysis, while columns (2) and (3) show the estimates for the non-responders and the difference between this group and those who were successfully

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[36]Estimates for the overall follow-up sample show qualitatively similar results and are available upon request.

interviewed, respectively. Overall, the heads in the interviewed households are older and less educated than those in non-responders. In addition, those households who answered are less likely to be located in the capital city of Uruguay (i.e. Montevideo); they present a higher number of members who are, on average, older and less educated that those non-responders. OLS regressions that use the non-response indicator as a dependent variable, and include the full set of baseline characteristics, indicate that non-response is indeed not random.[37]

Next, the analysis focuses on evaluating whether different non-response rates may cause selection bias between eligible and ineligible households. Columns (4) and (5) in Panel *(c)*, compare main baseline characteristics of non-responding households between both groups. Only a few significant differences are found: parents in eligible responder households are less educated, it is less likely that the household is located in Montevideo, and, on average, they have older adult members, in comparison with those in the ineligible group. Estimates for the probability of not having been interviewed on baseline characteristics, the indicator for eligibility, and the interactions between the eligibility indicator and these characteristics, suggests that there is no selection on observables for two-parent households in the group of eligible households. [38]

In sum, the analysis above suggests that two-parent households who were not interviewed are selected relative to those who responded to the survey along the observable characteristics, however, this selection is not (statistically) relevant for those eligible relative to those in the counterpart group. This last result is consistent with results found by performing the RD analysis on the baseline covariates (see section 5.4). While the result of non-systematic correlation in observables between eligibility for AFAM-PE and non-response to the survey protect the RD estimates from internal validity concerns (related to this issue), the drawback is on the ground of external validity. That is, the empirical findings cannot be generalized to the whole population at baseline but only to those adults in two-parent households that were interviewed for the follow-up survey.

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[37] Joint tests of significance of the correlation for each baseline characteristic indicates that the correlations are significantly different from zero (F-test statistic [p-value] is $F(14, 448)=63.226$ [0.000]).

[38] Joint tests of significance of the correlation for each interaction between the baseline characteristic and the eligibility dummy indicates that the correlations are not significantly different from zero (F-test statistic [p-value] is $F(10, 448)=0.997$ [0.445]).

A.3   Additional Results: Tables

Table A.1: Household non-response: comparison of households characteristics at baseline

	Total	Total		Non-responders	
		Non-responders	Diff.	Ineligibles	Diff elegible vs ineligibles
	(1)	(2)	(3)	(4)	(5)
(a) All sample					
N of households	3565	1441	-	542	-
Share	1.000	0.404		0.436	-0.049***
					[0.017]
(b) Two-parent households					
N of households	611	234	-	80	-
Share	1.000	0.383		0.396	-0.020
					[0.042]
(c) Baseline characteristics (two-parent household)					
Men	0.499	0.499	-0.000	0.497	0.003
	[0.500]	[0.501]	[0.029]	[0.502]	[0.049]
Age between 18-25 years old	0.036	0.049	-0.022**	0.050	-0.001
	[0.186]	[0.217]	[0.011]	[0.219]	[0.021]
Age between 26-40 years old	0.555	0.600	-0.071**	0.623	-0.034
	[0.497]	[0.490]	[0.029]	[0.486]	[0.048]
Age between 41-55 years old	0.379	0.320	0.093***	0.308	0.019
	[0.485]	[0.467]	[0.028]	[0.463]	[0.046]
Age between 56-64 years old	0.029	0.028	0.002	0.019	0.014
	[0.169]	[0.165]	[0.010]	[0.136]	[0.016]
Age more than 65 years old	0.001	0.002	-0.002	0.000	0.003
	[0.028]	[0.046]	[0.002]	[0.000]	[0.005]
Years of education 0	0.001	0.002	-0.002	0.000	0.003
	[0.028]	[0.046]	[0.002]	[0.000]	[0.005]
Years of education between 1-6	0.463	0.415	0.076***	0.346	0.105**
	[0.499]	[0.493]	[0.029]	[0.477]	[0.048]
Years of education between 7-12	0.512	0.546	-0.054*	0.616	-0.107**
	[0.500]	[0.498]	[0.029]	[0.488]	[0.049]
Years of education more than 12	0.024	0.037	-0.020**	0.038	-0.002
	[0.153]	[0.188]	[0.009]	[0.191]	[0.018]
Household head	0.504	0.503	0.002	0.503	0.000
	[0.500]	[0.501]	[0.029]	[0.502]	[0.049]
Montevideo	0.303	0.340	-0.058**	0.465	-0.191***
	[0.460]	[0.474]	[0.027]	[0.500]	[0.049]
Household size between 1-3 people	0.364	0.449	-0.136***	0.434	-0.024
	[0.481]	[0.498]	[0.028]	[0.497]	[0.049]
Household size between 4-5 people	0.591	0.538	0.085***	0.553	0.000
	[0.492]	[0.499]	[0.029]	[0.499]	[0.011]
Household size more than 5 people	0.045	0.013	0.051***	0.013	0.250
	[0.208]	[0.113]	[0.012]	[0.112]	[0.786]
Household average age for older than 18	39.266	38.416	1.348***	38.252	-0.747***
	[7.912]	[8.036]	[0.461]	[7.319]	[0.245]
Household average years of education	7.446	7.716	-0.429***	8.208	0.003
	[2.427]	[2.532]	[0.141]	[2.513]	[0.245]
F-test			63.226		0.997
P-value			0.000		0.445
Max N			1,259		1,259

Notes: Two-parent households sample include women and men between 18 and 64 years old with children aged 17 or less. The standard errors (in brackets) correspond to clusters by standardized predicted income score. "F-test" and "P-value" in column (3) and (5) present results for a joint test of significance from one regression for non-response with main covariates correlation and covariates interacted with eligibility indicator, respectively. *significant to 10%; **significant to 15% ***significant to 1%.