



The impact of a social program on labor informality: The case of AUH in Argentina[☆]



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ABSTRACT

The recent Universal Child Allowance program in Argentina provides monthly cash transfers to unregistered workers with children. As the program is accessible only to those who are not in formal employment, it may discourage workers' transitions to the formal sector. In this paper we estimate this effect by comparing the transitions to registered jobs of eligible workers (with children) with a similar but not eligible group (without children) over time. The results suggest a statistically significant and economically large disincentive to the labor market formalization of the program beneficiaries. In contrast, there is no sufficient evidence for the existence of a significant incentive for registered workers to become informal.

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1. Introduction

Social protection systems in Latin America have traditionally followed a Bismarckian scheme, in which social and labor benefits are linked to the employment in the formal sector of the economy. In countries where informality is widespread, this scheme leaves a large proportion of the population without protection, generating a “truncated” Welfare State. Since the late 1990s all countries in the region have launched initiatives to alleviate this imbalance, implementing cash transfer programs targeted to poor households.¹

The evidence indicates that these programs have played an important role in the short-term reduction of poverty and income inequality in the region, and it also suggests long-term positive impacts through the promotion of assets and human capital accumulation in poor families (Fiszbein and Schady, 2009). However, there is concern about

some potential undesirable effects of these programs, particularly on the labor market. Specifically, the extension of benefits to unemployed and informal workers could involve a labor supply disincentive and a bias towards unregistered labor arrangements. The existence and quantitative relevance of these unwanted effects are at the core of the current social protection debate in Latin America. The economic literature on the impact of massive income programs over the labor markets, still incipient in the region, may imply a relevant contribution to the design of more effective social protection schemes and employment policies.²

This study contributes to this literature, assessing the potential impact on labor informality of a large cash transfer program implemented in Argentina, targeted to unregistered workers. Specifically the Universal Child Allowance for Social Protection (AUH for its acronym in Spanish) provides a monthly benefit per child to households whose members are unemployed or working in the informal sector (*i.e.* unregistered).³ The AUH is a massive conditional cash transfer program launched in 2009, which covers 29% of all children and 15% of total households in Argentina. The benefit per child represents 8.8% of the mean household income for unemployed and informal households with children (*i.e.* the potential beneficiaries of the program), and 15.3% of the mean for those in the bottom three deciles of the income distribution. For a typical household in that group with three children the benefit implies an increase of

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¹ The literature that analyzes this social protection scheme and proposes alternative reforms has strongly grown during the last years. See Bertranou et al. (2002), Van Ginneken (2002), Levy (2008), Fiszbein and Schady (2009), Ferreira and Robalino (2010), UNDP (2010), Cruces and Gasparini (2012), Cecchini and Martínez (2011), Maldonado et al. (2011), Antón et al. (2012) and OIT (2012).

² See Alzúa et al. (2013), Amarante et al. (2011), Azuara and Marinescu (2013), Bosch and Manacorda (2012), Camacho et al. (2009), Bérgolo and Cruces (2013), and Gasparini et al. (2009).

³ Labor informality can be a vague concept; in this paper we use it to refer to unregistered workers without rights to social security benefits linked to their jobs. See section 3 for more details.

45.9% in total household income. These values place the AUH benefit among the largest in Latin America (Stampini and Tornarolli, 2013).

The cash transfer to unemployed and informal workers may reduce their participation in the formal sector compared to the counterfactual situation (absence of the program), by lowering the relative payoff of being a registered employee with rights to social benefits. The AUH program introduces an important additional factor in the workers' decision set and in the bargaining process between employers and employees, which can be decisive in the resulting labor informality status of some program participants.

Unfortunately, it is not simple to identify the causal effect of the program since it was not randomly assigned in the population. In addition, no questions aimed at identifying AUH beneficiaries were introduced in the national household survey of Argentina. Due to these constraints, our identification strategy consists in comparing eligible workers (with children) with similar but non-eligible workers (without children) over time. This strategy of *difference in differences* is effective in alleviating several endogeneity problems that arise when comparing heterogeneous observations.

The evidence suggests that while formalization (entry rate into registered jobs) of both groups (eligible and non-eligible) follows an almost identical path before the end of 2009, the patterns significantly diverge from that date, which coincides with the implementation of the AUH. While the entrance rate into the registered sector increased in the group of workers without children since 2010, coinciding with an expansion of the Argentinean economy, it remained approximately constant for informal workers with children, *i.e.* the potential participants of the AUH program.

Given these results that we confirm through a conditional econometric analysis, given the theoretical reasons to link the program with labor formality outcomes, and given the absence of alternative sensible explanations of the divergent behavior between program participants and the rest after the implementation of the program, we conclude by suggesting the existence of a significant formality disincentive of the Universal Child Allowance program. In contrast, we find no sufficient evidence for the existence of an incentive for registered workers to become informal.

Our results suggest a statistically significant and economically large effect. We find that the probability of formalization of the treatment group is reduced between 28% and 43%, respect to what would have happened in the absence of the program. We argue that the large size of the cash benefit may account for such a sizeable effect: for a typical poor informal worker with three children the transfer represents more than 25% of his/her expected wage in the formal sector.

The rest of the paper is organized as follows. In Section 2 we explain the main characteristics of the Universal Child Allowance program, while in Section 3 the potential labor incentives caused by this policy are discussed. Section 4 describes the data used in this study and lays out the methodology, while Section 5 presents the main findings. We conclude in Section 6 with some final remarks.

2. The program

As in other Latin American countries, social protection policies in Argentina were closely tied to formal employment. Non-contributive schemes have evolved rather uncoordinated providing different types of categorical benefits.⁴ Massive cash transfer programs towards unregistered workers were typically triggered by a socioeconomic emergency. The programs *Trabajar* and *Jefes de Hogar* (PJH) are the two main examples in this sense. The former was designed to mitigate the effects of rising unemployment in the mid-1990s, while the latter was

⁴ Some examples in this sense are the old age and disability pensions, social benefits towards mother with more than seven children, pensions targeted to veterans, families of missing people (during the last military dictatorship) and other benefits from special laws (Bertranou and Grushka, 2002).

implemented in 2002 to alleviate the impact of the deep economic crisis that took place at the beginning of the 2000s.

In the last quarter of 2009, under a more stable economic situation,⁵ the Argentinean government implemented, with ample political support, a new massive program of conditional cash transfers to poor households. Specifically, the decree 1602/09 created the Universal Child Allowance for Social Protection (AUH) which consists in a monetary subsidy per child for households whose members are either unemployed or working in the informal sector (unregistered workers).^{6, 7} Although the decree restricts participation to those unregistered workers earning less than the legal minimum wage, this condition is difficult to monitor, and hence in practice the limitation is inconsequential.

The AUH program transfers monthly ARG\$ 180 (around US\$ 50) for each child under 18 years old up to a maximum of 5 dependent children. The corresponding benefit for disabled children (no age restrictions) was initially set at ARG\$ 720. The monthly amount per child has been adjusted annually to shield the purchasing power of the subsidy against inflation.⁸

As in any typical conditional cash transfer program, the AUH requires compliance with education and health requirements. In particular, 20% of the monthly benefit can only be made effective upon fulfillment of the conditionalities: vaccination and health checks for children under 4 years old and school attendance for those aged 5 or older. The recipients of AUH are not allowed to receive benefits from other social programs.

This cash transfer program covers a large proportion of the Argentinean population, the majority belonging to low-income strata. In 2011 the AUH covered 3.6 million children, which represent 29% of all children in the country (15% of total households). The annual budget of the program – around 0.8% of GDP – is one of the highest in Latin America. The monetary benefit is also high according to international standards (Fiszbein and Schady, 2009). For a typical poor family with three children whose members are unregistered workers, the benefit implies an increase of 45.9% in household income. The cash transfer for a typical poor informal worker with three children represents 90% of his/her labor income. Compared to earnings in the formal sector the benefit is also large: the monthly transfer to a poor informal worker with three children represents 26.5% of the predicted wage in the formal sector,⁹ and around 40% of the legislated minimum wage.

Being such a large program, the AUH potentially has a significant impact on economy-wide social and labor variables. So far, the literature has focused on the impact of the program on poverty, inequality and education. According to the existing estimates, which typically ignore potential changes in individuals' behavior after the program, the AUH had a significant impact on the reduction of poverty and income inequality, and some positive results on school attendance levels (Agis et al, 2010; D'Elia and Navarro, 2011; Gasparini and Cruces, 2010; Paz and Golovanevsky, 2011; Rofman and Oliveri, 2011a, 2011b). In contrast, there are almost no studies assessing the impact of the program on the labor market.¹⁰

⁵ In fact, after several years of growth, per capita GDP did not grow in 2009. Nevertheless, unemployment barely increased while income poverty was reduced in the year previous to the AUH program (see Figure A in the Appendix).

⁶ Registered workers already had a similar benefit (law 24.714 of 1996).

⁷ The eligibility conditions are simple, and hence easily enforced: to participate a couple (or a single parent) should have a child, and none of the parents should be registered as a formal worker in the national social security system. The available evidence suggests that problems of misreporting have been rare (ANSES, 2012; D'Elia et al., 2010).

⁸ The child allowance increased to ARG\$ 220 (ARG\$ 880 for disabled children) in October 2010 (decree 1388/10), while in September 2011 (decree 1482/11), after a new adjustment, the program amount reached ARG\$ 270 (ARG\$ 1080 for disabled children).

⁹ Earnings in the formal sector include child allowances and other monetary benefits. The scheme of child allowances in that sector depends on earnings and geographical location. For most low-income formal workers the amount of the child allowance is similar to that of the AUH.

¹⁰ Using a different strategy to our paper (transitions around the date of the intervention) Maurizio and Vazquez (2012) find that in the short run the program did not discourage adults from working or lead to a reduction in the number of hours worked.

3. Disincentives to labor formality

Informality is a term used with different meanings in different contexts.¹¹ In this study we define an informal job as one in which the employment relationship is not subject to labor legislation and taxation, and consequently the worker has no access to social benefits neither entitled to certain labor rights linked to employment (OIT, 2002).¹² Labor formalization is then the transition from an unregistered unprotected job to a registered one with labor social benefits. In this section we discuss some channels by which a non-contributory social program such as AUH could reduce the incentives for labor formalization.

The analysis of informality was traditionally focused on the firm's decisions over the registration of the activity and the payment of labor taxes, assuming a passive role for workers.¹³ In this framework the introduction of a program targeted to informal workers and funded with general revenues would not affect the decisions of formal firms, and therefore would have no impact on the level of formal employment in the economy. A more recent approach proposes to enrich the analysis of labor informality by incorporating non-pecuniary preferences of workers.¹⁴ Galiani and Weinschelbaum (2012), for example, suggest a model in which firms choose to operate whether formally or informally depending on their managerial ability, while workers decide optimally in which sector (formal or informal) they locate according to their human capital endowment. In this model wages and formal sector size are determined endogenously. In particular, universal coverage initiatives deteriorate the incentives to participate in the formal labor market. Levy (2008) and Antón et al. (2012) also show in an analytical model how the extension of social benefits to informal workers, funded by general revenues, increases informal workers' utility relatively to those in formal jobs, generating a higher informality rate in equilibrium.

In the rest of this section we discuss the potential incentives on labor formalization of the introduction of the AUH in Argentina, treating separately the situation of three types of informal workers: (i) the self-employed, (ii) unregistered salaried workers and (iii) the unemployed.

3.1. Self-employed workers

There are two typical alternative approaches to analyze self-employment: the integrated and the segmented-labor-market views.¹⁵ According to the former, salaried jobs and self-employment are two substitute alternatives for workers, with their associated costs and benefits that a person evaluates in order to make a choice between them. Although self-employed work typically involves more volatility and often lower income with no social benefits, it may provide non-pecuniary benefits in terms of lack or more flexible time schedules, authorities and controls. "Being your own boss" could be an important benefit of self-employment for many individuals. For example, people with limited or variable time availability (e.g. women with children, young students and the elderly) may prefer self-employment rather than being tied to a formal job, which typically requires meeting certain time obligations. In summary, some individuals might choose to be self-employed, even when that alternative implies the absence of social benefits. Naturally, in this context the introduction of a benefit targeted to the group of informal workers (a group that includes the self-

employed), such as the AUH, generates a clear disincentive for the transition between self-employment and a formal registered job.¹⁶

Instead, in the segmented-labor-market approach the formal employment alternative dominates the self-employment one. Even considering the above arguments, this view argues that in practice for the vast majority of workers a formal job is more valued than the self-employment option with no social benefits. The presence of unions, minimum wages or entry restrictions into public sector jobs make the gap sustainable in equilibrium, despite self-employed workers' pressure to enter the privileged sector. According to this labor market view, the introduction of a monetary benefit for informal workers narrows the gap with the registered salaried employment but it does not necessarily eliminate it. Therefore, the potential disincentive to formality of a program such as the AUH may not materialize in practice if the initial gap is wide enough.

3.2. Unregistered salaried workers

The argument of non-pecuniary benefits discussed above becomes less relevant in the comparison between formal and informal salaried jobs. Then, can an unregistered salaried job be preferred to a registered one? One scenario in which this alternative is possible is that of social benefits of formal employment funded by payroll taxes, coupled with an inelastic labor supply. In this framework, formal employees would be "buying" their benefits with a salary cut. Hence, if there are leakages in this process or the benefit's valuation is not high enough, the informality option may not be dominated. In this case, the introduction of a benefit such as the AUH, that can be claimed only by informal workers and that is funded by general revenues, represents a clear disincentive to formalization of unregistered salaried workers.

In practice labor supply may not be inelastic, and consequently part of the social protection cost of formal employment would fall on employers or the state. In that case, social protection constitutes a real benefit for formal employees, and therefore an incentive for informal salaried workers to put pressure on firms to formalize them. Of course, social protection contributions and deductions represent a labor cost to firms, so they will try to avoid them as a cost-minimizing mechanism. Antón et al. (2012) present an optimal decision model of informal employment of firms, in which they compare the gains of evading labor taxes and work regulations with the penalizing cost of being caught and punished. De Paula and Scheinkman (2010) show how labor informality has an additional benefit by increasing the value of avoiding other taxes (such as VAT).

The outcome of a situation in which informal salaried workers push for registration and social benefits, while firms try to avoid that cost, will be determined by a bargaining process for social benefits. The result of that negotiation is determined by market conditions, institutional restrictions and the value of the object of negotiation (social benefits in this case) for each participant.¹⁷ In this sense, non-contributive benefits, such as the AUH, reduce the relative benefit of formality for unregistered salaried workers, decrease their bargaining power and consequently make more unlikely the formality outcome of the negotiation.

3.3. Unemployed

The potential incentives among unemployed people are similar to those previously described in the case of informal workers, since in Argentina the vast majority of individuals in this group lack social benefits. Since the AUH is aimed at informal workers as well as the unemployed (or those inactive people who declare to be unemployed), the

¹¹ "Informality is a term that has the dubious distinction of combining maximum policy importance and political salience with minimal conceptual clarity and coherence in the analytical literature" (Kanbur, 2009).

¹² See Portes et al. (1986) and Saavedra and Chong (1999) for further discussion.

¹³ See Rauch (1991), Straub (2005) and Patrap and Quintin (2006).

¹⁴ See Maloney (2004), Antón et al. (2012) and Galiani and Weinschelbaum (2012).

¹⁵ Portes and Schaffler (1993), Maloney (2004) and Perry et al. (2007).

¹⁶ The fact that formal jobs already provide a child allowance benefit similar to the AUH does not modify the argument. It is the introduction of a new social benefit for informal workers what may change the equilibrium and generate the effect that we seek to identify in the paper.

¹⁷ The literature of wage bargaining is large; see for example McDonald and Solow (1981) and Farber (1986).

introduction of this cash transfer program reduces the relative advantage of a formal job compared to unemployment (or inactivity). If the utility gap between unemployment and a registered work was null or small before the program, the new benefit may discourage the transition from unemployment to a formal job.

As argued in this section, there are several reasons to believe that the AUH may reduce the incentives to labor formalization. However, in practice, these disincentives could be quantitatively irrelevant or be compensated by forces operating in other directions that were not considered in this analysis. The practical relevance of the potential disincentives of the program can only be determined with empirical evidence.

The literature on the impact of cash transfer programs on labor informality in Latin America is still scarce and far from conclusive (Bosch and Manacorda, 2012). While Amarante et al. (2011) find a large disincentive effect on formality from the Uruguayan PANES, and Gonzalez-Rozada and Pinto (2011) report a positive significant effect of the Ecuadorean *Bono de Desarrollo Humano* in the transitions out of formal employment, Azuara and Marinescu (2013) find no effect of the Mexican *Oportunidades* on informal employment. Gasparini et al. (2009) analyze the Argentinean *Programa Jefes de Hogar* (PJH), implemented after the crisis in 2002, and find that although the initial impact of the program was pro-informality, this bias disappeared as the value of the transfer, fixed in nominal terms, lost purchasing power respect to the formal sector wages. Other papers look at reforms in the health insurance system: Camacho et al. (2009) find a significant increase in informal employment in Colombia after an expansion of the non-contributive public health insurance system, while Bérigolo and Cruces (2013) evaluate a health reform in Uruguay that extends coverage to children of registered workers, identifying a substantial reduction in the labor informality rate.

4. Data and methodology

To carry out this study we use microdata from Argentina's national household survey (*Encuesta Permanente de Hogares*, EPH) conducted by the National Statistical Office (INDEC). The EPH covers 31 large urban areas, which represent 62% of the total country population. The rotation scheme of the EPH allows the construction of short panels that enable monitoring each individual during a period of one year. In this paper we construct six annual panels; each one has one observation in the first half of year t and one observation in the first half of year $t + 1$.¹⁸ These yearly panels cover the period 2005–2011: four of them are prior to the AUH implementation in late 2009, while the other two panels were carried out after the program inception. Each panel has around 45,000 observations (individuals). Since the panels are short, the typical problem of attrition is not important. Given that the EPH does not include questions to identify AUH beneficiaries, we divide the population into two groups according to their potential eligibility to participate in the program based on the official criteria and conditionalities (*intention to treat*). Specifically, the treatment group is composed by unemployed and unregistered workers in the initial period of each panel, aged between 18 and 70 years old, belonging to informal households (*i.e.* households with no registered workers) with children under 18. The question in the EPH used to identify informality asks salaried workers whether they have deductions for pensions in their jobs. This question is used in the literature as the main proxy for informality (Tornaroli et al., 2012), and is close to the eligibility criterion for the AUH: any salaried worker that has pension deductions should be registered in the national social security system, and hence does not qualify for the AUH. Self-employed workers are typically unregistered. Some self-employed workers could in principle be paying social security taxes and receiving a basic social security coverage if their earnings

Table 1

Descriptive statistics. Treatment and control group.

Variables	Treatment (i)	Control (ii)	Diff. (ii) – (i)	t	p-value
Age	36.0	44.4	8.4	27.1	0.00
Male	0.552	0.596	0.044	3.6	0.00
Household head	0.514	0.530	0.016	1.3	0.20
Years of education	7.9	7.9	0.0	0.0	0.96
Hourly wage in main activity	2.3	2.4	0.1	1.1	0.26
Weekly hours of work	29.5	23.4	–6.1	–10.4	0.00
Household per capita income	140.0	163.5	23.5	11.7	0.00
Observations	9380	1930			

Source: Authors' calculation based on first semester data of EPH (2005–2011). Note: means correspond to pre-intervention panels.

are above some threshold, but almost no worker in our sample meets that requirement.

Workers in the control group share the same characteristics as the group of potential participants but they are members of households without children. The presence of children under 18 years old constitutes the crucial variable that determines eligibility for the group of unregistered workers. Since this characteristic is easy to observe and monitor by the authorities of the program, inclusion errors (households without children, but admitted to the program) are expected to be very low. Also, the proportion of eligible households not participating in the program is small, since admission and participation costs are low. According to information from the office in charge of the AUH (ANSES), 80% of all eligible children were receiving the transfer six months after the program inception. The rest includes self-excluded households and future participants that are lagged behind with the program enrollment.

The AUH is a poverty-alleviation program aimed at increasing the well-being of low-income households. However, given the difficulties to observe and monitor income, the program is not targeted to low-income people but to informal and unemployed workers, a feature that allows middle and high-income self-employed workers to participate. In practice, some of them may opt out of the program for reasons related to social responsibility, stigma or others. To focus the analysis on poor people who are potentially participants of the AUH, we restrict the sample to individuals in the first three deciles of the household per capita income distribution, with no formal tertiary education (*i.e.* with complete high school or less education).¹⁹

Table 1 presents some basic descriptive statistics of the treatment and control groups. Although on average they share some characteristics (*e.g.* years of education, hourly wages), there are some significant differences between the two groups. For instance, the control group includes older workers, with fewer hours of work and higher per capita income. Naturally, it is expected that these groups differ in other unobservable characteristics, as well. Having a child depends on several factors that are not surveyed by the EPH, and which in turn may be affecting the labor informality outcomes.

In order to estimate the program impact on the informality status of workers, we use the *difference in differences* methodology (DD), which focuses on the comparison of the differences in the outcome of interest between the treatment and control group, before and after the policy implementation (Card, 1990; Card and Krueger, 1994). This methodology is convenient not only for its simplicity, but also for its potential effectiveness to avoid several endogeneity problems that arise when comparing outcomes for heterogeneous individuals (Bertrand et al., 2004).

The identification assumption in this paper is that in the absence of the AUH program the labor formalization trends for both treatment and control groups would have been similar. Also, it is assumed the inexistence of other events, contemporaneous with the AUH, that could

¹⁸ Since INDEC did not carry out the EPH during the second semester of 2007, we decided to use first semester panels in most of the analysis. Anyway, we also report results using all panels to check the robustness of our main conclusions.

¹⁹ This restriction is based on the fact that 75% of AUH's eligible households belong to this group. In the paper we also report the results for other groups. However, since we cannot identify the actual beneficiaries of the program, as we extend the sample to cover richer deciles, the risk of including potential beneficiaries that opt out of the program increases.

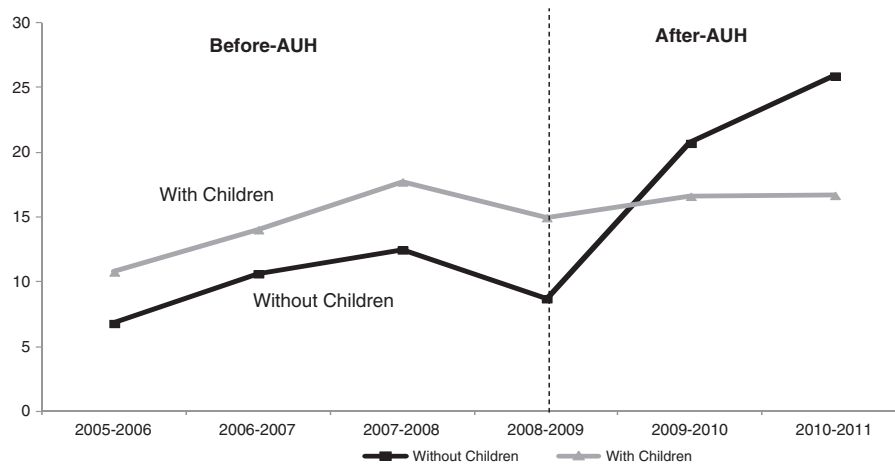


Fig. 1. Proportion of informal workers that become formal. Source: Own calculation based on EPH. Note: The sample is restricted to unemployed and informal workers in the first semester of the initial year of each panel, aged 18–70 years old, in non-formal households, without tertiary education, and belonging to the three poorest deciles of the household per capita income distribution.

have involved a differential impact between groups on labor informality outcomes. This assumption does not seem strong: the literature coincides in stressing that the AUH was almost the only and by far the main social policy innovation in Argentina in the period under analysis (Bertranou, 2010; D'Elia and Navarro, 2012; D'Elia et al. 2010; Groisman et al. 2014; Lustig et al. 2012; Rofman and Oliveri, 2011a, 2011b).²⁰ In fact, the AUH was the consequence of a long political debate on the need to revitalize the social policy in Argentina (Groisman et al. 2014). We include an appendix with a discussion of the poverty-alleviation programs in place in the period under analysis in the paper (see Appendix B).

The following equation provides a standard linear specification of the DD model:

$$F_{it} = \alpha + \beta_1 H_{it} + \beta_2 Post + \gamma(H_{it} \cdot Post) + \theta X_{it} + u_{it} \quad (1)$$

where F_{it} is the relevant outcome, in our case a binary variable indicating whether an informal worker is formalized during the period covered by the panel. The model includes an independent variable H that captures whether the individual belongs to the treatment (with children) or control group (without children), a variable $Post$ that distinguishes post-program periods from those before the policy implementation, an interaction term between them, and a set of individual and household-level controls (X). The control variables include age, age-squared, gender, marital status, educational level, head of household, household size, number of children, firm size, activity sector, geographical region and time (panel) dummies.

Considering only two time periods ($t = 0, 1$), the mean difference between groups (treatment T and control C) of their differences over time is

$$DD = (F_1^T - F_0^T) - (F_1^C - F_0^C). \quad (2)$$

According to this DD linear specification, it is easy to show that

$$DD = \gamma + (u_1^T - u_0^T) - (u_1^C - u_0^C). \quad (3)$$

If the expected value of the last two terms is zero, then DD provides a consistent estimator of the treatment effect. Given that the program assignment is not random, that condition becomes the fundamental assumption of this methodology, which allows causal interpretation of the γ parameter.

²⁰ The second program in terms of coverage, *Argentina Trabaja*, implemented before the AUH, is of little relevance: the number of participants is less than 3% of the number of AUH beneficiaries (households).

The same analysis can be carried out under a nonlinear specification. In that case the conditional expectation of the dependent (binary) variable is a nonlinear function. Analytically,

$$P(F_{it}) = \Phi(\alpha + \beta_1 H_{it} + \beta_2 Post + \gamma(H_{it} \cdot Post) + \theta X_{it}) \quad (4)$$

where P denotes probability. The impact of the program is estimated as

$$DD = \Phi(\alpha + \beta_1 + \beta_2 + \gamma + \theta X_{it}) - \Phi(\alpha + \beta_1 + \beta_2 + \theta X_{it}). \quad (5)$$

The treatment effect will be the incremental probability impact caused by the coefficient of the interaction term (Ai and Norton, 2003; Puhani, 2012). Being $\Phi(\cdot)$ a strictly monotonic nonlinear function, the sign of γ will always coincide with the sign of the treatment effect. These results apply to all nonlinear models with this parametric structure. In particular, in this paper we use a *Probit* model to estimate the causal effect of the treatment (the AUH program) on the probability for informal workers of moving to a formal job.²¹

5. Results

The main result of the paper is illustrated in a non-conditional framework in Fig. 1, which shows for each panel and group (treatment and control) the proportion of unregistered workers who become formal in a given period. This proportion was initially greater for workers with children, presumably as a result of the higher value that social protection benefits has for those who are parents, given that coverage typically extends to the family of the direct beneficiary. Although the level is different, the evolution of the formalization rate is almost identical between the treatment and control groups before the end of 2009.²²

This similarity is broken in 2010, coinciding with the AUH implementation. In the last two panels the pattern clearly differs across groups: while the proportion of informal workers who experienced a transition to formal employment grew strongly in the control group, in coincidence with a period of economic expansion after a short stagnation, that share remained stable among informal workers in the treatment group. While before the implementation of the AUH the

²¹ Angrist and Pischke (2009) find that the estimates from a linear probability model are not far from those obtained with a nonlinear *Probit* model.

²² The visual inspection is confirmed by the result of a test for pre-program parallel trends. We run a model of our outcome of interest (a dummy for the transition to a formal job) on a constant, a treatment dummy (with children), year dummies, and interactions. We then apply an F test in which the null hypothesis (H_0) refers to the joint equality to zero of the coefficients for the interaction terms. We find that there is no enough evidence to reject H_0 before the implementation of the program; $F(3, 9439) = 0.21$, $\text{Prob} > F = 0.8871$; while in contrast H_0 is easily rejected after the program.

Table 2
Formalization rates.
Point estimate and 95% confidence intervals.

	Without children		With children	
	Estimate	Interval	Estimate	Interval
2005–2006	6.8	(4.2, 9.4)	10.8	(9.4, 12.1)
2006–2007	10.6	(7.6, 13.7)	14.0	(12.4, 15.6)
2007–2008	12.5	(9.5, 15.5)	17.7	(16.2, 19.3)
2008–2009	8.7	(5.7, 11.7)	15.0	(13.4, 16.6)
2009–2010	20.7	(16.7, 24.7)	16.6	(15.0, 18.3)
2010–2011	25.9	(21.7, 30.1)	16.6	(14.9, 18.3)

Source: Authors' calculation based on first semester data of EPH (2005–2011).
Formalization rate = share of informal workers who become formal in a given period.

formalization rate of workers with children was significantly higher than the rate for those without children, the situation completely reversed after the program (see Table 2 for confidence intervals).²³

Fig. 1 is useful as a motivation of the main result of the paper, as it suggests that some relevant change in behavior may be taking place after the program, but it falls short as a compelling argument, since it is just a non-conditional graph. The validity of the result should be checked in a more rigorous framework. In the rest of this section we examine whether this result holds in a multivariate regression framework, adding controls, restricting the sample and searching for heterogeneous effects.

Table 3 shows the results of three alternative specifications for the model of the probability of becoming formal: (1) without controls, (2) with controls, and regional and time dummies, and (3) restricting the analysis to informal workers (*i.e.* excluding the unemployed), which allows the introduction of controls for sector of activity.²⁴ The table shows the marginal effects corresponding to each RHS variable. The treatment effect is the marginal effect of the interaction term.

All specifications reveal a significant and negative treatment effect, suggesting the existence of relevant disincentives to participate in the formal labor market as a result of the AUH implementation. These disincentives appear to operate more strongly when restricting the analysis to informal workers, excluding the unemployed. According to the estimates in column (3), the AUH implied a fall of 8.4 percentage points in the probability of experiencing a transition to a formal job. This estimate represents a mean reduction of almost 40% in the probability of formalization, respect to what would have happened in the absence of the program.

5.1. Robustness checks

We carry out several exercises to assess the robustness of the results.²⁵ First, we estimate the model for more homogeneous samples, and find that the main results of the paper hold, although in some cases the small number of observations reduces the significance of the coefficients. Just as an illustration, in column (i) of Table 4 we restrict the sample to workers aged 25–55, while in columns (ii) and (iii) we further restrict the sample to workers with one child and three children, respectively.

²³ The differential patterns in the transitions shown in Fig. 1 are reflected in the levels of labor formality. Before the AUH (from 2006 to 2009) the share of workers with a registered job grew 30% in the control group (from 19.6% to 25.4%) and 62% in the treatment group (from 22.7% to 36.7%). In contrast, after the AUH (2009–2011) that share went up 25% in the control group and just 7% in the treatment group.

²⁴ The control variables include age, age-squared, gender, marital status, educational level, head of household dummy, household size and number of children, as well as controls for differential trends (interactions between treatment group and time dummies). The extended version of this paper presents results for several alternative models. For example, we estimate models that include interactions between the treatment variable and demographic. The results change only marginally in all specifications.

²⁵ All the results refer to variations of model 3 in Table 3, *i.e.* a model of the probability for informal poor workers of becoming formal. We also estimated models of the level of informality, although this is not the main focus of our analysis, since the rate of informality is affected by various other issues and transitions (*i.e.* from inactivity to informality). See Appendix C.

Table 3
Effect of the AUH on the probability of becoming formal.

	(1)	(2)	(3)
With_children*after	−0.0765*** (0.0184)	−0.0695*** (0.0167)	−0.0842*** (0.0187)
With children (H)	0.0385*** (0.0123)	0.0472*** (0.0132)	0.0807*** (0.0184)
After (Post)	0.108*** (0.0276)	0.152*** (0.0229)	0.116*** (0.0446)
With controls, time and regional dummies	No	Yes	Yes
Excluding the unemployed	No	No	Yes
Observations	16,635	16,635	13,777
Pseudo R2	0.005	0.086	0.096

Source: Authors' calculation based on EPH microdata, 2005–2011.

Note 1: The sample is restricted to unemployed and informal workers in the first semester of the initial year of each panel, aged 18–70 years old, in non-formal households, without tertiary education, and belonging to the three poorest deciles of the household per capita income distribution.

Note 2: The dependent variable is equal to 1 if the individual became a formal worker during the period, and 0 otherwise. The control variables include age, age-squared, gender, marital status, educational level, head of household, household size, number of children, activity sector, geographical region, time dummies, as well as controls for differential trends (interactions between time dummies and treatment). Clustered robust standard errors in brackets.

* Significant at 10%.

** Significant at 5%.

*** Significant at 1%.

Second, we replicate our benchmark exercise applying standard propensity score matching techniques. In this case the control group is formed by informal workers without children, and with similar probability of participation according to a set of observable demographic, educational and labor characteristics. The coefficients in column (iv) suggest that the result of a substantial disincentive to formalization introduced by the program holds. When restricting the matching to workers of the same age and number of children, the results also hold, despite the number of observations strongly falls (not shown in the table).

Third, we exploit the discontinuity of eligibility by looking at those workers with children in a band around 18 years old. We divide the sample according to the age of the youngest child: those with children between 16 and 18, and those with children between 19 and 21. In principle, the results from this restricted subsample should be more convincing, given the similarity between treatment and control groups; however, the reduced number of observations makes the results less robust.²⁶ While formalization rates increased from 21.3% (mean before the program) to 27.1% (mean after the program) for the control group, it actually went down from 20.6% to 18.5% for the treatment group. Column (v) documents this fact in a difference-in-discontinuity framework. The results are consistent with the main findings of the paper: formalization rates are reduced for those workers with children between 16 and 18 years old after the implementation of the program, compared to those with children between 19 and 21 years old. The results however are not strongly significant, likely due to the small number of observations, and to the fact that the disincentives to formalization for a worker weakens as her/his children approach the threshold age of 18.

For the reasons commented above we prefer to work with the panels that include information for the first half of each year. Column (vi) suggests that the results hold when expanding the sample to include data for the second semester.

Although naturally the specific coefficients of the treatment effect are different across models in Table 4, in all cases the size of the impact seems large: the estimates represent a mean reduction of between 28% and 43% in the probability of formalization, respect to what would have happened in the absence of the program. In the following section we elaborate more on this point in the framework of the existing literature.

²⁶ In fact, the size of the survey precludes us to use a narrower definition around age 18.

Table 4
Effect of the AUH on the probability of becoming formal.
Robustness checks.

	Restricted sample: age (25–55)						False experiments: intervention in	
	All	1 child	3 children	Matching	Discontinuity	Using also Semester 2	2007	2008
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
With_children*after	−0.0717*** (0.0259)	−0.0712** (0.0363)	−0.0750** (0.0294)	−0.0806** (0.0351)	−0.0650* (0.0343)	−0.0877*** (0.0200)	0.0104 (0.0267)	0.00608 (0.0433)
With children (H)	0.0827*** (0.0189)	0.0402 (0.0432)	0.0742*** (0.0262)	0.0599* (0.0329)	−0.0139 (0.0287)	0.0765*** (0.0175)	0.0246* (0.0129)	0.0597* (0.0328)
After (Post)	0.113** (0.0531)	0.117* (0.0610)	0.119** (0.0577)	0.123** (0.0573)	0.0856* (0.0474)	0.118*** (0.0420)	0.0645*** (0.0243)	0.00222 (0.0399)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,057	3258	7738	5584	1732	22,995	6992	9094
Pseudo R2	0.100	0.121	0.104	0.115	0.128	0.088	0.1155	0.102

Source and notes: see Table 3. All the results correspond to model 3 in that table. Clustered robust standard errors in brackets. The controls used in the matching column (iv) are age, age squared, gender, household head dummy, marital status, education, income, labor status and regional dummies. In column (v) we restrict the sample to workers with children aged 16 to 21, and divide the sample into those eligible (16 to 18) and those non-eligible (19 to 21).

* Significant at 10%.

** Significant at 5%.

*** Significant at 1%.

To contribute to the assessment of the likelihood of our identification assumption, we run a false experiment or *placebo*, in which we evaluate the program impact as if the policy would have been implemented prior to the date in which it was actually carried out. Column (vii) in Table 4 presents the estimates from simulating the AUH implementation in 2007, while column (viii) proposes a similar experiment but as if the program would have started in 2008. We find that the effects are not significantly different from zero in the two cases, which reinforces the validity of the identification assumption.

5.2. Discussion

The strong increase in formalization rates observed for our control group (without children) in the period after the implementation of the program may raise some concerns about the identification strategy (see Fig. 1). Although we cannot rule out the possibility, we argue that this increase is not related to the implementation of the AUH, but instead to the recovery of the economy after a short dip in 2009.

After the big crisis of 2001–2002 the Argentina's economy strongly recovered, showing high and stable growth rates (see Fig. A in Appendix A). The average growth rate in real GDP per capita for the three years before the AUH intervention (the years that are included in the paper) was 6.8%. After the big crash of the early 2000s, labor markets also strongly recovered. Formalization rates started to speed up after the crisis fueled by the market recovery, and also by efforts by the government to sustain the process of labor formalization. All this shows up in Fig. 1: formalization rates go up from 2005 to 2008 for both groups (with and without children). The Argentina's economy underwent a short crisis in 2009 when real per capita GDP decreased 0.3%. Understandably, the process of increasing formalization substantially reduced its speed during that year of economic stagnation.²⁷ The economy strongly recovered in 2010. In fact, the growth rate in that year was 7.9%, *i.e.* higher than in the years previous to the 2009 crisis. It is likely that in that context and after a short break, the process of increasing formalization continued. Moreover, it is likely that during 2010 firms formalized workers that would have been formalized in 2009 under normal circumstances

²⁷ In contrast, the crisis did not have a big impact on unemployment and poverty (see Fig. A). It was probably optimal for the firms (and more acceptable for the government and the trade unions) to avoid layoffs if the crisis was expected to be short, and instead reduce costs by delaying the formalization of new workers until the crisis was overcome. Some authors have argued that in developing countries firms may adjust labor benefits among their workers as a cost-minimizing mechanism, alternative to wages and employment (Galiani and Weinschelbaum, 2012; Viollaz, 2014).

but they were not due to the crisis, a behavior that should have increased further the formalization rates of 2010.²⁸

In summary, we believe that the large increase in formalization rates in 2010 for the control group is not unexpectedly high, given the context of a strong recovery after a short crisis within a process of economic growth and increasingly stronger labor markets. In that light, we interpret our results in Tables 3 and 4 as suggesting that the new social program prevented formalization rates in the treatment group to strongly increase, as we would expect given the economic conditions, and as we observe in the control group.

The size of the disincentive effect that we find is large: as reported above, our estimates represent a mean reduction of between 28% and 43% in the probability of formalization for the treatment group. We argue that the large size of the cash benefit may account for such a sizeable effect: for a typical poor informal worker with three children the transfer represents more than 25% of his/her expected wage in the formal sector. It is not surprising that the introduction of this large new factor affected the outcome of many decisions and labor negotiations.

It is difficult to put our quantitative results in perspective, as there are very few papers that analyze potential disincentives to labor formality of cash transfer programs in Latin America (Bosch and Manacorda, 2012). Amarante et al. (2011) analyze the Uruguayan cash transfer program PANES with a regression discontinuity estimator. Although they focus on the effect on earnings, they also report a large negative effect of program participation on employment in the formal sector. Gonzalez-Rozada and Pinto (2011) find that in Ecuador mothers receiving *Bono de Desarrollo Social* benefits have a probability of leaving formal employment 12 points higher than the comparable group not receiving those benefits. Gasparini et al. (2009) find an initial fall of 3.4 points in the probability of formalization after the implementation of PJH, a poverty-alleviation program in Argentina. That effect is lower than what we find for the AUH, which is consistent with the fact that PJH was a smaller program implemented in a scenario of very weak labor markets. Using household survey data Azuara and Marinescu (2013) do not find significant effects in Mexico neither from the *Oportunidades* cash transfer program nor from the noncontributory insurance scheme *Seguro Popular*. However, using social security data Bosch and Campos-Vázquez (2010)

²⁸ Consider a simple exercise to illustrate this point: we compute the rate of increase in formalization prior to the 2009 crisis, and assume that that rate continued to apply in the following years. In that simulation the formalization rate would have been 18.7% in 2010 for the control group. The rate in 2010 was in fact 20.7%, not far from the forecast (especially after considering the higher rates of economic growth in 2010).

Table 5
Effect of the AUH on the probability of becoming formal.
Heterogeneity effects.

	Initial labor status (informal)			Gender		Number of children		Income group: poorest		
	Self-employed (i)	Salaried (ii)	Unemployed (iii)	Women (iv)	Men (v)	≤5 (vi)	>5 (vii)	20% (viii)	40% (ix)	100% (x)
With_children*after	−0.115*** (0.0357)	−0.0609** (0.0279)	−0.0468* (0.0266)	−0.0515** (0.0227)	−0.101*** (0.0287)	−0.0774*** (0.0237)	−0.101*** (0.0262)	−0.118*** (0.0262)	−0.0562** (0.0259)	−0.0146 (0.0236)
With children (H)	0.0741** (0.0318)	0.0498*** (0.0163)	0.0118 (0.0162)	0.0173 (0.0122)	0.0948*** (0.0287)	0.0256 (0.0169)	−0.0221 (0.0300)	0.0672*** (0.0151)	0.0395*** (0.0148)	0.0284 (0.0208)
After (Post)	0.0950** (0.0457)	0.110* (0.0563)	−0.0162 (0.0348)	0.0893* (0.0479)	0.118*** (0.0408)	0.107*** (0.0400)	0.108*** (0.0397)	0.153*** (0.0510)	0.0472* (0.0274)	0.0121 (0.0198)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4350	9443	2842	6000	7777	13,025	2963	10,045	16,651	23,358
Pseudo R2	0.109	0.091	0.075	0.079	0.054	0.092	0.109	0.100	0.091	0.071

Source and notes: see Table 3.

* Significant at 10%.

** Significant at 5%.

*** Significant at 1%.

argue that the effects are mainly found in small municipalities which are grossly underrepresented in the Mexican household survey.

Other studies are focused on the effect of health reforms, and then the results are not directly comparable. Camacho et al. (2009) find that an expansion in the non-contributory health insurance system in Colombia implied an increase in informality levels between 2 and 5 percentage points; while Bérigolo and Cruces (2013) report a 1.3 points fall in informality after an extension of the health insurance to children of formal workers. In Mexico, Bosch and Campos-Vázquez (2010) and Aterido et al. (2011) find that *Seguro Popular* tends to boost informal employment at the expense of formal employment, while as reported above, Azuara and Marinescu (2013) find no effect.

These studies significantly differ along a number of dimensions, including the type of intervention (health insurance or CCT), the informality definition, the treatment of the self-employed, the reference population (working age population or total formal employment), the strategy of identification, the type of data used (household surveys or administrative data, panel or cross-section data), and the focus of the analysis (levels or transitions to formality),²⁹ and hence the comparison of the size of the reported effects across studies is very problematic.

On top of that, the size of the analyzed interventions is also very different. In fact, the per child benefit provided by the AUH is among the highest in Latin America (with Ecuador and Panama) according to several indicators (Stampini and Tornaroli, 2013).³⁰ It should also be stressed that unlike our paper most studies do not focus on the poor informal workers, but on the general impact of the program, which probably tends to reduce the magnitude of the reported effects.

5.3. Heterogeneous effects

The informality bias of the AUH program is significant for the three relevant labor categories – the self-employed, salaried informal workers, and the unemployed – which confirms the expected result from the discussion in Section 3 (see Table 5). The impact seems stronger for the group of self-employed. Also, the disincentives are significant both for females and males. The fall in the probability of formalization driven by the AUH is 5.2 points for women and 10.1 points for men; however, these values represent a larger proportional decrease for women (45%) than for men (30%) respect of what would have happened without the program. If there are economies of scale in household consumption, then a

²⁹ In Appendix C we estimate the impact of the AUH on the level of informality rather than on transitions from informal to formal jobs. We find a positive effect of around 3 percentage points, which lies within the bounds found in the literature (Bosch and Manacorda, 2012).

³⁰ In particular, it is substantially higher and more extended that the benefit from *Oportunidades* in Mexico, which could explain part of the difference between our results and the absence of effect in Azuara and Marinescu (2013).

fixed transfer per child, such as in the AUH, would imply a higher benefit in large families, and hence a potential stronger effect on behavior. We find that the disincentive towards formality is significantly higher for those workers who live in large families. However, the difference may be also due to larger households being poorer than the rest.

Although the results are qualitatively similar when the sample is restricted alternatively to the 20% or 40% poorest of the population in terms of household per capita income (columns (viii) and (ix)), the effects are stronger for the narrow group, presumably due to at least two reasons: first, the proportional impact of the AUH cash transfer is higher for the poorest participants, so the effects discussed above are potentially stronger; and second, when the sample is expanded to higher income groups the probability of including eligible households that opt out of the program increases. In fact, when considering the whole population the coefficient remains negative, but becomes non-significant (column (x)).

In Table 6 we evaluate the program impact dividing workers according to the age of the youngest child. We expect the impact to be larger for those parents with younger children who could benefit from the program for a longer period of time. In accordance with this expectation we find stronger disincentives to formalization for workers with younger children.³¹ The AUH provides a four times greater cash transfer to those workers with a disabled child. The results of the last column in Table 6 suggest that the disincentives to formalization are strong in this group of workers.

5.4. Primary and secondary workers

Non-contributive transfers, such as AUH, may induce strategic behavior within the household (Bérigolo and Cruces, 2013; Galiani and Weinschelbaum, 2012). If a worker holds a formal job, his/her family will be protected against some risks, which reduces the incentives to formalization of the rest of the household members. In fact, Latin American secondary workers are less likely to operate in the formal economy than primary workers, *ceteris paribus*. Galiani and Weinschelbaum (2012) find that the increased labor force participation of secondary workers in Latin America explains much of the surge in the labor informality rate in the region.

Following the standard practice, we identify the (self-declared) household head as the primary worker in the household and the remaining employed individuals as secondary workers. While the results in the first panel of Table 7 suggest that the impact of the program is significant for both groups, the second panel reveals an interesting fact: the disincentive to participate in the formal sector driven by the AUH is relevant for those secondary workers whose household head remains informal, but disappears for those whose primary worker becomes formal in the period. If the primary worker gets a formal job, his/her family is discontinued

³¹ Although the pattern of the impact is clearly decreasing in the children age, some differences between coefficients are likely not statistically significant.

Table 6

Effect of the AUH on the probability of becoming formal.
Groups according to age of youngest child.

	Age of youngest child				
	0–5	6–10	11–14	15–17	Disabled
With_children*after	–0.0864*** (0.0246)	–0.0694*** (0.0250)	–0.0656** (0.0318)	–0.0556* (0.0325)	–0.0817** (0.0329)
With children (H)	0.0532** (0.0220)	0.0556** (0.0280)	0.0496 (0.0603)	0.0323 (0.0596)	0.0193 (0.0313)
After (Post)	0.0862** (0.0351)	0.118*** (0.0383)	0.150*** (0.0538)	0.0849** (0.0371)	0.127*** (0.0410)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	8159	4843	3661	3037	2921
Pseudo R2	0.1006	0.1154	0.1021	0.1327	0.1059

Source and notes: see Table 3.

* Significant at 10%.

** Significant at 5%.

*** Significant at 1%.

from the AUH benefits, and then the employment decision of the secondary members becomes irrelevant in terms of access to the program. In contrast, if the primary worker continues to be unregistered, the disincentives towards formalization remain relevant for the rest of the workers in the household. Although the results are suggestive, they are not conclusive, since the number of informal secondary workers in households where the head became formal in the period is small.

5.5. Incentive towards labor informality

So far we have showed that the AUH implied some disincentives for unregistered workers to become formalized. But, is the program also encouraging formal workers to become informal? Table 8 shows the outcomes of models where the binary dependent variable is equal to 1 when a formal worker experiences a transition to informality in a given year. In all cases the potential informality incentives driven by the program are not statistically significant. This result suggests an asymmetry in the reaction of formal and informal workers, which could be explained by adjustment and transaction costs under uncertainty. For instance, if the introduction of the AUH implies that for some formal workers self-employment becomes a better option, it is likely that the switch materializes only in the medium run, when the benefits and costs of this labor transition have been clearly evaluated. Similarly, if with the inception of the AUH the new bargaining equilibrium between firms and employees implies lower formality rates, that outcome would probably take place only after long negotiations.

Table 7

Effect of the AUH on the probability of becoming formal.
Primary and Secondary workers.

	Type of worker		Secondary worker	
	Primary (i)	Secondary (ii)	Informal primary worker (iii)	Formal primary worker (iv)
With_children*after	–0.0995** (0.0390)	–0.0603** (0.0259)	–0.0473* (0.0278)	–0.0395 (0.0605)
With children (H)	0.0917*** (0.0191)	0.0178 (0.0215)	0.0223 (0.0202)	–0.164 (0.145)
After (Post)	0.159** (0.0634)	0.0502* (0.0294)	0.0384 (0.0269)	–0.0208 (0.0821)
Controls	Yes	Yes	Yes	Yes
Observations	7494	6283	5732	542
Pseudo R2	0.091	0.093	0.101	0.221

Source and notes: see Table 3.

Column (iii) = Sample of informal secondary workers in households where the head remained informal during the period. Column (iv) = Sample of informal secondary workers in households where the head became formal during the period.

* Significant at 10%.

** Significant at 5%.

*** Significant at 1%.

6. Concluding remarks

In this paper we assess the impact on labor informality of a conditional cash transfer program implemented in Argentina in 2009, that delivers cash benefits to unregistered workers. For this purpose, and given the program design and the non-random assignment of the beneficiaries, we use a non-experimental methodology of double differences and identify the potential participants according to the criteria and conditionalities of the program. The evidence suggests the existence of statistically significant and economically relevant disincentives to labor formality driven by the program. These effects apply to self-employed workers, informal salaried employees and the unemployed, and are particularly strong for poor workers in large households and with children of young age. Disincentives towards formalization disappear in secondary workers whose household's head becomes formalized. On the other hand, the program does not seem to have encouraged registered workers to become informal.

Throughout Latin America non-contributive social protection schemes have been greatly expanded, with remarkable achievements in terms of reducing poverty and inequality. However, the evidence also suggests that these social programs may generate some undesirable results in the labor market. This downside by no means implies abandoning the initiatives to promote the extension of social protection coverage, but instead it highlights the need to discuss and evaluate costs and benefits of alternative schemes.

Table 8

Effect of the AUH on the probability of becoming informal.

	Poorest 30%	Poorest 20%	Poorest 40%
With_children*after	0.0707 (0.0522)	0.0394 (0.0716)	–0.0268 (0.0279)
With children (H)	–0.0178 (0.0270)	–0.0167 (0.0563)	–0.0298 (0.0299)
After (Post)	–0.104* (0.0595)	–0.0937 (0.0638)	–0.0120 (0.0343)
Controls	Yes	Yes	Yes
Observations	4883	2261	8011
Pseudo R2	0.041	0.054	0.032

Source: Authors' calculation based on EPH microdata, 2005–2011.

Note 1: The sample is restricted to formal workers in the first semester of the base year of each panel, aged 18–70 years old.

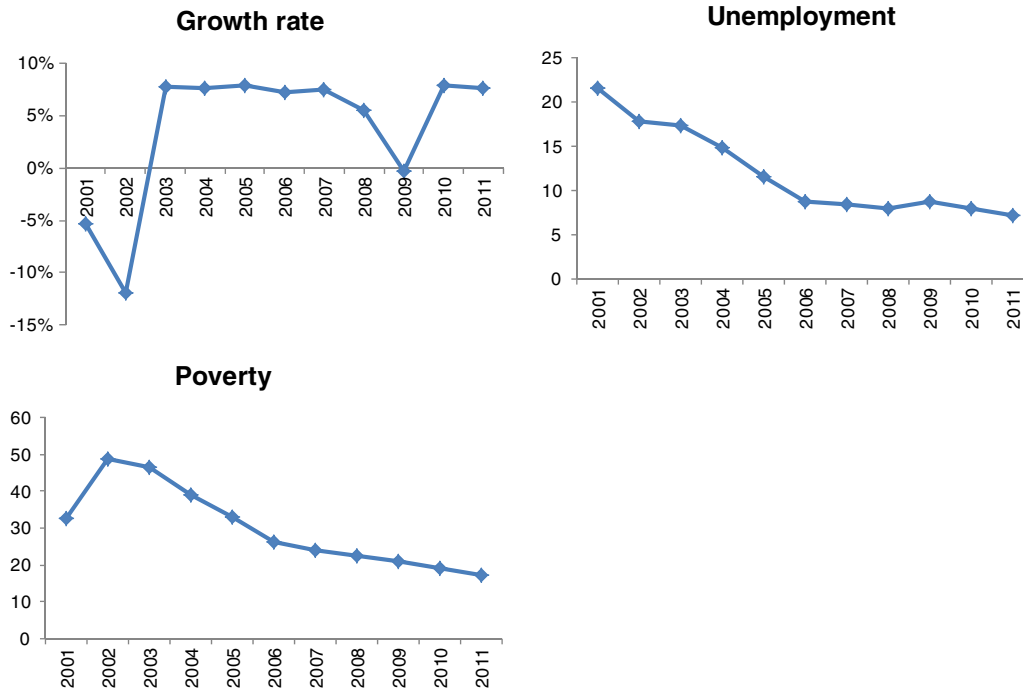
Note 2: The dependent variable is equal to 1 if a formal worker became informal in the period and 0 otherwise. The control variables includes age, age-squared, gender, marital status, educational level, head of household, household size, number of children, firm size, economic sector, geographical region and time dummies. Clustered robust standard errors in brackets.

* Significant at 10%.

** Significant at 5%.

*** Significant at 1%.

Appendix A



Source: growth rate in real per capita GDP (constant prices) from WDI; unemployment rate from INDEC, and poverty headcount ratio (official moderate poverty line) from CEDLAS.

Fig. A. Per capita GDP growth rates, unemployment rate and poverty headcount ratio. Source: growth rate in real per capita GDP (constant prices) from WDI; unemployment rate from INDEC, and poverty headcount ratio (official moderate poverty line) from CEDLAS.

Appendix B. Social programs in Argentina

This appendix documents changes in social programs that may have affected our target population (poor informal households with children) in the period under analysis (2005–2011).

Triggered by a deep socioeconomic emergency Argentina launched a workfare program in 2002. The program *Jefes y Jefas de Hogar Desocupados* (PJH) delivered a payment of \$150 per household to unemployed household heads with children aged less than 18. While the program started with around 2 million beneficiaries, in 2005 the PJH covered 1.5 million households. The real value of the benefit substantially fell over time given that the transfer was fixed in nominal terms (the fall was 20% between 2002 and 2005). In 2006 most of the beneficiaries of PJH were assigned to two new programs (*Familias* and *Seguro*, see below). By 2007 the number of PJH participants had fallen to 750,000. Around 450,000 beneficiaries remained in 2009, when the program was phased out. By that time the real value of the transfer had fallen more than 60% from the initial value in 2002. Spending on the program started in around 1 GDP point, and decreased to 0.03 points in 2009.³²

The Program *Familias* (*Familias para la Inclusion Social*) was a conditional cash transfer (CCT) launched in 2006 that absorbed most of the PJH beneficiaries: the admission to the program was mostly restricted to former PJH beneficiaries with less than complete secondary education and with two or more children younger than 19. The program provided a monthly payment of \$155 with one child and \$30 more for each additional child (up to six children). With the inception of AUH in 2009 the *Familias* program was phased-out, as beneficiaries moved to the

new (more generous) program. According to official records the number of *Familias* beneficiaries in 2009, before the creation of AUH, was less than 700,000, and spending on the program was just 0.05 GDP points.

Most of the rest of the former PJH beneficiaries without the requirements to apply for *Familias* (only one child or complete secondary education) were transferred to program *Seguro* in 2006, which provided a similar cash transfer and some labor training, but was limited to two years, in contrast with *Familias* where there was no time limit to the reception of the benefit. The program was almost inexistent in 2009 when the AUH was implemented.

The only poverty-alleviation program that survived after the implementation of AUH was *Argentina Trabaja*, a workfare program implemented in 2009, before the AUH. The program is targeted to specific vulnerable areas and have few conditionalities, including being an unregistered worker (with or without children). The number of participants was less than 70,000 in the period 2009–2011.

In summary, between 2005 and 2009 there were some CCTs (PJH, *Familias* and *Seguro*), which were phased out after the implementation of the much bigger AUH program. The only program that co-existed with AUH was *Argentina Trabaja*, a much smaller workfare program.³³ The number of beneficiaries of poverty-alleviation programs jumped at the end of 2009 after the AUH inception from around 1.2 million to 3.6 million, while the mean value of the per child transfer was almost doubled. Given this situation we interpret the results of the paper as mainly the effect of a large expansion in the social protection system

³² Galasso and Ravallion (2003) and Gasparini et al. (2009) discuss the impact of PJH on various labor outcomes.

³³ The Argentina's social protection system includes other programs, such as unemployment insurance and non-contributory pensions which are not focused on informal workers with children (and in addition they did not experience transformations around 2009), and then are much less relevant for our paper.

in Argentina generated by the inception of the AUH program at the end of 2009.

Appendix C. Level of informality

Our paper is aimed at assessing the impact of a cash transfer program on the *transitions* from informal to formal jobs by exploiting panel data. However, since much of the literature analyzes informality levels, it may also be informative to present the results of models for the level of informality, keeping in mind that levels are affected by various other phenomena and other transitions that we do not consider in the paper (e.g. from inactivity to informality).

In a model for the level of informality the coefficient of the treatment variable (*with_children*after*) is positive and significant (although only at 10% significance level). This piece of evidence suggests that the inception of the AUH program may have implied an increase in the level of labor informality. The size of the increase – around 3 percentage points – is within the bounds found in the literature (Bosch and Manacorda, 2012).

Effect of the AUH on the level of informality.

	(1)	(2)
With_children*after	0.0361* (0.0211)	0.0284* (0.0155)
With children (H)	-0.132*** (0.0155)	-0.0957*** (0.0119)
After (post)	-0.110*** (0.0226)	-0.0547** (0.0234)
With controls	No	Yes
Observations	21,729	21,729
Pseudo R2	0.015	0.133

Source and notes: see Table 3.

Appendix D. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.jdeveco.2015.02.004>.

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