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CENTRO STUDI LUCA D'AGLIANO
DEVELOPMENT STUDIES WORKING PAPERS

N. 433

January 2018

Do Cash Transfers Trigger Investments? Evidence for Peru

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ISSN 2282-5452

Do Cash Transfers trigger Investments?
Evidence for Peru

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Abstract

This paper provides an impact evaluation of the Juntos programme on households' decisions to invest in livestock and agricultural and non-agricultural assets used for income generating activities. Using Propensity Score Matching and Difference in Difference techniques, we show: i) that beneficiaries are significantly more likely to invest in productive assets and activities with respect to non-beneficiaries; ii) that Juntos is more likely to relax liquidity constraints rather than to be used as an insurance for risky investments; iii) that the programs benefits the poor but not the poorest of the poor. Duration and transfers regularity do not produce significant differences between groups of beneficiaries. However, results show a sustained impact of the programme over time. (JEL I38, H20, O12, H43)

Keywords: conditional cash transfers; impact evaluation; households investments; Juntos.

"*Quiero que me cuente, un poco más, ¿en qué gastaba su dinero antes de que entrara al Programa JUNTOS y ahora en qué lo gasta? Antes del Programa, teníamos platita que nos alcanzaba solamente para comer, no había para otra cosa. Ahora, cuando cobramos el Programa JUNTOS, tenemos plata para los útiles. El dinero que nosotros ganamos de los trabajos que hacemos sirve para ahorrar y para comprar algunas otras cosas*." (Beneficiaria de Kuchoquesera). "*Estamos guardando parte del dinero del Programa JUNTOS para trabajar después con eso en cualquier negocio, venta de cachipa, en cualquier cosa que perdura.*" (Beneficiario de Chacolla). (Arroyo, 2010)

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Acknowledgement: We have benefited from comments by Guillermo Perry Rubio, participants from the SITES 2017 Conference, and participants from the UCL Student Work in Progress Seminar. The opinions expressed in this document are those of the authors alone.

*The data used in this publication come from Young Lives, a 15-year study of the changing nature of childhood poverty in Ethiopia, India, Peru and Vietnam (*www.younglives.org.uk*). Young Lives is funded by UK aid from the Department for International Development (DFID). The views expressed here are those of the author(s). They are not necessarily those of Young Lives, the University of Oxford, DFID or other funders.*

1. Introduction

In the past five years, the number of social assistance programmes in developing countries has almost doubled with every country having at least one social assistance programme in place (Gentilini et al. 2014). When implemented in a sound macroeconomic environment, social assistance programmes, and, in particular, cash transfers, are important instruments for reducing hunger and income poverty and breaking the poverty trap (Hagen-Zanker et al. 2011). In the past, social assistance programmes were seen as a mere emergency relief for dealing with climatic shocks, famines and conflicts; more recently their long-term impact on productivity and living standards has been increasingly recognized.

The economic rationale for cash transfers was first identified by Fizbein et al. (2009): cash transfers (hereafter CTs) may reach the poor, reduce poverty and redistribute more with respect to other forms of untargeted public expenditure. Moreover, in case of imperfect credit markets, CTs may allow also credit-constrained households to efficiently allocate the capital within the economy. Finally, CTs, in case of income fluctuation and imperfect insurance markets, may support households in smoothing consumption. The main objective of unconditional CTs is to reduce poverty and vulnerability, while conditional cash transfers (hereafter CCTs) are designed to affect also health and education outcomes. However, beside the intended impacts, CTs may produce several unintended effects such as, for instance, changes in households' investment decision.

Liquidity constraints, imperfect credit markets and households risk aversion are among the main reasons that lead households not to invest in productive activities and to opt for less risky and low-return activities. Cash transfers increase the household income relaxing liquidity constraints and (when regular and predictable) support households in investing in risky but high-return activities. The idea is that beneficiaries use the transfer for immediate consumption and to pay the transaction costs the household incurred in to get the transfer. In the case of conditional cash transfer, a fraction of the transfer may be devoted also to activities required by the programme. Then, the remaining amount (after immediate consumption, transaction costs, and activities related to the programme, if any) can be used for saving or as a collateral to borrow.

CTs are not meant to cover the individual for the whole life cycle and often they have a limited duration. Hence, households may decide to invest the amount they manage to save in productive assets and activities. The investment in productive assets is one of the channels through which beneficiaries can maintain the living standards reached thanks to the programme also after its termination. Even though assets accumulation may come at the expenses of current consumption, it

can represent an intertemporal defensive strategy for poor households since assets accumulation may act as an insurance for future consumption in case of bad economic conditions.

We investigate whether the Peruvian programme, Juntos, has an impact on households' investment in productive assets and activities. More precisely, we analyse the programme impact on agricultural and non-agricultural assets (used by the household for income-generating activities) and on livestock. Moreover, we inquire whether specific programme design and implementation features, such as programme duration and regularity of payment, produce different effects on investments.

The objective of this paper is to produce an impact evaluation of the Juntos programme in Peru and contribute to the empirical evidence about the productive role of cash transfer programmes. To our knowledge, the only impact evaluation about the productive role of Juntos was produced by Del Pozo and Guzmán (2011) who focus mainly on land and livestock ownership. Our focus, on the other hand, is on agricultural and non-agricultural assets used specifically for income generating activities.

This topic is relevant because in developing countries, governments still face several constraints to finance, design and implement social assistance programmes and these interventions are designed to have a limited duration for beneficiaries. Identifying the determinants that may influence impact on investments and on living standards is crucial to properly design interventions and to maximize their long-term impact on the targeted population.

The remainder of this paper is organized as follows: Section 2 reviews the existing literature about the productive impact of cash transfer programmes in developing countries; Section 3 describes the Juntos programme in Peru; Section 4 describes the data; Section 5 presents the empirical analysis and shows the descriptive statistics, the identification strategy and the methods; Section 6 shows and discuss the results; Section 7 presents robustness checks; Section 8 concludes.

2. Literature Review

The interest on the impact of social transfers on productive assets and activities is recent but several studies have already addressed the issue of under which conditions cash transfer affect households' investment decisions. According to a recent literature review (Bastagli et al. 2016), most of the studies on the impact of cash transfers on livestock and agricultural asset ownership show positive and significant effects. Conversely, the evidence on non-agricultural assets impact is still mixed.

The effect of unconditional cash transfers on livestock ownership in several Sub-Saharan African countries is positive and significant (Covarrubias et al. 2012; Daidone et al. 2014a; Blattman et al. 2014; Evans et al. 2014; Asfaw et al. 2014), also in case of environmental shocks (Merttens et al. 2013), but there is not a clear-cut evidence on the impact of unconditional cash transfer on agricultural and non-agricultural assets ownership.

According Daidone et al. (2014b), in Lesotho cash transfers have a negative effect on non-agricultural assets ownership; Asfaw et al. (2014) and Blattman et al. (2012) find the opposite for Kenya and Uganda. An explanation for these differences could be due to the programme design, since the Ugandan programme was specifically designed to invite beneficiaries to invest in income generating activities.

The existing empirical evidence on households ownership of agricultural assets is mixed. According to Berhane et al. (2011), Covarrubias et al. (2012), and Daidone et al. (2014a) in a number of Sub-Saharan African countries, agricultural assets are positively and significantly affected by unconditional cash transfers; while according to Pellerano et al. (2014), Merttens et al. (2013), and Gilligan et al. (2009) in other countries this was not the case. Merttens et al. (2013) explained the absence of an impact with the lack of arable land in targeted HSNP Kenya districts, while Pellerano et al. (2014) argued that the lack on an impact in Lesotho was due to the fact that the programme explicitly suggests spending money for children even though the transfer was unconditional. However, there is not experimental evidence about the fact that conditionalities or messages associated to the transfer may produce different effect on households' investments with respect to traditional unconditional cash transfers. For instance, in Latin America most of the cash transfers are conditional on requirements related to health and education and this leads beneficiaries to allocate part of the transfer to comply with them. Nevertheless, also in these cases, programmes allow beneficiary households to invest in livestock (Todd et al. 2010; Gertler et al. 2012; Veras Soares et al. 2010; Del Pozo and Guzmán 2011). Also in Latin America the impact of cash transfers on non- agricultural assets is mixed. Gertler et al. (2012) find a positive and significant impact on non-agricultural assets used for micro-enterprise activities. Conversely, Maluccio (2010) finds a negative impact of conditional cash transfer in Nicaragua and justify it with the fact that in rural areas, where the programme operates, there are poor infrastructure and such micro-enterprise activities produce too low marginal returns. However, Maluccio (2010) did not find programme effect for beneficiaries on other assets either and explained this finding maintaining that the marginal propensity to consumption was close to one, so that people tend to use the whole transfer for current consumption.

Several authors analyzed agricultural and non-agricultural assets specifically used to generate income. In these cases the studies analyzed not only the mere asset ownership but also the fact that thanks to those assets households starts (or improve) new (or existing) micro-enterprise or farm activities. According to Sadoulet et al. (2001), cash transfers may generate multiplier effects on income to the extent that they are used to invest in existing productive activities that otherwise would not be improved because of credit constraints. In some case beneficiaries, with access to both social protection and other complementary packages of agricultural support, are not only more likely to borrow for productive purposes and to use improved agricultural technologies, but also to invest in their own business activities (Gilligan et al. 2009).

Looking at the current literature, the mixed evidence does not seem not to be justified by the presence of conditionalities or messages associated to the programme: also conditional cash transfers (in Latin America) show a positive impact in several cases. The issue seems to be more related to the amount of money left from current consumption that the household can save, therefore can depend on the transfer size. As reported by FAO (2015), different outcomes across programmes in Sub-Saharan Africa can be explained by differences in the amount. Also Haushofer and Shapiro (2013) show that beneficiaries who receive a larger transfer tends to have higher savings and livestock ownership.

Other programme features may affect the productive role of an intervention. The duration a beneficiary is exposed to the programme (see Gertler et al. 2012) and the presence of complementary interventions (see Blattman et al. 2014) may affect households' investments and in turn long-term living standards. Additionally, households' responses to social transfers may be differently affected by past, current or expected future transfers, thus the transfer time profile is an important factor to be considered (Blattman et al. 2013; Bianchi and Bobba 2012). Finally, according to some research there is heterogeneity in the effect of cash transfers on households' investment choices also according to gender (Covarrubias et al. 2012; Evans et al. 2014).

2. The Juntos Programme

Juntos is a Conditional Cash Transfer (CCT) programme implemented in 2005 by the Government of Peru. The general objectives of the programme are to reduce poverty both in the short and long-run respectively through the injection of liquidity to poor households (via cash transfers) and the improvement of education and health status (through the conditionalities attached to cash transfers) (Perova and Vakis 2009).

The targeting of Juntos has three steps. First, a geographical targeting selects districts according to: exposure to violence; poverty level, measured as a proportion of population with unsatisfied basic needs; poverty gap; level of child malnutrition; and presence of extreme income poverty (Perova and Vakis 2009). Second, a proxy means test (PMT) identifies poor households and is combined with a categorical targeting selecting only households with pregnant women or children aged less than 14[2]. Third, a community-based targeting helps refining the list produced by the PMT strategy.

In order to receive the transfer, households are required to comply with specific conditionalities such as: at least 85% school attendance during the school year for children in school age and regular health check-up for children under 5 and pregnant women (Perova and Vakis 2009; Alcázar y Espinoza 2014). According to the official data reported by the Juntos Team (2017) in the first two months of 2017, 97.3% of targeted households complied with the required conditionalities at least in one of the two months.

The transfer amount is 100 Peruvian Nuevos Soles (around 30 USD) which, in 2009, represented 13% of the total monthly household consumption (Perova and Vakis 2009). The transfer is delivered monthly through bank deposits or with armored van. Even though the transfer is addressed to the household, the person entitled to collect the benefits are women. It is worth noting that the transfer promotes also some accompanying measures, namely beneficiaries' participation in awareness seminars on nutrition, family practices, health, sanitation, literacy, and productive activities.

The geographical coverage of the programme changed over the years. In 2005 only 4 departments (out of the 24 departments in Peru) were covered, while in 2017 21. Juntos was first implemented in the poorest areas and then extended to other areas. Due to this geographical targeting strategy based on poverty indicators, the first areas covered by the programme were the rural ones. The programme was not designed to be addressed only to the rural population but, in its initial stage, was concentrated mainly in these areas (Trivelli & Díaz 2010).

According to the official data, until April 2017 the programme covered 749,349 households in 21 departments (including 1, 304 districts)[3]. The programme was found to have an impact on poverty reduction, utilization of health services, improvement of nutritional intake and increase in primary education (Perova and Vakis 2009).

[2] It is worth noting that in 2012 the eligibility criteria slightly changed and define eligible also households with children aged less than 19 (Alcázar y Espinoza 2014).

[3] See http://www.juntos.gob.pe/modulos/mod_infojuntos/

3. Data

We use Young Lives Data, a longitudinal households survey collected to study childhood poverty. The survey constitutes a rich set of information. In order to have a sample of comparable households (both poor and better-off), the Young Lives team implemented a multi-stage sampling strategy reported in the Young Lives Method Guide (2011) and summarized here.

Firstly, sites predominantly located in poor areas were selected to reflect heterogeneity of ethnicity and religion and were over-sampled to ensure households comparability. Then within the communities, children and their households were randomly selected. The selection of sentinel sites was done relying on a national poverty map (developed by FONCODES, the National Fund for Development and Social Compensation in 2000) that ranks all districts according to a poverty index calculated from variables including infant mortality rates, housing, schooling, roads and access to services. The richer 5% of districts were excluded from the analysis. The coverage of rural, urban, peri-urban and Amazonian areas was ensured. Then, within each selected district, small geographical areas were randomly chosen and within them households with one child in the age of interest of the survey were randomly selected. Young Lives Database was not intended to be nationally representative, but the objective was to ensure analysis of causal relations during long periods of time. However, the Peru survey was compared with other surveys showing that households poverty rates were similar to the ones of ENAHO 2001 but slightly better-off than the ones surveyed by DHS 2000 in terms of access to health and prenatal care services (Escobal and Flores, 2008). Therefore, the survey can be considered representative enough to conduct the analysis.

Data were collected in 4 rounds: Round 1 was conducted in 2002, when the Juntos programme was still not in place, Round 2 in 2006, but still did not contain questions about households' participation in the programme, Round 3 (conducted in 2009) and Round 4 (in 2013) contain questions on the status of beneficiaries/non beneficiaries. In each round 2,766 households were surveyed. There are two types of households in the Young Lives questionnaire. Those having a surveyed child aged 1 year old during the first round (Younger Cohort) and those having a surveyed child aged 8 years during the first round (Older Cohort). The questionnaire was meant to follow children over time, but unfortunately Older Cohort households in Round 4 were not surveyed about all dimensions. For instance, the last round does not contain information on land ownership, transfer and remittances received by the household, and regularity of payment of the Juntos programme. Moreover, another data limitations is that for Round 1 information on consumption is not available.

4. Empirical Analysis

The survey contains two variables that allow us to identify programme beneficiaries, one asking people if they are currently Juntos beneficiaries and one asking if they received Juntos during the last 12 months. We define programme beneficiaries those who reported having received transfers for the programme in the last 12 months. We find some inconsistency between these two variables. For instance, someone answered "I am not a current beneficiary" but then reported to have received the transfer in the last 12 months. This is due to the fact that they stopped receiving benefits after few months (as clear from the control answers). To build a reliable counterfactual, we exclude households who received Juntos in the past but are no longer beneficiaries (because they may still have some long run effect of having received Juntos) and we also exclude households who reported to be current beneficiaries but did not report having received money in the last 12 months (because we are not sure if they are beneficiaries or not)[4].

Recalling that the programme started in 2005, in Round2 of the survey, conducted in 2006, there are people benefiting from the programme but, as mentioned above, no questions about the participation. To build the beneficiary status for Round 2 we rely on retrospective questions asked in Round 3. The number of beneficiaries in Round 2 is still very small since the programme just started to operate, therefore, we do not use Round 2 and we rely on Round 3 to identify beneficiaries.

Cross-checking information about the localities where the survey took place (reported in Escobal and Flores 2008) and the departments where Juntos was implemented, we find that the survey includes also districts were the programme never operated (namely: Callao, Moquega, Tumbes, ICA). To allow a higher level of comparability between treatment and control group we exclude households living in areas not targeted by the programme since they are areas with lower levels of poverty, food insecurity and crimes. Then, we confine the analysis to households living in Sierra (the central area of Peru) because among the households selected to be surveyed by Young Lives in 2002, 99% of Juntos beneficiaries live in this area in 2009 (Round 3). Comparing beneficiaries (mainly located in Sierra) with non-beneficiaries living in other part of the country could have led to misleading results since the two groups may differ for several characteristics. To check whether the study can be country representative, we verify whether the high concentration of households beneficiaries in Sierra, that emerge from the YL data, is representative of the actual country programme coverage. Relying on a document from the Ministerio de Desarrollo e Inclusión Social

[4] We could not crosscheck this information only for the Older Cohort beneficiaries Households of Round 4, since they were no longer surveyed about the question related to having received money from Juntos during the last 12 months. They were surveyed only about the fact of being “current beneficiaries”.

(2014) we calculate that, among the 14 Peruvian departments covered by Juntos in 2009, 10 were in Sierra (namely, Apurimac, Ayacucho, Cajamarca, Cusco, Huancavelica, Huanuco, Junin, La Libertad, Pasco, Puno) and around 83% of the beneficiaries were actually living in Sierra districts. Therefore, the high concentration of beneficiaries found in the YL data is confirmed by the administrative data.

Due to geographical quota, the programme was not implemented in the same period in all eligible districts. To build the counterfactual, we cannot rely on differences in quotas during the programme implementation because all the Sierra departments were targeted by Juntos before 2009. Therefore, we use an approach similar to Andersen et al. (2015), who analysed the Juntos impact on nutrition outcomes relying on Young Lives data.

As mentioned above, in Round 1 (2002) the programme was not operating, hence we have all the pre-programme households' characteristics that allow us to analyse the difference before and after the treatment for beneficiaries and non-beneficiaries.

The main issue to develop an impact evaluation in absence of treatment randomization, is to identify and remove the selection bias through quasi-experiment techniques. Since the programme participation is not random, it is possible that beneficiaries and non-beneficiaries are different not only in their status but also in other observable and unobservable dimensions that determine their eligibility and affect the outcome variables. If beneficiaries and non-beneficiaries are different, not only in the programme participation but also in other dimensions, then we cannot disentangle the effect of the programme from one of these dimensions on the observed outcomes of interest. In this case the estimator can be biased and lead to misleading results. In order to remove the selection-bias, we rely on a two steps procedure. First, we build a control group relying on observable characteristics and calculating a Propensity Score. Second, through a Difference-in-Difference technique we remove the selection bias due to unobserved and time invariant characteristics specific of the treatment and the control group.

a. Descriptive Statistics

After excluding some observations, following the criteria explained above, at baseline (Round 1, in 2002) we have 1,173 households for which we have information about their status in Round 3.

Among them, 429 will become beneficiaries in Round 3 and 744 will not. Table 1 shows households characteristics at baseline. Beneficiaries are more concentrated in rural areas, they have lower wealth index (built relying on housing quality index, access to service index and consumer durable index) with respect to future non-beneficiaries. Future beneficiaries own more livestock

and agricultural assets but less non-agricultural assets. This may be explained by the fact that better-off households are likely to be less engaged in farm or pastoral activities and more involved in micro-enterprise activities. Indeed, the correlation between the wealth index and the ownership of non-agricultural assets is positive while that between the wealth index and the ownership of agricultural assets and livestock is negative. Only 29% of future beneficiary households have a children caregiver who is literate against the 77% of non-beneficiaries. Moreover, 91% of non-beneficiaries speak Spanish against 40% of beneficiaries who speak other languages. Future beneficiaries and non-beneficiaries at baseline are significantly different in most of the community and households characteristics.

Table 1: Beneficiaries and Non-beneficiaries at Baseline

	Non-Beneficiaries				Beneficiaries					
	N	**Mean**	**Min**	**Max**	**N**	**Mean**	**Min**	**Max**	**Diff**	**P-value**
Community Characteristics										
Rural Area=1	744	0.265	0	1	429	0.804	0	1	-0.539	0.000
Percentage of households reporting crime in the community	744	0.081	0	0.217	429	0.076	0	0.189	0.005	0.080
Percentage of households reporting stunting children in the community	744	0.304	0	0.75	429	0.486	0	0.806	-0.183	0.000
Household composition										
Household size	744	5.618	2	16	429	6.14	2	18	-0.522	0.000
Presence of children under 7 in the household=1	744	0.941	0	1	429	0.986	0	1	-0.045	0.000
Household Head Age	744	36.827	17	83	416	35.608	16	73	1.218	0.089
Househol Head Sex	744	0.862	0	1	429	0.886	0	1	-0.024	0.235
Caregiver is literate=1	744	0.774	0	1	429	0.289	0	1	0.485	0.000
Household Etnicity										
White	744	0.043	0	1	429	0.023	0	1	0.020	0.080
Mestizo	744	0.956	0	1	429	0.977	0	1	-0.021	0.065
Household First Language										
Spanish	732	0.914	0	1	423	0.404	0	1	0.510	0.000
Quechua	732	0.074	0	1	423	0.546	0	1	-0.472	0.000
Other	732	0.012	0	1	423	0.05	0	1	-0.037	0.000
Household Economic Status										
Households reporting shocks in the last 12 months	744	0.403	0	1	429	0.338	0	1	0.065	0.027

Housing Quality Index	743	0.417	0.006	1	428	0.241	0	0.785	0.177	0.000
Access to Service Index	743	0.663	0	1	428	0.305	0	1	0.358	0.000
Consumer Durables Index	744	0.29	0	0.917	429	0.108	0	0.75	0.182	0.000
Ownership of any livestock	744	0.684	0	1	429	0.97	0	1	-0.286	0.000
Ownership of production animals	744	0.68	0	1	429	0.97	0	1	-0.290	0.000
Number of owned production animals	744	13.325	0	311	429	24.014	0	298	-10.689	0.000
Ownership of draft animals	744	0.257	0	1	429	0.524	0	1	-0.268	0.000
Number of owned draft animals	744	0.794	0	15	429	1.131	0	13	-0.336	0.002
Agricultural assets ownership	744	0.591	0	1	429	0.963	0	1	-0.371	0.000
Non-Agricultural assets ownership	744	0.675	0	1	429	0.235	0	1	0.439	0.000

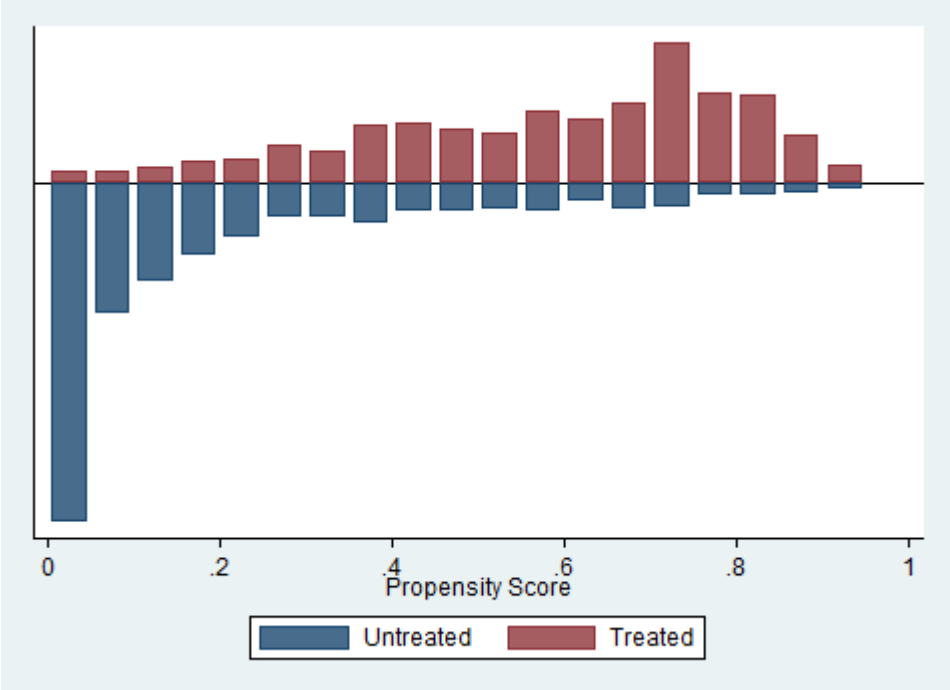
b. Methods

Since the programme eligibility was based on observable characteristics, we rely on them to identify a counterfactual for treated households. We implement a Propensity Score Matching, calculating the probability of being beneficiary through a logit model. In particular, we compute the probability of being eligible in Round 3 given the pre-programme households characteristics in Round 1. To calculate the Propensity Score, we included the programme targeting criteria and some other households' demographic and educational characteristics[5]. As reported in Section III, the targeting strategy of Juntos includes geographical targeting, categorical targeting, proxy-means test and community based targeting. To take into account the variables used for the geographical targeting, we calculate and include in the propensity score calculation the percentage of crime and of stunting children registered in each community. Then, to account for the categorical component of the targeting strategy, we also include a dummy equal to one when, within the household, there was at least one child aged under 7 in 2002, so that in 2009 the household could be still eligible for the programme having at least one child aged less than 14. Then we also rely on proxies of the

[5] One issue of implementing the Propensity Score Matching consists in the fact that we use the characteristics of households in 2002. People who were identified by the survey as beneficiaries in Round 3, were selected by the programme in different points in time starting from 2005. However, it is possible that, between 2002 and the date households started to be beneficiaries, some of the baseline observable characteristics included in the Propensity Score Matching followed different trends for different households, differently affecting households' eligibility for the programme. One solution could be to rely on characteristics of Round 2 (collected in 2006) but we cannot do it because the programme was announced and implemented in 2005, therefore, it is possible that some households characteristic in 2006 (e.g. housing quality index or consumer durables index) was already affected by the programme implementation (for households selected by the programme) or by some anticipation effects (e.g. the household demographic composition for households who wanted to apply for the programme).

household poverty level such as the wealth index (which includes the housing quality index, consumer durables index and access to services) and we include the household size and the educational level of children caregiver within the household. The final step of targeting is community-based and is not driven by formal rules, hence the only thing we cannot control are the criteria implemented by each community to validate the list of potential beneficiaries. The Propensity Score Matching allows us to identify a common support for beneficiary households (Figure 1) and to exclude households who show very different characteristics with respect to those eligible for the programme. In particular, we exclude around 20.8% of non-beneficiaries, and 0.5% of beneficiary, who are out from the common support.

Figure 1: Common Support after Propensity Score Matching



After these operations, we end up with a sample of 1,016 households, 427 beneficiaries and 589 non-beneficiaries. We compute the standardized mean difference to check whether the two groups are similar in observable characteristics used to define eligibility. In Table 2, we show how beneficiaries and non-beneficiaries are not significantly different in the observable eligibility criteria.

Table 2: Comparison between groups after the Propensity Score Matching

	Mean in Treated	Mean in Untreated	P-value for difference
Rural area=1	0.810	0.820	0.630
Percentage of households reporting crime in the community	0.080	0.080	0.540
Percentage of households reporting stunting children in the community	0.490	0.480	0.654
Presence of children under 7 in the household=1	0.990	0.990	0.921
Wealth Index	0.22	0.21	0.550
Household size	0.810	0.820	0.630
Caregiver is literate=1	0.080	0.080	0.540

After the selection of a reliable counterfactual, we implement a Difference in Difference technique between Round 3 and Round 1. This methodology allows us to remove time-invariant unobserved differences between beneficiaries and non-beneficiaries. We estimate the difference in outcomes between beneficiaries and non-beneficiaries after and before the treatment. If the two groups are the same on average in both observable and unobservable time invariant characteristics, except that one is treated and the other is not, then we can ascribe the differences in outcomes to the impact of the treatment.

Our dependant variables of interest are: (i) household ownership of any livestock; household ownership and number of owned production animals including both ruminant animals (such as sheep, goats, pigs, poultry, rabbits) and milk animals (traditional and modern cows); (ii) household ownership and number of owned draft animals (including: donkey, horses, mules and oxen); (iii) household ownership of agricultural assets (for instance: shovel, rakes, cart/wheelbarrow, motorised saw, animal drawn plough, storehouse/granary, silos and harvester tractor); (iv) household ownership of non-agricultural assets (namely: construction tools, food preparation equipment, transport equipment, weaving equipment and computer) .

It is worth noting that questions related to agricultural and non-agricultural assets, in Round 3 specifically ask if these assets were used for income-generating activities. Therefore, we can interpret these variables as the fact that the household is involved in income-generating micro-enterprise or farm activities.

Firstly, we estimate the following model with no covariates:

$$\boldsymbol{Y_{it} = \alpha + \beta T_i + \gamma t_i + \delta (T_i \cdot t_i) + u_{it}} \qquad \textbf{(1)}$$

Where, α is a constant term, β is the treatment group specific effect, γ is the time trend and δ is the true effect of treatment (the difference in difference estimator), u is the error term.

Then we control for a vector of covariate X, including: type site (rural or urban); housing quality index; consumer durables index; access to service index; other transfers received by the household (namely: transfers from religious organizations; transfers from charity groups; donations; other transfers); shocks that affected the households in last 12 months (environmental shocks; crime shocks; economic shocks; family shocks); and household size.

$$\boldsymbol{Y_{it} = \alpha + \beta T_i + \gamma t_i + \delta(T_i \cdot t_i) + \theta X_{it} + u_{it}} \qquad \textbf{(2)}$$

In Round 4 for the older cohort households, we do not have information about: other kind of transfers received by the households (therefore we cannot control for them); about the Juntos payment frequency; and we cannot cross-check information on household's programme participation. For this reason, we use Round 4 just for the robustness check and to analyse whether the effect of the programme is sustained over time for households that were beneficiaries in both rounds.

5. Results

We investigate whether the conditional cash transfer programme Juntos has an impact on the productive investment decision of beneficiaries. In Table 3 we present the results of Model 1, showing the Difference in Difference estimator. Results suggest that beneficiary households are significantly more likely to own draft animals with respect to non-beneficiaries and also to increase the number of owned draft animals. Moreover, beneficiaries are also significantly more likely to invest in agricultural assets used for income generating farm activities and to invest in non-agricultural assets used for micro-enterprise activities.

Table 3: Impact on Productive Assets and Activities

	Livestock=1	Production Animals=1	Draft Animals=1	Number of Production Animals	Number of Draft Animals	Agricultural Assets=1	Non-agricultural Assets=1
Juntos	-0.006	0.044	0.071*	-0.012	0.097**	0.140***	0.168***
	(0.0240)	(0.0258)	(0.0331)	(1.628)	(0.129)	(0.0246)	(0.0353)
N	1,016	1,016	1,016	1,016	1,016	910	910

Standardized beta coefficients; Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table 4 shows the results for Model 2 when we control for other covariates (that can be interpreted as changes between Round 3 and Round 1). The specification with covariates confirms all the

results of Table 3 except for the coefficient related to the ownership of draft animals which is no longer significant.

The impact of Juntos on investments in number of draft animals, is still positive and significant at 95% of significance while coefficients related to agricultural and non-agricultural assets are still significant at 99.9%. Our results confirm the existing evidence about the fact that an injection of liquidity may allow households to invest in productive assets and engage in income-generating activities[6].

We also want to test whether the conditional cash transfer is more likely to relax liquidity constraints or to be used as an insurance for risky investments thanks to the fact that the transfer (by design) is regular and predictable. Ideally, we could test this hypothesis relying on the fact that households with only children aged 14 (which until 2012 was the age threshold to receive the transfer) will not be eligible in the future and check whether these households changed investment decision due to the lack of an insurance for the future. Unluckily, in Round 3, 94.4% of households have at least one child aged under 10. Therefore, the sample of households that will have to leave the programme soon (households with children aged between 10 and 14 years) is too small to test our hypothesis. However, the high percentage of households with children aged under 10 means that, *ceteris paribus,* most households of our sample know that they could still be eligible for the transfer at least for other 4 years, until all children turn 14. Given these data limitations we cannot directly test the aforementioned hypothesis. However, we build an indicator of other transfers, for which we control for. The indicator includes transfers that consist in lump sum given without predictability and frequency, such as transfers from religious organizations, from charity groups, donations, and other non-specified transfers different from predictable transfers (for instance, excluding pensions and social security).

[6] It could be interesting also to look only at the programme impact on households who did not own assets at baseline but unfortunately the sample is too small to conduct an analysis on this conditional sample.

Table 4: Impact on Productive Assets and Activities- With Covariates

	Livestock=1	Production Animals=1	Draft Animals=1	Number of Production Animals	Number of Draft Animals	Agricultural Assets=1	Non-agricultural Assets=1
Juntos	-0.018	0.023	0.049	-0.001	0.086*	0.119***	0.145***
	(0.0262)	(0.0281)	(0.0357)	(1.783)	(0.139)	(0.0265)	(0.0374)
Rural Area=1	0.061	0.047	0.119***	0.081*	0.107**	0.071*	-0.019
	(0.0470)	(0.0505)	(0.0642)	(3.200)	(0.250)	(0.0491)	(0.0693)
Wealth Index	-0.093**	-0.092**	-0.021	0.008	0.035	-0.070*	0.133***
	(0.0965)	(0.104)	(0.132)	(6.566)	(0.513)	(0.104)	(0.146)
Other Trasfers=1	0.017	0.012	0.084**	0.018	0.120***	-0.020	0.082*
	(0.0195)	(0.0209)	(0.0266)	(1.328)	(0.104)	(0.0201)	(0.0284)
Environmental Shocks	0.027	0.050	0.047	-0.062	0.007	0.057	0.046
	(0.0248)	(0.0267)	(0.0339)	(1.690)	(0.132)	(0.0250)	(0.0353)
Crime Shocks	0.028	0.041	-0.007	0.015	0.027	-0.016	-0.029
	(0.0349)	(0.0374)	(0.0476)	(2.373)	(0.185)	(0.0360)	(0.0508)
Economic Shocks	-0.008	-0.000	0.012	0.019	0.001	0.044	0.052
	(0.0239)	(0.0257)	(0.0326)	(1.628)	(0.127)	(0.0243)	(0.0343)
Family Shocks	-0.040	-0.037	0.015	-0.039	0.050	-0.049	-0.014
	(0.0208)	(0.0224)	(0.0284)	(1.418)	(0.111)	(0.0216)	(0.0305)
Male Headed Household=1	0.037	0.059	-0.006	0.015	-0.000	0.026	0.007
	(0.0357)	(0.0383)	(0.0487)	(2.431)	(0.190)	(0.0392)	(0.0553)
Household Size	0.081*	0.066*	0.073*	0.109***	0.099**	0.074*	0.037
	(0.00594)	(0.00638)	(0.00811)	(0.404)	(0.0316)	(0.00635)	(0.00896)
N	986	986	986	986	986	881	881

Standardized beta coefficients; Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Looking at the coefficient related to other unpredictable transfers we can observe that its impact on dependent variables related to draft animals and non-agricultural assets is positive and significant.

Our findings, suggest that predictability of payment does not play a central role in the case of Juntos, since also unpredictable transfers have an effect on investments. Therefore, it is possible that the main role of Juntos is to relax liquidity constraints rather to work as an insurance for risky investments.

Another purpose of our analysis is to check whether the programme features, such as transfer regularity and length of programme exposure affect investment decisions. To this end, we build different conditional samples first comparing beneficiaries that receive the transfer regularly with non-beneficiaries and then comparing beneficiaries that do not receive the transfer regularly with non-beneficiaries. Coefficients are higher and more significant for beneficiaries that receive the transfer regularly (see Table 5). However, looking at the P-value for the difference between

coefficients we can conclude that the two groups (beneficiaries who received the transfer regularly and who did not) are not significantly different.

We pass to analyse whether the length of programme exposure affect investment choices. Our results (see Table 6) suggest that beneficiaries that receive the transfer for less than two years are still significantly more likely to invest in agricultural assets and non-agricultural assets with respect to non-beneficiaries but only beneficiaries who receive the transfer for more than two years are also more likely to invest in draft animals with respect to non-beneficiaries. Also in this case, coefficients for the two groups are not significantly different. We can conclude that the programme features do not significantly affect outcomes differently across beneficiaries.

Table 5: Programme Regularity

	Livestock=1	Production Animals=1	Draft Animals=1	Number of Production Animals	Number of Draft Animals	Agricultural Assets=1	Non-agricultural Assets=1
Impact on Productive Assets - Beneficiaries who did receive the transfers regularly							
Juntos	-0.023	0.007	0.048	-0.007	0.080*	0.103**	0.132***
	(0.0329)	(0.0353)	(0.0405)	(2.081)	(0.169)	(0.0324)	(0.0442)
N	811	811	811	811	811	709	709
Impact on Productive Assets - Beneficiaries who did not receive the transfers regularly							
Juntos	-0.000	0.037	0.034	0.019	0.075	0.087*	0.120**
	(0.0383)	(0.0406)	(0.0437)	(2.145)	(0.178)	(0.0392)	(0.0522)
N	744	744	744	744	744	645	645
P-value for difference	0.4151	0.2469	0.8258	0.6358	0.9076	0.9152	0.9632

Standardized beta coefficients; Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table 6: Programme Duration

	Livestock=1	Production Animals=1	Draft Animals=1	Number of Production Animals	Number of Draft Animals	Agricultural Assets=1	Non-agricultural Assets=1
Impact on Productive Assets - Beneficiaries who receive the transfers for less than 2 years							
Juntos	-0.036	-0.015	-0.017	-0.032	0.045	0.107**	0.114**
	(0.0370)	(0.0398)	(0.0427)	(2.003)	(0.176)	(0.0384)	(0.0503)
N	742	742	742	742	742	639	639
Impact on Productive Assets - Beneficiaries who receive the transfers for more than 2 years							
Juntos	0.005	0.049	0.083*	0.023	0.095*	0.086*	0.140***
	(0.0337)	(0.0357)	(0.0413)	(2.186)	(0.171)	(0.0328)	(0.0455)
N	818	818	818	818	818	720	720
P-value for difference	0.0983	0.0275	0.0767	0.2981	0.2616	0.2379	0.7296

Standardized beta coefficients; Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Finally, we divide the sample according to the wealth index (hereafter WI). Comparing beneficiaries and non-beneficiaries with a WI level below the median we do not find significant

programme effect. Conversely, for households with a WI higher than the median, we do find that the programme impact for beneficiaries is positive and significant for both agricultural and non-agricultural assets used for income generating activities. The numerical coefficients of the two sub-samples are not significantly different, however Table 7 suggests that the programme produces a stronger impact for better-off beneficiaries. This finding is consistent with the theory that people may have access to more productive technologies (or in our case to productive assets) only if they are above a certain poverty threshold. In our case, it seems that the CCT is able to positively and significantly affect beneficiaries who are relatively better-off in terms of wealth, while it is not able to do the same for beneficiaries who are far from a certain WI threshold. In sum, the programme seems to have an impact on the poor but not on the poorest of the poor.

Table 7: Impact on beneficiaries with different levels of Wealth Index

	Livestock=1	Production Animals=1	Draft Animals=1	Number of Production Animals	Number of Draft Animals	Agricultural Assets=1	Non-agricultural Assets=1
Impact on Productive Assets - WI Below the median							
Juntos	0.034	0.060	0.016	0.060	0.052	0.048	0.026
	(0.0230)	(0.0276)	(0.0571)	(2.327)	(0.218)	(0.0224)	(0.0433)
N	493	493	493	493	493	474	474
Impact on Productive Assets - WI Above the median							
Juntos	-0.073	-0.041	0.040	-0.083	0.055	0.108*	0.108*
	(0.0560)	(0.0580)	(0.0490)	(3.172)	(0.197)	(0.0588)	(0.0701)
N	493	493	493	493	493	407	407
P-value for difference	0.0236	0.0924	0.8118	0.0993	0.9239	0.0694	0.1435

Standardized beta coefficients; Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

6. Robustness Check

As mentioned above, we use Round 3 for our analysis, since we do not have all the information for Round 4. In particular, in Round 4 we do not have information about the payment frequency and about the other transfers received by the Older Cohort households, so we cannot control for these variables. Therefore, we use Round 4 only for a robustness check. First, we calculate the Difference in Difference estimator without covariates relying on Round 1 and Round 4. We analyse only households in the common support and people who are beneficiaries in both Round 3 and Round 4, that are 301 individuals (see Table 8). We find a positive and significant impact of the programme on all the dependent variables that were found to be significant relying on Round 3 (see Table 3) except for the draft animal ownership, which coefficient was found to be significant for Round 3 but not for Round 4 (see Table 9).

Table 8: Beneficiary status in Round 3 and Round 4

		Round 4			
		Untreated	Treated	Missing	Total
Round3	Untreated	297	100	192	589
	Treated	24	301	102	427
	Total	321	401	294	**1,016**

Additionally, for households that are beneficiaries in both Round 3 and Round 4, the programme has a positive and significant impact also on livestock ownership and on production animals ownership. Controlling for the same covariates used in the rest of the analysis (except for other transfers received by the household) results are partially confirmed. With respect to Round 3, the programme impact is still positive and significant at 99.9% for non-agricultural assets. However, the coefficient related to agricultural assets loses significance shifting from 99.9% to 99% of significance level. Finally, the coefficient related to the number of draft animals is no longer significant in Round 4. Also controlling for covariates, beneficiary households are significantly more likely to invest in livestock and in production animals with respect to non-beneficiaries. While initially (in Round 3) beneficiary households invest in draft animals, agricultural and non-agricultural assets, then they start to invest also in other kind of livestock, particularly in production animals. The fact that households start to invest also in production animals is consistent with the idea that households tend to combine different assets to achieve the preferred risk-return combination (Zimmerman and Carter 2003). Moreover, after a certain threshold of the same kind of accumulated assets, the returns may start to be decreasing and therefore investing in other assets may be more convenient.

A problem for our analysis is that to build the counterfactual we could not rely on differences in quota determined by the geographical roll-out of the programme, since all the Sierra departments were targeted before 2009. However, in Round 4 there are 100 new beneficiaries in Sierra (see Table 8). We then conduct a robustness check comparing beneficiaries of Round 3 with these 100 people who are not beneficiaries in Round 3 but become beneficiaries in Round 4.

Table 9: Robustness Check: Using data from Round 4

	Livestock=1	Production Animals=1	Draft Animals=1	Number of Production Animals	Number of Draft Animals	Agricultural Assets=1	Non-agricultural Assets=1
Impact on Productive Assets-Without Covariates							
Juntos	0.351***	0.464***	0.040	0.131**	0.133**	0.250***	0.115*
	(0.0355)	(0.0353)	(0.0540)	(2.194)	(0.206)	(0.0361)	(0.0552)
N	512	553	553	553	512	433	433
Impact on Productive Assets- With covariates							
Juntos	0.190***	0.242***	0.057	-0.009	0.072	0.139**	0.120*
	(0.0373)	(0.0381)	(0.0605)	(2.570)	(0.235)	(0.0376)	(0.0598)
N	504	504	504	504	504	433	433

Standardized beta coefficients; Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table 10 suggests that only the coefficient related to the number of owned draft animals is still significant, other coefficients maintain the same sign, but they lose significance. However, we should be cautious in interpreting the results since, in this case, the sample is small (100 non-beneficiaries).

Table 10: Robustness Check: Including 100 new beneficiaries

	Livestock=1	Production Animals=1	Draft Animals=1	Number of Production Animals	Number of Draft Animals	Agricultural Assets=1	Non-agricultural Assets=1
Impact on Productive Assets- Without Covariates							
Juntos	-0.030	-0.017	0.065	0.077	0.087*	0.012	0.039
	(0.0261)	(0.0303)	(0.0670)	(3.354)	(0.232)	(0.0263)	(0.0543)
N	527	527	527	527	527	511	511
Impact on Productive Assets- With Covariates							
Juntos	-0.031	-0.017	0.051	0.069	0.060	0.014	0.046
	(0.0272)	(0.0314)	(0.0690)	(3.489)	(0.236)	(0.0272)	(0.0551)
N	516	516	516	516	516	501	501

Standardized beta coefficients; Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

7. Conclusion

The paper provides an impact evaluation of the Juntos programme on households' decisions to invest in livestock, and agricultural and non-agricultural assets used for income generating activities. The main idea is that cash transfer can relax households liquidity constraints and (when regular and predictable) can push households to invest in risky but higher-return activities. The reason why households should invest the saved amount in productive assets and activities is linked to the fact that these programmes have a limited duration, and the investment in productive assets and activities is one of the channels through which beneficiaries can maintain the living standards reached thanks to the programme also after its termination. Moreover, assets accumulation

represents an insurance for consumption in case of bad economic conditions. To assess the programme impact, we rely on Propensity Score Matching and Difference in Difference. We show that beneficiaries households are significantly more likely to invest in agricultural and non-agricultural assets used for income generating activities and livestock. Comparing the programme impact with the effect of other unpredictable transfer received by the households, we argue that the main role of Juntos is to relax liquidity constraints rather than to work as an insurance for risky investments. Moreover, we analyse two programme features: the transfer regularity and the programme duration. We show that programme duration and transfers regularity do not produce significant differences between groups of beneficiaries and non-beneficiaries. We also show that the programme has a productive role for the poor but not for the poorest of the poor. We check the robustness of our results using outcomes from another survey round and we find that results are robust and that the programme shows a sustained impact over time.

This paper shows that, beyond the mere protection, the Juntos programme has also a production role, positively affecting beneficiaries' decisions to invest in productive assets and activities. Hence, cash transfer programmes may affect poverty not only in the short-term during the programme implementation but also in the long-term, through investments in assets and activities that may support poor households also after the programme termination.

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APPENDIX

Table A.1 Impact on Rural and Urban Areas

	Livestock=1	Production Animals=1	Draft Animals=1	Number of Production Animals	Number of Draft Animals	Agricultural Assets=1	Non-agricultural Assets=1
Impact on Productive Assets - People who live in rural area							
Juntos	0.026	0.070	0.017	0.120**	0.129**	0.033	0.095*
	(0.0157)	(0.0206)	(0.0560)	(2.632)	(0.212)	(0.0207)	(0.0442)
N	501	501	501	501	501	491	491
Impact on Productive Assets - People who live in urban areas							
Juntos	-0.038	-0.005	-0.051	-0.200***	-0.104*	0.137**	0.145**
	(0.0569)	(0.0596)	(0.0477)	(2.534)	(0.195)	(0.0576)	(0.0703)
N	515	515	515	515	515	419	419
P-value for difference	0.2178	0.4504	0.3674	0.0003	0.0010	0.0029	0.1486

We check the programme impact on two subsamples of people living in rural or in urban areas. We find that in both rural and urban areas the programme positively and significantly affects beneficiaries investments in non-agricultural assets used for income generating activities. Conversely, as expected, only in rural areas programme beneficiaries are more likely to invest in livestock while in urban areas the opposite happens. One interesting result is that only in urban areas the impact of the programme on agricultural assets is positive and significant, while in rural areas is positive but not significant. This result can be explained by the fact that in our sample (in Round 3), around 37% of urban households own land for agricultural purposes.