Schooling and Work in Zambia's Child Grant Program

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Abstract

This paper reports the impact on child schooling and work of the Government of Zambia's Child Grant Program (CGP), an unconditional cash transfer program targeted to households with children under age 5 years in three districts of the country. Although the CGP focus is on very young children, we look to see if nevertheless the program has impacts on older children who are not the explicit target group. We use data from a large-scale social experiment involving 2,500 households, half of whom were randomized out to a delayed-entry control group, that was implemented to assess the impact of the program. Ex-ante analysis suggests that given the pattern of income effects and structural features of the Zambian schooling system, we would see impacts at very young ages, at the age of drop out, and no impacts on child labor. Indeed, actual estimated impacts indicate that the CT is proven to be effective in raising school enrolment but not in reducing child labour. Program impacts on enrollment at age 4-7 range from 5 to 6 percentage points; large impacts from 6 to 9 percentage points are also reported for children age 11-14 years old who are transitioning to lower secondary school. These impacts compare quite favorably with the ones reported in the CCTs literature. There seem to be no impact on child labour for the younger age groups although there is a significant reduction in participation in paid work around 4 percentage points for the 11-14 year olds. We also provide some preliminary evidence on the potential pathways through which the unconditional cash transfer impacts on enrollment.

Keywords: child labour, schooling, Zambia, unconditional cash transfer, impact, treatment effect, RCT

Acknowledgements: This paper has benefited from comments made by Mumbi Christopher, Headmaster of Serenje Boma Secondary/Primary School, and Mulenga Astone, teacher in the basic school of Chimfunde, Serenje.

Introduction

This paper reports the impact on child schooling and work of the Government of Zambia's Child Grant Program (CGP), an unconditional cash transfer program targeted to households with children under age 5 years in three districts of the country. Fizbein and Schady (2009) report that conditional cash transfers (CCT) for schooling are effective in raising school enrolment and attendance, and in middle income countries where primary school enrolment rates are already high CCT impacts have been more significant at the secondary school level. Meanwhile a Campbell Systematic Review by Baird et al (2013) found no systematic difference in schooling impacts between CCTs and unconditional cash transfers (CTs). A recent review by the Transfer Project that focuses on secondary school-age children only also concludes that national CT programs tend to have schooling impact that are at least as large as those reported from evaluations of national CCTs.[1] However CCTs have traditionally been implemented in Latin America while most programs in sub-Saharan Africa (SSA) are CTs, so cross-country comparisons of CT versus CCT impacts are likely to confound overall levels of development, supply side constraints, differences in out-of-pocket costs associated with schooling, and values placed on education.

One intriguing feature of CTs is that, since money is not tied to behavior, impacts may be found in any sphere, depending on what the major constraints are facing households, and how the household itself believes the cash can best address its needs. Indeed this attractive feature of CTs has often been used against them to justify the impositon of conditions, for example by arguing that households do not internalize the full social benefits of investments in areas such as health and education and so must be compelled to do so. Where one stands in the CT versus CCT debate often depends on how one views a cash transfer. In Africa, the social protection movement has been primarily driven by poverty alleviation within a human rights framework, which, along with the relatively low supply of services such as health and schooling, has probably led to CTs as a natural part of the development dialogue.

In this article we exploit the interesting feature of the unconditional nature of the Zambian CGP, which targets families with pre-schoolers and whose objectives are focused on very young children, to see if the program has an impact on the schooling and work of school-age children who in principle are not the main target population of the program. We use data from a large-scale social experiment involving 2,500 households, half of whom were randomized out to a delayed-entry control group, that was implemented to assess the impact of the program. There have been several published studies on the impact of CCTs on schooling (Schultz, 2004; Attanasio et al, 2010; Sadoulet et al, 2004; Dammert, 2009; Paxson and Schady, 2007), all showing different magnitudes of positive impacts though in each of these cases of course program participation is conditional on schooling related behavior. Published evidence from CTs is less abundant, with the exception of Kenya CT-OVC Evaluation Team (2012), though a substantial grey literature does exist.[2]

[1] http://www.ipc-undp.org/pub/IPCOnePager147.pdf

[2] See evaluation reports from Ghana, Zambia and Lesotho at www.cpc.unc\projects\transfer.

2 Decription of program

In 2010, Zambia's MCDSS started the rollout of the CGP in three districts: Kalabo, Kaputa, and Shongombo. This categorical model targets any household with a child under 5 years old. Recipient households receive 60 kwacha (KW) a month (equivalent to U.S. $11), an amount deemed sufficient to purchase one meal a day for everyone in the household for one month. The amount is the same regardless of household size. Payments are made every other month through a local paypoint manager, and there are no conditions to receive the money. The MCDSS chose to start the CGP in the three districts within Zambia that have the highest rates of mortality, morbidity, stunting, and wasting among children under 5, thus introducing an element of geographical targeting to the program. The three districts are Kaputa, located in Northern Province; Shongombo, located in Western Province; and Kalabo, also located in Western Province. All three districts are near the Zambian border with either the Democratic Republic of Congo (Kaputa) or Angola (Shongombo and Kalabo) and require a minimum of two days of travel by car to reach from the capital, Lusaka. Because Shongombo and Kalabo are cut off from Lusaka by a flood plain that turns into a river in the rainy season, they can be reached only by boat during some months of the year. These districts represent some of the most remote locations in Zambia, making them a challenge for providing support services, and are some of the most underprivileged communities in Zambia.

The objectives of the program relate to five primary areas: income, education, health, food security, and livelihoods. More specifically, the objectives of the program are (in no specific order) to: 1) supplement and not replace household income; 2) increase the number of children enrolled in and attending primary school; 3) reduce the rate of mortality and morbidity of children under 5; 4) reduce stunting and wasting among children under 5; 5) increase the number of households having a second meal per day; 6) increase the number of households owning assets such as livestock.

3 Evaluation Design

The CGP impact evaluation relies on a randomized design to estimate the effects of the program on recipients. Communities designated by Community Welfare Assistance Committees (CWACs) were randomly assigned to either the treatment condition to start the program in December 2010 or to the delayed control condition to start the program at the end of 2013. The MCDSS decided to implement a randomly assigned delayed control group because it did not have sufficient resources or capacity to deliver the program to all eligible households immediately. Thus, the Ministry instituted a policy of randomly assigning communities to current or delayed treatment, deeming it to be the most ethical and fair way to select the order in which communities receive the resources as they became available.

This study includes several levels of random selection, including CWACs within districts and households within CWACs. It is a multisite RCT because random assignment of CWACs occurs within each of the three districts. The Ministry conducted the first step of the randomization process by selecting and ordering 30 CWACs within each district (out of roughly 100 CWACs in each district) through a lottery held at the Ministry headquarters in June 2010 with Ministry staff from the three districts participating. This process created transparency and understanding about how the communities were selected for everyone involved in implementing the program. After the 90 CWACs were randomly selected (30 from each district) for the study, CWAC members and Ministry staff identified all eligible households with at least one child under 3 years old in the study communities. This process resulted in more than 100 eligible households in each CWAC; 28 households were then randomly sampled from each CWAC for inclusion in the study.[3] Baseline data were collected for the 28 randomly sampled households in each randomly selected CWAC in each district (30 CWACs per district) and located in one of the three geographically targeted districts. The final study sample size was more than 2,500 households.

The baseline data collection began before CWACs were randomly assigned to treatment or control conditions. Neither the households nor the enumerators knew who would benefit now and who would have to wait. Random assignment occurred after the baseline data collection was complete, with the Ministry's Permanent Secretary flipping a coin to determine whether the first half of the list of randomly selected CWACs would be in the treatment or the delayed control condition. This process was conducted in public with local officials, Ministry staff, and community members present as witnesses. Table 1 shows the timing of data collection. Note that wave 3 data was collected during the harvest season in order to assess the impact of the CGP on consumption smoothing, by comparing impacts across the agricultural cycle. Indeed, the 30- and the 36-month observations are gathered during the same (academic) year.

Table 1: Timing of data collection in CGP evaluation

Baseline	Follow-ups		
Wave 1	**Wave 2**	**Wave 3**	**Wave 4**
	(24-month)	*(30-month)*	*(36-month)*
Oct-Nov 2010	Oct-Nov 2012	June-July 2013	Oct-Nov 2013

4 Zambian Educational System

Zambia's school system consists of a primary (7 years) and a secondary (5 years) level. Children are expected to enter primary school at age 7 and complete lower basic (grades 1-4) at age 11 and middle basic (grades 5-7) by age 13. Students take common examinations at the end of the primary cycle and successful pupils are awarded a Certificate of Primary Education and allowed to continue onto secondary education.

Secondary education is divided into junior secondary (or upper basic) – which comprises grades 8 and 9 – and senior secondary (or high school) – which corresponds to grades 10 to 12. Again, there are common examinations at the end of grade 9 (Junior Secondary School Certificate) and successful students are allowed to continue onto senior secondary. Successful completion of high school requires passing the School Certificate Examination by the end of grade 12. This examination is also used for selection into tertiary education programs at universities, colleges and technical institutes.

Funding of the education system in Zambia comes from a variety of sources including public expenditure, multilateral and bilateral donor agencies, corporate and private investors, local communities and households[4]. According to UNESCO, for the period 2004-2010, over 60 per cent of education expenditures were from donor resources[5]. Despite international aid, the country's expenditure in education has remained below the region's average – 5 per cent of the GDP[6]. In 2008,

[3] The sample size was determined through a power analysis to ensure that the study was able to detect meaningful effects. The 28 households per CWAC and 30 CWACs per district result from this power analysis.
[4] http://www.sacmeq.org/sites/default/files/sacmeq/reports/sacmeq-iii/national-reports/s3_zambia_final.pdf, p6
[5] Education for All Monitoring Report 2012, Chapter: Financing Education for All, UNESCO, p 146
[6] http://www.unesco.org/new/en/media-services/single view/news/education_investment_jump_in_sub_saharan_africa_pays_dividends_with_more_children_in_school_than_ever_says_unesco_report/

Zambia's 1.3 per cent of GDP allocation to the education system was the second lowest among sub-Saharan economies.

Enrolment in primary education[7] has been steadily increasing over the last 10 years: it went from 70.5 per cent in 2001 to 85.9 per cent in 2004 and 93.7 per cent in 2012[8]. Primary completion rates have increased from 63.3 per cent in 2000 to 74.1 per cent in 2004 and 91.3 per cent in 2012. However, it is important to note that children are entering school at later ages. During 2004 to 2012, less than 47 per cent of children entered school at age 7[9] while the rest waited to enroll later[10]. The reasons for late enrolment range from inadequate classroom space, long distances to schools, socio-economic and cultural beliefs [11].

Although primary completion rates are above 90 per cent, transition to lower secondary education has not improved much. According to the latest data, of those students who were enrolled in primary education in 2010, only 56 per cent continued to secondary education – a percentage similar to the one recorded in 2001. Moreover, because of inefficiencies in the transition from primary to secondary education and within the lower secondary cycle, of those who should be graduating from upper basic (junior secondary, grades 8 to 9) only about 40 per cent actually do[12].

There are indeed a number of barriers that prevent child schooling. There are economic constraints; school is free up to grade 7, however school fees were not abolished for higher grades. Moreover, even though no formal fee is charged at primary level, there are still some informal fees that households often incur such as PTA or other types of contributions. Other indirect costs encompass, among others, uniforms and shoes; these are often compulsory at secondary level but there is social stigma attached with not owning these items even in primary; moreover, there are stationary and equipment costs. Another important physical constraint is distance; indeed, it takes a long time to travel to school, even primary school. For this reason, there are children that move and leave away from home; not only this represents an extra cost on households, often accompanied by transpost costs, but it also represents a risk for children who have to live on their own. Barriers to female access are particularly stringent; indeed, education for girls is not valued; safety risks are seen to be higher for girls walking long distances to school or living on their own (because of fear of assault); moreover, the lack of sanitation might prevent girls to continue schooling after attaining menarche; also, parents might be eager to have girls married resulting in early marriage and drop out.

The education system has quality challenges. Several studies point towards the need of improvement in school infrastructure[13], teacher qualifications, teaching and learning materials[14], among others. In particular, some schools provide inadequate learning environments, others are too far away from

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[7] Net School Enrollment measured as the total is the ratio of children of the official primary school age who are enrolled in primary school to the total population of the official primary school age.
[8] World Development Indicators, World Bank
[9] The average net intake ratio in grade 1 for the period 2004-2012 was 47.6 per cent. The average net intake ratio corresponds to the number of new entrants in the first grade of primary education who are of the official primary school-entrance age, expressed as a percentage of the population of the same age.
[10] As suggested by the average gross intake ratio in grade 1 for the period 2004-2012, 118 per cent. The average gross intake ratio is the number of new entrants in the first grade of primary education regardless of age, expressed as a percentage of the population of the official primary entrance age.
[11] http://www.sacmeq.org/sites/default/files/sacmeq/reports/sacmeq-iii/national-reports/s3_zambia_final.pdf , p 16.
[12] World Development Indicators, World Bank
[13] http://www.camb-ed.com/fasttrackinitiative/download/FTI_DS_Zambia%28Feb2010x%29.pdf, p 6
[14] http://www.osisa.org/sites/default/files/afrimap_zambia_education_main_report_web_5july_0.pdf, p3

students[15], and many have overcrowded classes[16]. Such inefficiencies could be hindering the improvement in quality education indicators. For example, Zambia has a literacy rate of around 61 per cent[17] with 25 per cent of its youth still remaining not fully literate[18]. The country also does poorly with respect to its neighbors: it achieved the lowest score and second lowest scores in reading and math, respectively in the 2007 SACMEQ[19] evaluation[20].

5 Hypotheses and Empirical Strategy

As mentioned earlier the CGP is targeted to families with very young children and its primary objectives relate to young child health and nutrition. There are 2,515 households and 14,565 people in the evaluation study, including 4,793 children ages 5 and under, with the largest number under 1 year old (1,427). Figure 1 below capture the age distribution of children age 0-17 at baseline and then after 2 and 3 years. These density graphs show indeed that the majority of children in these beneficiary households are under age 5 at baseline and even by wave 3 (three years after program initiation) the modal age is less than 5. In contrast there are very few children over age 13.

Figure 1. Age distribution of children in the Child Grant Program

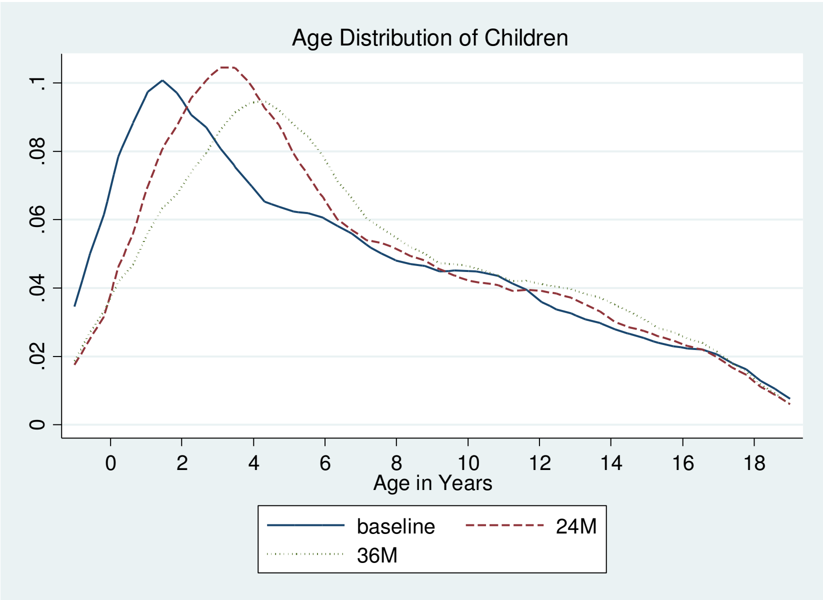
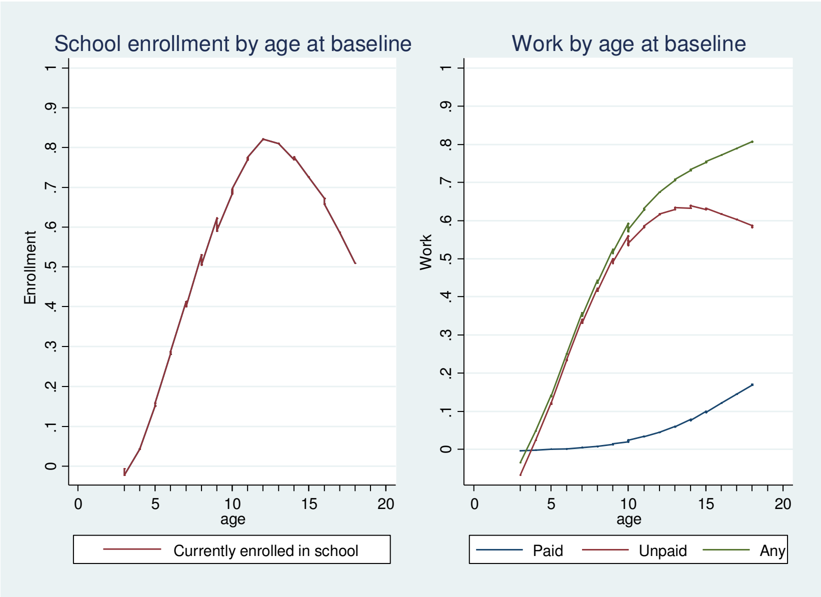


Figure 2 presents density graphs for school enrollment and work by age to understand the pattern of schooling in Zambia. School enrollment rates incerase steeply starting from age 4/5 but are still only at 50 per cent by age 7 which is the compulsory age of enrollment, and continue to increase through age 12/13 at which point drop-outs begin. This is the age that coincides with the rather sharp increase in paid work diplayed in the right hand panel of Figure 2. Note that there is very little paid work until around this age, and around this time unpaid work is displaced by paid work. These trends suggest that

[15] http://www.sacmeq.org/sites/default/files/sacmeq/reports/sacmeq-iii/national-reports/s3_zambia_final.pdf, p 71
[16] Zambia – Education for All Profile. UNESCO, 2012. p
[17] World Bank Development Indicators
[18] Education for All. Zambia's Profile, p 1.
[19] Southern Africa Consortium For Measurement of Educational Quality
[20] http://www.sacmeq.org/sites/default/files/sacmeq/reports/sacmeq-iii/workingdocuments/wd01_sacmeq_iii_results_pupil_achievement.pdf

the CGP might encourage the on-time enrollment into school of younger kids who are entering the system for the first time, but may also delay drop-outs around ages 12-13. For work on the other hand, the space to have impacts is above age 13/14 and there are very few children in that age group in the CGP—we thus do not expect to see much impact, if any, on work given the nature of the target population.

Figure 2. School and work by age at baseline



Beyond structural features of the school system, the impact of the CGP on schooling will also depend on the income elasticity of demand for schooling. We use baseline data on our entire sample to understand what the relationship is between income (proxied by total household per capita consumption) and school enrollment as a way of helping us assess where we might reasonably expect to see program impacts. We regress school enrollment on a series of 3 year age groups using a basic set of covariates (household composition, schooling, age and sex of household head, district fixed effects, sex of child) and per capita consumption. We recover the coefficient of per capita consumption for each of the age bands and plot the result in Figure 3 along with the confidence interval. These ex-ante 'income' effects are statistically significant at very young ages (4-7) and then again around ages 11-13 (this is where the lower confidence bound is either above or close to 0), precisely where we see the turning point in the enrollment graph above. There does seem to also be an income effect around age 17 but we do not have enough children in our sample at this age nor do we believe these households with children age 17 to be entirely representative of the program target population.

Figure 3. Relationship between total household per capita consumption and school enrollment by age

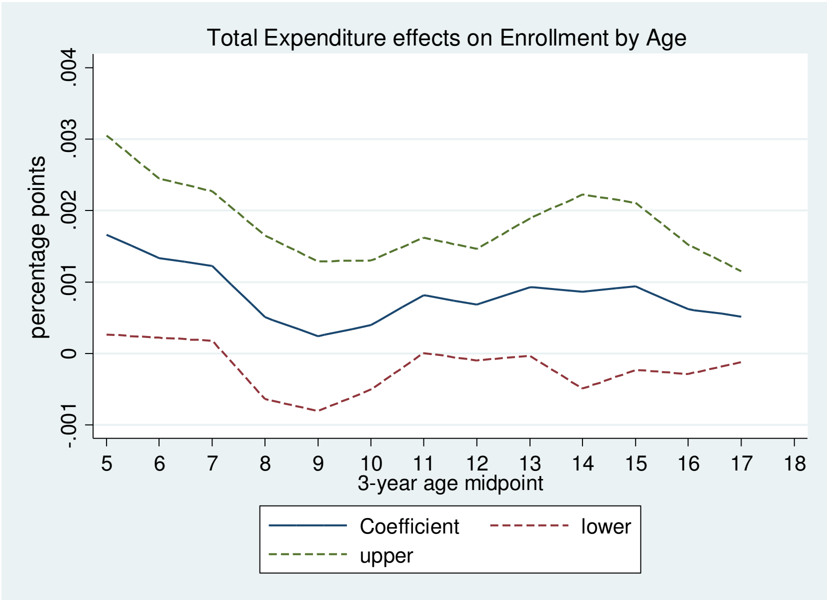
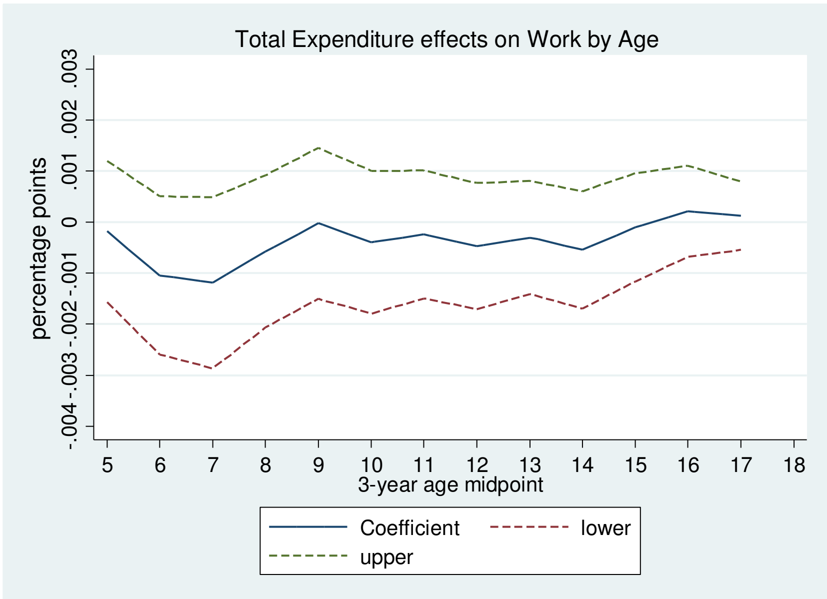


Figure 4. Relationship between total household per capita consumption and work by age



In contrast the 'income' effects for work shown in Figure 4 are never significantly different from 0 (confidence bounds include 0) which is consistent with what we suggested above, which is that the program is unlikely to have any measureable impact on child work.

Based on this ex-ante analysis using baseline data, we hypothesize that the CGP has the 'best chance' of impacting school enrollment at very young ages and then in the age band where drop-out begins to occur. It is unlikely to have any impact on child work, both because estimated income effects are not significant and because the target population has few children in the age range of interest for child labor. In the analysis below, we therefore focus our analysis on children age 4-14 as we have few kids over age 14, and those that we have are not representative of typical CGP households. We also stratify our analysis into ages 4-7, 8-10, and 11-14 as the ex-ante analysis suggests that the CGP imapcts are likely to be bigger in the first and last of these groups but not the middle group.

The actual model we estimate is a multivariate difference-in-differences (DD) controlling for a select number of covariates (described below) that are all measured at baseline.

Econometric Specification: Difference-in-difference estimates of enrollment and child labour

Similar to Skoufias and Parker (2001), we estimate the following regression equation for schooling and child labour separately:

Eq. (1)

$$Y(i,t) = \alpha + \beta_T T(i) + \beta_{R2}(R2) + \beta_{R3}(R3) + \beta_{TR2}(T(i) * R2) + \beta_{TR3}(T(i) * R3) + \sum_{j=1}^{J} \theta_j X_j(i,t) + \varepsilon(i,t)$$

$Y(i,t)$ is the the outcome indicator (either schooling or child labour) for individual child i at time t. It basically captures whether the child i is enrolled in school at time t or whether the child i is involved in some sort of work at time t; $T(i)$ is a dummy variable indicating treatment status; R2 and R3 are dummy variables for the two time periods considered; R2 refers to the 24-month follow up, whereas R3 merge together the 30- and 36-month follow-ups given these data refer to the same academic/schooling year; β_{TR2} and β_{TR3} capture the treatment effect at time 2 and 3; X is a set of control variables; ε is the error term.

We model schooling and child labour as a function of the same set of control variables including: 1) child characteristics (age, age squared and gender); 2) household characteristics (age of recipient, marital status of recipient, whether the recipient has ever attended school, log of household size, a set of dummies capturing household composition, district dummies, log of consumption per capita, average men, women and children wages at CWAC level, log of distance to food market); 3) school infrastructural characteristics (proximity to school is captured by the log of the average time spent to reach school at CWAC level; and 4) a vector of cluster level prices. Means for these variables are presented in Table A1 of the Appendix.

Based on the previous analysis, we estimate Eq. (1) over three age groups, namely the younger age group (4-7), the mid-age group (8-10) and the older-age group (11-14). The same age groups are used for work and enrollment for consistency. For each age group we run four slightly different specifications depending on the sample selected. Indeed, there are different ways to study these age group. Hereafter, we briefly describe the major differences across the four samples used.

For each age group we use four slightly different samples and we therefore end up with four specifications for each age group: 1) pooled cross-sections, 2) cohort; 3) unbalanced panel; and 4) (balanced) panel. Let's consider how these four samples vary when we study, for instance, the younger age group (4-7).

The *pooled cross-sections* consist of children age 4-7 in each wave; this means that we are not following the same children across waves as children drop out of the sample as they age. The last three samples are more similar across them. The (balanced) *panel* is the strongest estimator: basically we are looking at the sample of children 4-7 at baseline who are inteviewed at each of the following wave; these kids turn 7 to 10 at wave 3 and 4 and have all had the same exposure (i.e. complete exposure) to the program. These are exactly the same kids in each wave. The *unbalanced panel* encompasses children 4-7 at baseline (or 6-9 at 24-month, or 6-11 at 30-/36-month) who are inteviewed in at least two waves. The unbalanced panel allows to retain more kids/observations with respect to the panel but introduce some heterogeneity as kids have not been exposed equally to the program; for this reason, it is considered to be less strong than the panel. The *cohort* sample includes at baseline all children 4-7; at 24-month all children 6-9, at 30-/36-month all children 6-11. It is very similar to the unbalanced panel but also includes those children that move in and out of the survey and that therefore might have been interviewed only once. As a conquence the sample size of the cohort is higher than the unbalanced panel, that is in turn higher than the (balanced) sample.

6 Results

6.1 Descriptive statistics

6.1.1 Cross-section

In this section we describe how enrollment and child labour participation have been changing over time, namely across waves, for children in the treated and in the control group separately. This allows to provide some *prima facie* evidence of the impact of the cash transfer on enrollment and child labour. In particular, it helps defining and confirming the age groups where we expect to find an impact and the time (or wave) at what this impact shows up or the time at which the impact is stronger.

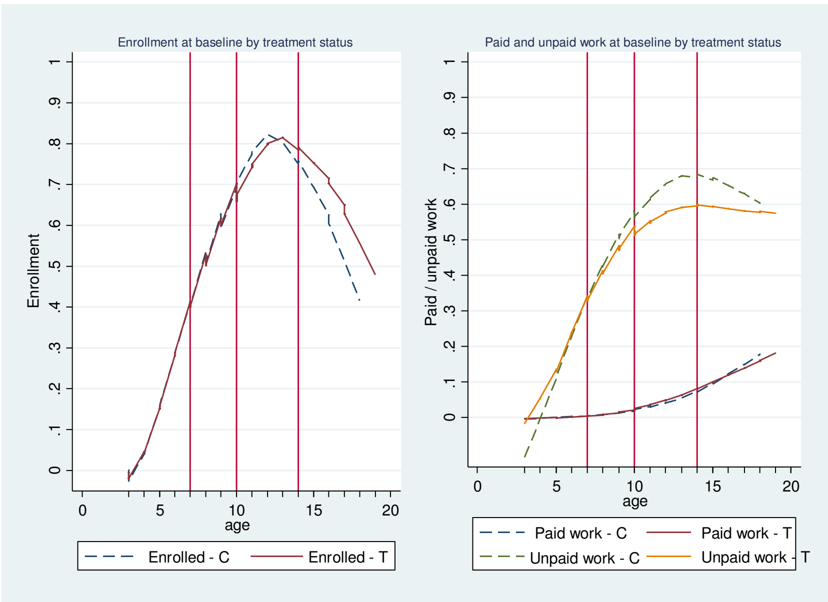
In order to do so, we show a number of *curves* that depict the relationship between enrollment/paid work/unpaid work and age for each wave by treatment status (Figures 5 to 8). These curves are obtained through a smoothing procedure called *lowess* (robust locally weighted regression). In order to provide a fuller picture of changes in enrollment and child labour participation by treatment group over time, enrollment and work activity by age groups are also reported in Table 2 to Table 5 at the end of this section. These statistics, namely *means by treatment and control group*, are useful to complement the visual analysis, namely the lowess graphs. It is important to notice that these figures and tables refer to what was previously referred to as '*cross-section sample'*. As an example, the 4-7 cross-section sample is basically composed by all children aged 4 to 7 at each single wave; these are not the same group of children in each wave as children move out of the sample as they age.

<u>Baseline</u>

In terms of e*nrollment*, the panel on the left of Fig. 5 shows a steady increase in enrollment with age up until 12-13 years old when it then decreases sharply (inverse U-shape). At baseline, around 17 per cent of children aged 4 to 7 go to school compared to around ¾ of children aged 8 to 10. This percentage increases even more for the older age group under analysis (11-14) reaching around 85 per cent (see first column of Table 2). The figure also allows to check whether treatment and control group are balanced at baseline; whether no concerns are raised for the younger age groups, some might be raised for the 11-14 age group (indeed, Table 2 shows almost 3 pp difference at baseline on average for this age group: 86 per cent and 89 per cent for the treated and control group respectively).

As for what concerns *child labour,* panel on the right of Fig. 5, paid and unpaid work are distinguished. As expected, patterns for these types of labour participation vary. Indeed, on one hand, *paid work* is almost inexistent at lower ages, whereas participation rates seem to increase more sharply at 10-11 years old. Indeed, Table 3 (first column) shows that participation in paid work is 0.1/0.2 per cent for children aged 4 to 7; it increases for the mid-age group (8 to 10) although it is still lower than 1 percent and then it reaches 4/5 per cent for the older, 11-14, age group. On the other hand, *unpaid work* increases sharply up until 12-13 year old and then decreases slightly as children grow older. The graph shows that there seems to be a switch between unpaid and paid work at 12-13 that is also the drop-out age. Indeed, as shown in Tables 4 and 5, around a quarter of the younger age group (4-7) is involved in some sort of work ('any work'); most of this percentage is driven by unpaid work (23/24 per cent). Children in the mid-age group (8 to 10) are much more likely to be involved in some work - around 54 per cent and 58 per cent of children in the treated and control group respectively; again most can be accounted for by unpaid work (52 per cent and 56 per cent respectively for the control and treatment group). Finally, around 6 or 7 out of 10 children are involved in some sort of work in the older (11-14) age group; there is a fairly lower participation in unpaid work for the treated group in this age group that might be the reason of balancing concerns at baseline (unpaid work is at 68 per cent vs 60 per cent for treated and control group respectively).

Fig. 5 – Enrollment and work by treatment status at baseline



<u>24 month</u>

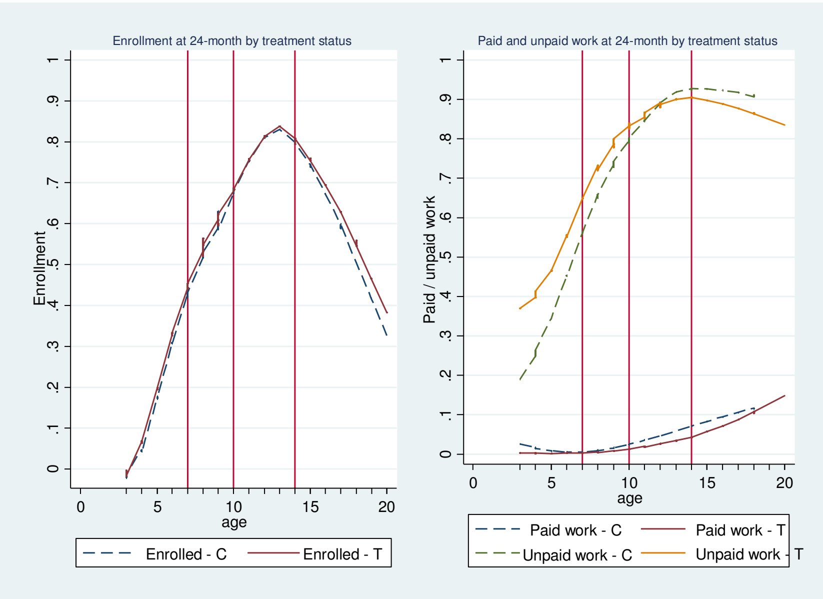
Figure 6 shows how enrollment (panel on the left) and labour participation (panel on the right) evolved two years later. The more distant the treatment and the control groups lines are, the larger the impact (positive or negative) expected.

Starting from the panel on the left, the graph does not lend support for any significant impact on enrollment for any of the age group under analysis. The statistics in Table 2 shows that enrollment rates for the age group 4-7 are lower than at baseline and more so for the control (13 per cent vs 17 per cent) than for the treated group (16 per cent vs 17 per cent), with around +3 pp estimated DiD. The mid- and older- age groups are slightly higher at 24th month than at basleine, but there seem to be no major difference between the treatment and control group (around 77/78 per cent for 8-10 year and 90/91 per cent for 11-14 years).

The panel on the right of Figure 6 shows some positive impact for what concerns paid work, mostly in the 11-14 age group. Indeed, Table 3 indicates that at 24-month 5 per cent of older children (11 to 14) were involved in paid work compared to the lower percentage, 3 per cent, in the treated group. For both the 4-7 and 8-10 age groups, paid work increased more for the control group or decreased more for the treated group, however, there do not seem to be large differences.

For both treated and control, *unpaid work* seems to be much higher than at baseline; around the double for the 4-7 age group (from 23 per cent to 42 per cent in the control group and 24 per cent to 51 per cent in the treatment group) and a 20-30 pp increase for the 8-10 age group (from 56 per cent to 77 per cent in the control group and 52 per cent to 84 per cent in the treatment group). Indeed, *unpaid work* seems to be higher in the treatment for the two younger age groups. This pattern is inverted for the older age group 11-14; on average around 92 per cent of children in the control group is involved in unpaid work.

Fig. 6 – Enrollment and work by treatment status at 24-month



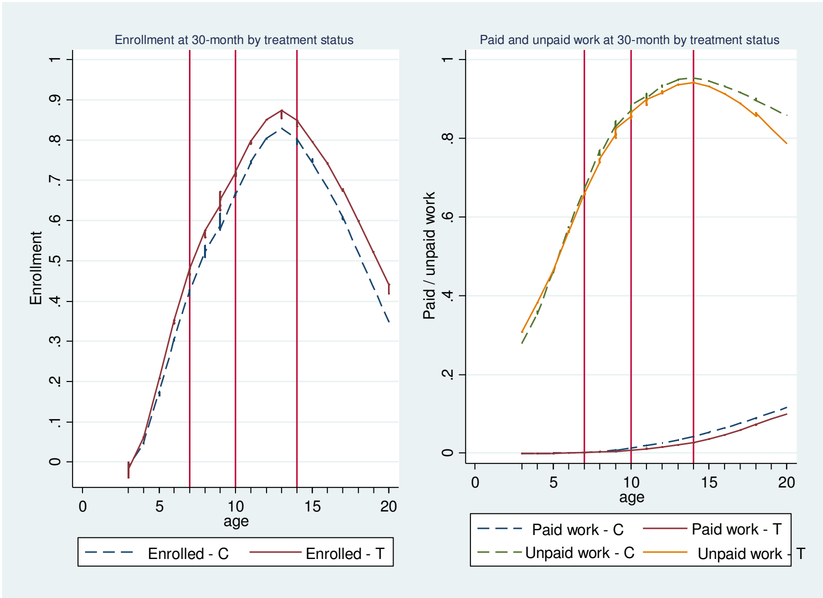
30 month

Based on the left panel of Figure 7, a positive impact on enrollment is expected for all age groups; indeed the red line is consistently higher than the blue dotted line.

At 30th month, 19 per cent of 4-7 children are in school compared to 16 per cent in control group ; a similar pattern is found for the 8-10 age group: 84 per cent of children go to school in the treatment group with respect to 77 per cent in the control group. The largest positive impact for the 11-14 age group is recorded at 30 month: whereas 93 per cent of treated children are in school, only 90 per cent of control children are.

From the right panel of Figure 7, a positive impact is expected for the 11-14 age group for *paid work*, indeed the red solid line consistently lower than blue dashed line. Even though at 30-month paid work decreased for both the treated and the control group, it dropped more for treated children. Indeed, Table 3 (3rd column) shows that only 1 per cent of children in the treated group are involved in some sort of paid work compared to 3 per cent in the control group. As for *unpaid work*, there seem to be a positive impact although possibly not significant: the solid yellow line is consistently below the dashed green one however, the two lines are very close to each other. A general pattern that appears from Table 4 (3rd column) is that the participation in unpaid work has kept increasing for both the treated and the control group and at 30-month it is higher than at 24-month and at baseline.

Fig. 7 – Enrollment and work by treatment status at 30-month

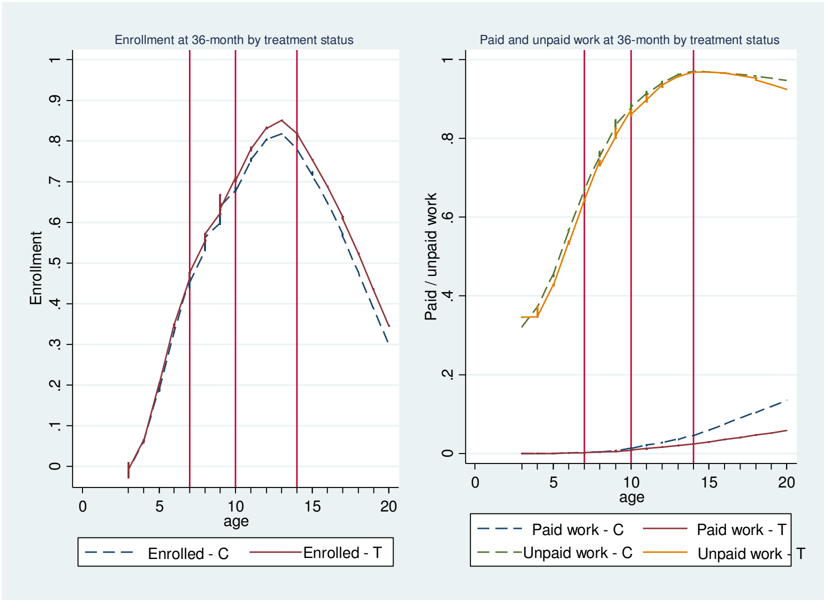


<u>36 month</u>

The left panel of Fig. 8 (enrollment) shows that the red solid line is consistently higher than the blue dotted line for the older age group and also, even though the difference is less apparent, for the 8-10 age group. The gap however is small and might not be statistically significant. Table 2 indicates a 2 pp improvement for both the treatment and the control group over three years (from around 17 to around 19). For the age group 8-10, the difference between the treated and the control seems to be disappearing. Similarly for the 11-14 age group, at 30-month a higher percentage of children attend school in the treated group with respect to the control; this gap seems to be decreasing slightly at 36-month.

Paid and unpaid work are shown in the right panel of Figure 8. A positive impact for the 11-14 age group might be expected: indeed the red solid line is consistently lower than blue dashed line. Table 3 indicates that children in the control and treatment group have participation rates in paid work similar to those recorded in wave 3. Indeed, in the next section, the ability of the CT in reducing participation in paid work for the older age group (11-14) will be tested. No impact is expected for *unpaid work* as the treated and control lines are very close to each other. Table 4 shows an average enrollment of 97 per cent for both the control and the treated group.

Fig. 8 – Enrollment and work by treatment status at 36-month



To sum up, this initial cross-section descriptive statistics shows that, with regards to enrollment, an impact should be expected at 30-month for all age groups and 36-month for the older age group (11-14). In terms of work, some impact, if any, might be expected for the older 11-14 age group for paid work starting from the second wave and up to the fourth one; no impact overall for unpaid work even though at 24-month we noticed a possible negative impact on unpaid work for the younger 2 age group. Some concerns about treatment and control balancing were raised especially for what concerns unpaid work for the older age group; these will be confirmed, or not, in the following section.

Table 2: Mean enrollment rates (Cross section)

Treatment status	Baseline	24-month	30-month	36-month
		4-7 years		
Control	*17.3*	*13.3*	*16.0*	*19.3*
N	1139	1224	1491	1576
Treated	*17.1*	*16.0*	*19.0*	*19.4*
N	1124	1184	1464	1542
		8-10 years		
Control	*73.3*	*76.9*	*77.0*	*81.4*
N	667	666	702	721
Treated	*76.3*	*77.9*	*84.1*	*84.6*
N	636	669	704	749
		11-14 years		
Control	*88.6*	*91.6*	*89.6*	*88.6*
N	595	682	801	838
Treated	*86.0*	*90.3*	*93.1*	*91.9*
N	628	679	736	774

Table 3: Paid work participation rates (Cross section)

Treatment status	Baseline	24-month	30-month	36-month
		4-7 years		
Control	*0.2*	*0.5*	*0.1*	*0.0*
N	830	797	1026	1132
Treated	*0.1*	*0.1*	*0.0*	*0.0*
N	822	773	949	1045
		8-10 years		
Control	*0.9*	*1.1*	*0.3*	*0.6*
N	660	655	699	721
Treated	*0.8*	*0.5*	*0.4*	*0.4*
N	628	652	703	749
		11-14 years		
Control	*3.9*	*4.6*	*2.8*	*2.5*
N	590	674	794	836
Treated	*5.3*	*2.6*	*1.1*	*1.6*
N	619	663	734	770

Table 4: Unpaid work participation rates (Cross section)

Treatment status	Baseline	24-month	30-month	36-month
		4-7 years		
Control	*23.0*	*41.8*	*54.5*	*54.0*
N	830	800	1027	1136
Treated	*24.0*	*50.9*	*53.6*	*50.7*
N	822	778	951	1045
		8-10 years		
Control	*55.9*	*77.4*	*89.3*	*89.2*
N	660	658	701	721
Treated	*52.2*	*84.0*	*86.1*	*87.7*
N	628	657	704	749
		11-14 years		
Control	*67.7*	*92.2*	*96.3*	*97.4*
N	590	679	795	836
Treated	*60.2*	*91.6*	*96.0*	*96.8*
N	619	668	734	770

Table 5: Any work participation rates (Cross section)

Treatment status	Baseline	24-month	30-month	36-month
		4-7 years		
Control	*24.6*	*43.9*	*56.4*	*53.9*
N	830	797	1026	1132
Treated	*25.8*	*53.8*	*55.7*	*51.2*
N	822	773	949	1045
		8-10 years		
Control	*58.3*	*79.9*	*90.7*	*90.4*
N	660	655	699	721
Treated	*54.1*	*86.3*	*87.6*	*88.0*
N	628	652	703	749
		11-14 years		
Control	*72.3*	*93.9*	*98.5*	*97.6*
N	590	674	794	836
Treated	*66.3*	*94.7*	*97.4*	*97.9*
N	619	663	734	770

6.1.2 Cohort

As already highlighted in the specification section, there is another way to cut the data. Reported below are the tables of means for enrollment and work by treatment status for each of the four waves and for each age group for the cohort rather than for the cross-section sample. As can be noticed the pattern in Tables 6 to 9 is fairly different than the one observed in the cross-section descriptive stats as now the kids under analysis age across waves.

Indeed, focusing on the *4-7 age group cohort*, there is now a big jump in *enrollment* for both the treatment and the control group between the baseline and the 24-month from 17 per cent to around 52 per cent. This simply reflects the fact that as young children age (and turn from 4-7 at baseline to 6-9 at 24-month) into school age their probability to attend school increase. At 30-month enrollment is almost 8 points higher for treated than for control children (71 per cent vs 63 per cent). At 36-month, the gap between the treated and the control seems to close down as the control group catches up; there is however still a higher percentage of children enrolled in the control group than in the treated one (72 per cent vs 70 per cent). *Paid work is* basically inexistent for this age group (4-7 at baseline and 7-10 at 36-month). There is a huge jump in the participation in *unpaid work* (and therefore 'any work') from baseline to the 24-month and then to 30-month.

Focusing now on the *8-10 age group*, there is again a large increase in *enrollment* at 24-month for both the treatment and the control group as children age 10-12 year old (from around 75 per cent to around 90 per cent); then enrollment remains relatively stable or decreases slightly for the control group whether it keeps increasing slightly for the treated group. Participation in *paid work* is fairly low at baseline – lower than 1 percent - but increases at 24-month (as children grow older) more for the control (4 per cent) than for the treated group (1 per cent). At 30-month it is still higher for the control group (2 per cent vs 1 per cent) but the difference seem to disappear at 36-month. *Unpaid (or any) work* increased for both control and treated children with a huge increase at 24 month (from around 55 per cent to around 90 per cent); however, there does not seem to be any impact at any wave.

Turning to the *11-14 age group*, the pattern is now opposite to what recorded for the younger age groups. Indeed, as kids grow up (throughout waves), the *enrollment* rate tends to decrease and more so for the control group than for the treated one. The gap between the treated and the control group keeps increasing over time: 3 pp at 24 mth, 5 pp at 30 month and 6 pp at 36 month. Participation in *paid work* increases more over time for the control group whereas it decreases for the treated group. Here, notwithstanding the possible balancing problem at baseline, (namely labour participation is higher in the treated group), there is a large positive impact that increases over time reaching a difference of 3.4 pp between the treatment and control group at 36 month. In terms of unpaid work, counterintuitively, unpaid work seems to be increasing more for the treated than for the control group although some concerns might be raised in terms of balancing at baseline.

Table 6: Mean enrollment rates (Cohort)

Treatment status	Baseline	24-month	30-month	36-month
		<u>4-7 years</u>		
Control	*17.3*	*51.1*	*62.8*	*70.1*
N	1139	973	1082	1107
Treated	*17.1*	*52.7*	*70.5*	*71.9*
N	1124	978	1066	1110
		<u>8-10 years</u>		
Control	*73.3*	*90.1*	*88.9*	*88.9*
N	667	585	638	658
Treated	*76.3*	*92.0*	*92.9*	*93.3*
N	636	550	603	609
		<u>11-14 years</u>		
Control	*88.6*	*82.8*	*80.2*	*74.5*
N	595	501	566	573
Treated	*86.0*	*85.6*	*85.0*	*80.3*
N	628	530	581	588

Table 7: Paid work participation rates (Cohort)

Treatment status	Baseline	24-month	30-month	36-month
		<u>4-7 years</u>		
Control	*0.2*	*0.3*	*0.2*	*0.5*
N	830	963	1073	1100
Treated	*0.1*	*0.3*	*0.3*	*0.2*
N	822	949	1061	1110
		<u>8-10 years</u>		
Control	*0.9*	*3.6*	*2.5*	*1.8*
N	660	577	630	654
Treated	*0.8*	*1.5*	*0.8*	*1.5*
N	628	539	601	605
		<u>11-14 years</u>		
Control	*3.9*	*7.1*	*4.7*	*6.2*
N	590	494	557	559
Treated	*5.3*	*4.1*	*3.2*	*2.8*
N	619	514	573	573

Table 8: Unpaid work participation rates (Cohort)

Treatment status	Baseline	24-month	30-month	36-month
		4-7 years		
Control	*23.0*	*62.1*	*80.8*	*83.2*
N	830	966	1074	1102
Treated	*24.0*	*70.0*	*78.4*	*80.1*
N	822	957	1063	1110
		8-10 years		
Control	*55.9*	*89.5*	*96.3*	*96.5*
N	660	581	631	654
Treated	*52.2*	*91.5*	*95.8*	*96.5*
N	628	544	601	605
		11-14 years		
Control	*67.7*	*93.3*	*94.8*	*98.2*
N	590	496	558	559
Treated	*60.2*	*91.1*	*95.1*	*97.6*
N	619	519	573	573

Table 9: Any work participation rates (Cohort)

Treatment status	Baseline	24-month	30-month	36-month
		4-7 years		
Control	*24.6*	*64.2*	*82.6*	*84.0*
N	830	963	1073	1100
Treated	*25.8*	*72.8*	*80.1*	*80.4*
N	822	949	1061	1110
		8-10 years		
Control	*58.3*	*91.5*	*98.6*	*96.8*
N	660	577	630	654
Treated	*54.1*	*93.5*	*97.0*	*97.5*
N	628	539	601	605
		11-14 years		
Control	*72.3*	*94.9*	*98.7*	*98.6*
N	590	494	557	559
Treated	*66.3*	*94.9*	*97.9*	*98.6*
N	619	514	573	573

6.2 The impact of CGP on schooling and work

In this section, the econometric results of enrollment and work are discussed together by age group: 4-7; 8-10; and 11-14. The specifications and estimators are those discussed in Section 5; indeed, we report the results for four samples (pooled cross-sections; cohort; unbalanced panel and finally [balanced] panel). We consider three time periods and estimate the impact at 24^{th} month (two years impact) and the average impact after 3 years computed as the difference between treated and control groups from baseline to the 30 and 36 month average (namely the three year impact average). For child labour, only results for 'any work' are reported given the low participation rates in paid work and given the fact that it captures both paid and unpaid work (although it is mainly driven by the latter especially for the two lower age groups). However, results for paid work are reported for the older age group given their higher participation.

6.2.1 Age group 4-7

The results on *enrollment* for the 4 to 7 age group are reported in Table 10. For the cohort, unbalanced and (balanced) panel, the sample consists of 4 to 7 children at baseline that reach school-entry age in the last 2 waves (namely they turn 6/7 to 10 in the fourth wave).

The results confirm a large and significant impact around 5-6 pp after three years (Wave 3/4). For the 4-7 age group the average third year impact is +5.5, +5.4 and +6.4 for the cohort, unbalanced and balanced panel respectively. The only specification where no significant treatment effect is recorded is the pooled cross-section. The absence of impact in specification (1) might be related to the exposure to the programme; namely, cohort and panel kids are exposed for longer to the programme.

The results on *child labour (any work)* for the 4 to 7 age group are reported in Table 11. Notwithstanding the subsample used there seem to be no impact on child labour as it could have been expected according to the initial descriptive statistics.

Table 10: Impact of CGP on enrollment

Age group 4-7

VARIABLES	(1) Pooled Cross-section	(2) Cohort	(3) Unbalanced panel	(4) Panel
Treated	-0.0171	-0.0335	-0.0328	-0.0473
	(-0.81)	(-1.47)	(-1.40)	(-1.80)
DD Wave 2	*0.0354*	0.0272	0.0261	0.0468
	(1.64)	(0.93)	(0.89)	(1.50)
DD Wave 3/4	0.0233	**0.0549**	**0.0538**	**0.0636**
	(1.13)	(2.03)	(1.99)	(2.07)
Observations	10,554	8,412	8,282	6,654
R-squared	0.218	0.335	0.335	0.356

Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for a set of control variables including child's gender and age, household size, recipient's age, education and marital status, districts, household demographic composition, proximity to primary school and food market, and a vector of cluster-level prices.

Table 11: Impact of CGP on any work

Age group 4-7

VARIABLES	(1) Pooled Cross-section	(2) Cohort	(3) Unbalanced panel	(4) Panel
Treated	0.00655	0.000663	0.00490	0.00683
	(0.16)	(0.02)	(0.13)	(0.18)
DD Wave 2	0.0833	0.0671	0.0620	0.0651
	(1.42)	(1.35)	(1.23)	(1.23)
DD Wave 3/4	-0.0349	-0.0379	-0.0412	-0.0491
	(-0.67)	(-0.85)	(-0.92)	(-1.07)
Observations	7,239	7,747	7,651	6,172
R-squared	0.124	0.289	0.287	0.279

Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for a set of control variables including child's gender and age, household size, recipient's age, education and marital status, districts, household demographic composition, proximity to primary school and food market, and a vector of cluster-level prices.

6.2.2 Age group 8-10

The results on *enrollment and child labour (any work)* for the 8 to 10 age group are reported in Tables 12 and 13. In neither case, we find any statistically significant impact notwithstanding the subsample used.

Table 12: Impact of CGP on enrollment

Age group 8-10

VARIABLES	(1) Pooled Cross-section	(2) Cohort	(3) Unbalanced panel	(4) Panel
Treated	0.00913	0.0209	0.0329	0.0281
	(0.31)	(0.66)	(1.02)	(0.79)
DD Wave 2	-0.0135	-0.0197	-0.0330	-0.0285
	(-0.34)	(-0.54)	(-0.90)	(-0.74)
DD Wave 3/4	0.0189	-0.00134	-0.0167	-0.00718
	(0.54)	(-0.04)	(-0.50)	(-0.20)
Observations	5,407	4,898	4,809	3,774
R-squared	0.087	0.094	0.095	0.111

Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for a set of control variables including child's gender and age, household size, recipient's age, education and marital status, districts, household demographic composition, proximity to primary school and food market, and a vector of cluster-level prices.

Table 13: Impact of CGP on any work

Age group 4-7

VARIABLES	(1) Pooled Cross-section	(2) Cohort	(3) Unbalanced panel	(4) Panel
Treated	-0.0297	-0.0247	-0.0210	-0.0242
	(-0.60)	(-0.49)	(-0.41)	(-0.46)
DD Wave 2	0.0852	0.0471	0.0398	0.0364
	(1.53)	(0.85)	(0.72)	(0.64)
DD Wave 3/4	-0.00538	0.0204	0.0166	0.0231
	(-0.10)	(0.39)	(0.31)	(0.42)
Observations	5,362	4,853	4,766	3,745
R-squared	0.167	0.285	0.282	0.273

Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for a set of control variables including child's gender and age, household size, recipient's age, education and marital status, districts, household demographic composition, proximity to primary school and food market, and a vector of cluster-level prices.

6.2.3 Age group 11-14

The results on *enrollment, any work and paid work* for the 11 to 14 age group are reported in Table 14, 15 and 16 respectively. For cohort, balanced and unbalanced panel, the sample is that of 11-14 year old at baseline, basically those in secondary school (transition) age, that turn 14-17 at 36-month. The 'treated' variable in each of these tables is not statistically significant meaning that we can get rid off our initial concern: there is no difference at baseline between the treatment and control group once we control for a set of regressors.

A large and statistically significant impact for *enrollment* is recorded on average in the 3rd year after baseline for all specifications (ranging from 6 to 9 pp)[21]. The largest impact is for the cohort and unbalanced panel at time 3 (wave 3 and 4 average) (around 9 pp). These results basically confirm what we observed in the lowess graphs and descriptive statistics earlier on. This is also consistent with available literature that finds larger impacts at older age groups and for girls. For instance, Sadoulet et al. (2004) found that Progresa/Oportunidades's impact on schooling among children aged 8 to 17 was greater at secondary than primary school level (Mexico). They also found that the impact was larger for girls than boys. Skoufias and Parker (2001) found the largest impacts on use of time for children aged 12 plus, i.e. those of secondary school age. They found a larger impact on school participation by girls than boys, at almost double the impact (Progresa/Oportunidades - Mexico).

Table 14: Impact of CGP on enrollment

Age group 11-14

VARIABLES	(1) Pooled Cross-section	(2) Cohort	(3) Unbalanced panel	(4) Panel
Treated	-0.0355	-0.0480	-0.0480	-0.0257
	(-1.41)	(-1.82)	(-1.76)	(-0.95)
DD Wave 2	0.00638	*0.0576*	*0.0538*	0.0299
	(0.25)	(1.89)	(1.80)	(0.97)
DD Wave 3/4	**0.0567**	**<u>0.0921</u>**	**<u>0.0923</u>**	*0.0566*
	(2.48)	(3.48)	(3.48)	(1.93)
Observations	5,702	4,548	4,425	3,375
R-squared	0.034	0.070	0.072	0.082

Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for a set of control variables including child's gender and age, household size, recipient's age, education and marital status, districts, household demographic composition, proximity to primary school and food market, and a vector of cluster-level prices.

No impact is detected when we look at the impact on participation in *any work* (paid and/or unpaid). However, for this age group we disaggregate the results to show paid work: results indicate a significant reduction in participation in paid work around 4 pp 2 and 3 years after. Again, these results seem to be in line with existing literature that finds that older rather than younger children, (and boys rather than girls), showed the largest impacts (as they are the most likely to be working). Again the absence of impact in the pooled cross-section (specification 1) might be related to the exposure to the programme;

[21] The only exception is the treatment effect at 36th month is not significant for the panel sample.

namely, cohort and panel kids are exposed for longer to the programme and these are also the kids where impact is statistically significant.

Table 15: Impact of CGP on any work

Age group 11-14

	ANY WORK			
	(1)	(2)	(3)	(4)
VARIABLES	Pooled Cross-section	Cohort	Unbalanced panel	Panel
Treated	-0.0579	-0.0580	-0.0498	-0.0337
	(-1.22)	(-1.26)	(-1.06)	(-0.64)
DD Wave 2	0.0655	0.0541	0.0495	0.0381
	(1.20)	(1.01)	(0.92)	(0.64)
DD Wave 3/4	0.0552	0.0572	0.0493	0.0345
	(1.13)	(1.21)	(1.02)	(0.63)
Observations	5,649	4,467	4,344	3,329
R-squared	0.185	0.203	0.195	0.206

Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for a set of control variables including child's gender and age, household size, recipient's age, education and marital status, districts, household demographic composition, proximity to primary school and food market, and a vector of cluster-level prices.

Table 16: Impact of CGP on paid work

Age group 11-14

	PAID WORK			
	(1)	(2)	(3)	(4)
VARIABLES	Pooled Cross-section	Cohort	Unbalanced panel	Panel
Treated	0.00983	0.0132	0.0131	0.00365
	(0.70)	(0.94)	(0.86)	(0.21)
DD Wave 2	*-0.0315*	**-0.0395**	**-0.0380**	-0.0220
	(-1.91)	(-2.06)	(-1.99)	(-1.06)
DD Wave 3/4	*-0.0273*	**-0.0401**	**-0.0415**	*-0.0387*
	(-1.67)	(-2.15)	(-2.20)	(-1.88)
Observations	5,649	4,467	4,344	3,329
R-squared	0.020	0.026	0.027	0.031

Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for a set of control variables including child's gender and age, household size, recipient's age, education and marital status, districts, household demographic composition, proximity to primary school and food market, and a vector of cluster-level prices.

6.3 Sensitivity analysis

We also re-estimated the above models using four waves (time periods), rather than averaging the 30- and 36-month together. Results using the baseline, 24-, 30- and 36-month follow-ups are consistent with those previously shown for all age groups. The only exception is for children 4-7.

Table 17 below reports results for children 4 to 7.

Table 17: Impact of CGP on enrollment

Age group 4-7

	(1)	(2)	(3)	(4)
VARIABLES	Pooled Cross-section	Cohort	Unbalanced panel	Panel
Treated	-0.0172	-0.0334	-0.0327	-0.0470
	(-0.82)	(-1.46)	(-1.40)	(-1.78)
DD Wave 24	0.0360	0.0282	0.0270	0.0473
	(1.66)	(0.96)	(0.92)	(1.51)
DD Wave 30	0.0379	**0.0809**	**0.0789**	**0.0889**
	(1.79)	(2.95)	(2.90)	(2.80)
DD Wave 36	0.00932	0.0279	0.0279	0.0366
	(0.42)	(0.96)	(0.95)	(1.14)
Observations	10,554	8,412	8,282	6,654
R-squared	0.218	0.335	0.335	0.357

Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for a set of control variables including child's gender and age, household size, recipient's age, education and marital status, districts, household demographic composition, proximity to primary school and food market, and a vector of cluster-level prices.

The results indicate a large and significant impact around 8 pp at 30-month that then disappears at 36-month. Based on the descriptive statistic provided earlier, a catch-up effect could be hypothesized. Based on the cohort descriptive statistics (Table 6) enrollment is around 8 points higher for treated children (71% vs 63%); at 36th month though the control group catches up (although still a higher percentage of children in the control group are enrolled 72 per cent vs 70 per cent). It should be recalled that both 30-month and the 36-month observations are gathered during the same (academic) year. There might be a story about treatment kids being able to start school at the beginning of the academic year while control kids can only start later on in the academic year. Such hypothesis was supported by a number of enumerators during fieldwork in Lusaka but it should be tested further.

6.4 The impact of CGP on school inputs

As already discussed in Section 4 (Zambian Educational System), there are a number of potential barriers in access to education. The major constraints are primarily economic. Indeed, due to financial constraints, households might not be able to pay for formal or informal school fees or cover other costs such as transportation, uniforms and shoes, or other school equipment (stationary). These costs tend to be higher for secondary school age children (Kenya CT-OVC Evaluation Team, 2012). Moreover, households might be reliant on child labour and unable to give up their contribution. Physical distance represents another major hurdle to enrollment as kids often have to walk long distances to get to school. Finally, barriers to school access tend to affect girls disproportionately.

Therefore, for all these reasons, households might be unable to send their children to school. The provision of an unconditional cash transfer has the potential to alleviate some of these barriers that inhibit educational access. In this section, we try to explain the potential pathways through which the unconditional cash transfer impacts on enrollment.

Survey instruments allow to investigate whether the program alleviate any of these barriers. Indeed, for each child enrolled the survey collects detailed data on individual *expenditures on education* in the current school year. Education expenditures include fees, uniform, transport, stationary and books, PTA levy and any other as reported by respondent. A major barrier to schooling is represented by *uniforms*. Indeed, children who cannot afford uniforms often suffer form peer pressure and stigma, this might increase absenteism and drop out. Moreover, for every child aged 5 to 18, enrolled or not, we also have data on whether they have a *pair of shoes*. Indeed, children under analysis live in really remote areas and sometimes they cannot get to and/or attend school as they do not have shoes: they have to walk long distances or shoes are required; indeed, shoes ownership can enable children to walk far distances on rough terrains protecting feet from cuts and infections and preventing diseases such as worms.

We use available survey data to form the basis for a series of estimations in this section. Indeed, we estimate a DiD Pooled Cross-Section to see whether education and uniform expenditures, or the probability of owning a pair of shoes is higher for children in the treatment group with respect to those in control areas. If this were the case, we would have some basis to hypothesize that the enrollment increase reported in the previous sections has happened through an increase in a set of expenditures related to attendance that households are now able to afford.

Results for education and uniforms expenditures (log of) are reported in Table 18, whereas results for (ownership of) shoes are reported in Table 19. In each table we report results for all children age 4-14 and also for the older age group 11-14. In table 18, namely for education expenditures and uniforms, we estimate only on the sample of children who attend school as this set of information is collected only for enrolled children. The shoes regression is estimated also on the full sample of school-age children (either enrolled or not).

Education expenditures are 33 percentage points higher for treated children than for their control peers after two years when we focus on children 4 to 14. The impact however is not significant anymore three years after baseline (see Table 18, Panel A).

A significant differential impact is also reported for uniforms (see Table 18, Panel B). Uniforms expenditures for children 4-14 in treated households increased by 60 percentage points after 2 years and after three years the impact is still statistically significant even though the coefficient is smaller but still extremely high (around 45 percentage points).

Table 18: Impact of CGP on education and uniform expenditures (log) by age group (pooled cross-section)

	Panel A: Education expenditures		**Panel B: Uniform expenditures**	
VARIABLES	Age group 4-14	Age group 11-14	Age group 4-14	Age group 11-14
Treated	-0.0966	-0.0668	-0.112	-0.101
	(-0.69)	(-0.39)	(-0.97)	(-0.68)
DD Wave 2	**0.335**	0.276	**0.605**	**0.526**
	-2.32	-1.48	-4.68	-2.82
DD Wave 4	0.23	0.247	**0.447**	**0.478**
	-1.43	-1.33	-2.43	-2.09
Age	**-0.261**	-2.07	**-0.28**	-1.694
	(-5.90)	(-1.47)	(-4.92)	(-1.08)
Age-squared	**0.0143**	0.0843	**0.0128**	0.0677
	-6.55	-1.55	-4.58	-1.12
Female	-0.00578	-0.0279	0.0387	0.0128
	(-0.20)	(-0.57)	-1.06	-0.22
Observations	8,060	2,805	8,121	2,828
R-squared	0.167	0.18	0.114	0.115

The dependent variables are schooling and uniform expenditures made by the household on each child, reported only for those children currently in school. Schooling and uniform expenditures are in log form. No data is available for the 30th month (i.e. 3rd wave).
Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for a set of control variables including child's gender and age, household size, recipient's age, education and marital status, districts, household demographic composition, proximity to primary school and food market, and a vector of cluster-level prices.

The program has also a strong and significant impact on whether children own shoes (see Table 19). As shoes can be bought for any child, not just those in school, we report results on 2 samples: children currently enrolled and all school-age children. The coefficients are very similar. Indeed, shoes ownership for children 5-14 in treated households increased by 33/34 percentage points after 2 years; after three years the impact is still statistically significant even though the coefficient is smaller (23/24 percentage points). Coefficients between the two samples are very similar indicating that all kids are getting shoes. This is interesting as it shows that shoes are not the only reason kids are not being sent to school, indeed even if some kids get shoes they still do not go to school.

Table 19: Impact of CGP on shoes ownership. Pooled cross-section

	Age group 5-14		Age group 11-14	
	(1)	(2)	(1)	(2)
VARIABLES	All school age children	School age children enrolled	All school age children	School age children enrolled
Treated	0.00404	-0.00311	-0.00597	-0.0197
	(0.15)	(-0.10)	(-0.16)	(-0.53)
DD Wave 2	**0.330**	**0.336**	**0.307**	**0.308**
	(6.24)	(6.04)	(4.85)	(4.87)
DD Wave 4	**0.244**	**0.229**	**0.201**	**0.202**
	(6.67)	(5.39)	(4.29)	(4.19)
Age	*-0.0137*	**-0.0444**	-0.415	-0.300
	(-1.72)	(-2.54)	(-0.93)	(-0.64)
Age-squared	**0.00110**	**0.00241**	0.0168	0.0124
	(2.51)	(2.82)	(0.98)	(0.68)
Female	0.000395	-0.00870	-0.0135	-0.0196
	(0.05)	(-0.76)	(-0.78)	(-1.06)
Observations	13,170	8,124	3,155	2,818
R-squared	0.254	0.260	0.256	0.262

The dependent variable is shoes ownership (dummy o/1): for each child age 5 to 18, the respondent reports whether the child has a pair of shoes. This question is asked whether or not the child is currently enrolled in school.

Estimations use difference-in-difference modeling. Robust t-statistics clustered at the CWAC level are in parentheses. Bold indicates that they are significant at p < .05. All estimations control for a set of control variables including child's gender and age, household size, recipient's age, education and marital status, districts, household demographic composition, proximity to primary school and food market, and a vector of cluster-level prices.

So, how does the unconditional cash transfer impact on schooling? In the previous section we see that for the older age group time spent on paid work decreased (paid work has been decreasing); the cash transfer might have therefore enabled households to give up these children's contribution to household labour. In this section, results suggest that, thanks to the CGP program, beneficiary households have been able to afford to spend more on education expenditures including fees, uniform, transport, stationary and books, PTA levy and any other; in particular, among these expenditures, uniforms - a sub-aggregate of education expenditures - have recorded a significant increase. The bi-monthly transfers have also enabled households to meet the costs of basic necessities such as shoes for their children.

7 Discussion and Conclusions

This paper reports the impact on child schooling and work of the Government of Zambia's Child Grant Program (CGP), an unconditional cash transfer program targeted to households with children under age 5 years in three districts of the country. Although the CGP focus is on very young children, we look to see if nevertheless the program has impacts on older children who are not the explicit target group. Indeed, since money is not tied to behavior, impacts may be found in any sphere, depending on what the major constraints are facing households, and how the household itself believes the cash can best address its needs. Although there have been several published studies on the impact of CCTs on schooling, the literature on unconditional cash transfers is scant.

We use data from a large-scale social experiment involving 2,500 households, half of whom were randomized out to a delayed-entry control group, that was implemented to assess the impact of the program.

Ex-ante analysis suggests that given the pattern of income effects and structural features of the Zambian schooling system, we would see impacts at very young ages encouraging the on-time enrollment into school of younger kids who are entering the system for the first time; at the age of drop out, and no impacts on child labor.

Actual estimated impacts conform to this pattern. Indeed, the CT is proven to be effective in raising school enrolment but not in reducing child labour. Program impacts on enrollment at age 4-7 range from 5 to 6 percentage points; large impacts from 6 to 9 percentage points are also reported for children age 11-14 years old who are transitioning to lower secondary school (depending on the exposure to the programme). These impacts compare quite favorably with the 7 point impact of Progresa on enrollment reported by Brauw and Hoddinott (2008), or the 5-7 percentage points impact reported by Attanasio et al (2010) in the Colombian CCT. There seem to be no impact on child labour for the younger age groups although there is a significant reduction in participation in paid work around 4 points for the 11-14 year olds.

Finally, we provide some preliminary evidence on the potential pathways through which the unconditional cash transfer impacts on enrollment. Results suggest that, thanks to the CGP program, beneficiary households have been able to afford to spend more on education expenditures and in particular on uniform expenditures; the bi-monthly transfers have also enabled households to meet the costs of basic necessities such as shoes for their children. Indeed, the provision of an unconditional cash transfer has the potential to alleviate some of the barriers that inhibit educational access.

Appendix

Table A1. Table of means of all control variables used for children 4-17 at baseline

Variable	Obs	Mean	Std. Dev.	Min	Max
Child age	5447	9.114375	3.781824	4	17
Child age-squared	5447	97.3714	76.09707	16	289
Female	5407	0.5052709	0.5000185	0	1
Recipient's age	5447	35.01981	6.349349	30.94932	78
Recipient never married	5447	0.0688452	0.253214	0	1
Recipient divorced	5447	0.1011566	0.3015637	0	1
Recipient widow	5447	0.07472	0.2629632	0	1
Recipient attended school	5432	0.7190722	0.4494937	0	1
Log of hh size	5447	2.054994	0.2569026	1.098612	2.833213
0-5 hh members	5447	2.057279	0.7899164	0	7
6-12 hh members	5447	1.983661	1.120826	0	6
13-18 hh members	5447	0.9379475	0.9951246	0	5
19-35 hh members	5447	1.204149	0.8753559	0	7
36-55 hh members	5447	0.7778594	0.7858473	0	3
56-69 hh members	5447	0.0769231	0.287699	0	2
70+ hh members	5447	0.0268037	0.169295	0	2
Shangombo district	5447	0.294474	0.4558478	0	1
Kaputa district	5447	0.3067744	0.4611973	0	1
Men wage	5447	16.42646	25.37965	1.5	150
Women wage	5447	14.75131	22.38606	1.5	150
Child wage	5447	16699.39	27670.03	800	100000
Log distance to food market	5447	2.217489	1.29994	0	4.510859
Log proximity to primary school	5447	3.365084	0.4973814	1.203973	4.510859
Secondary school fees	5447	172.8011	175.0451	4.5	600
Log pc consumption	5447	3.347532	0.6549812	1.140459	5.788517
Prices					
Maize grain	5447	27.96999	10.87076	2.295551	45.91102

Rice	5447	4.156808	1.882636	0.9182205	8.03443
Beans	5447	4.187916	1.89816	1.147776	10.32998
Fish	5447	2.868288	2.734423	0.2295551	11.47776
Chicken	5447	16.6596	7.03537	1.147776	28.69439
Oil	5447	12.69142	1.536683	9.182205	15.49497
Sugar	5447	9.072105	1.97538	1.721663	11.47776
Salt	5447	4.64846	3.908277	0.8608317	20.08607
Tsoap	5447	5.843878	1.140707	4.017215	9.182205
Lsoap	5447	5.964661	1.491478	3.443327	9.182205
Panadol	5447	3.452145	2.735401	0.2295551	8.608316

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