

# Evaluating the Impact of Conditional Cash Transfer Programs: Evidence from Morocco

Marouane IKIRA<sup>1,\*</sup>, Abdeljaouad EZZRARI<sup>2</sup>

<sup>1</sup>Département des sciences économiques et gestion, Université Hassan II, Casablanca, Morocco  
<sup>2</sup>Observatoire des conditions de vie de la population, Haut-Commissariat au Plan, Rabat, Morocco  
\*Corresponding author: [ikira.merouane@gmail.com](mailto:ikira.merouane@gmail.com)

Received April 20, 2021; Revised May 25, 2021; Accepted May 31, 2021

**Abstract** In many developing countries, conditional cash transfer (CCT) programs have a significant social impact. They seek to combat poverty through redistributive transfers, and to combat transmission of poverty through generations by investing in human capital in the form of children. Several studies show that these programs have succeeded in increasing the demand for education and reducing child labor. This paper aims to assess the impact of Morocco's conditional cash transfer program (Tayssir) on school attendance and labor of rural children aged 6 to 15 years. Using data from the Household Panel Survey conducted by the National Observatory for Human Development (ONDH), we estimate first an Average-treatment-Effect (ATE) by using Propensity Score Matching. This initial analysis shows that Tayssir has significantly increased enrollment rates and reduced child labor. In order to refine the analysis and due to non-compliance with the criteria of eligibility, we also estimate a Local Average Treatment Effect (LATE) by using the eligibility rule as an instrumental variable. This second analysis shows that Tayssir has had no significant effect on children whose participation was assigned under the eligibility rule (the compliers). This suggests that the program requires additional measures.

**Keywords:** conditional cash transfers, instrumental variable estimation, local average treatment effect, tayssir, propensity score matching

**Cite This Article:** Marouane IKIRA, and Abdeljaouad EZZRARI, "Evaluating the Impact of Conditional Cash Transfer Programs: Evidence from Morocco." *American Journal of Educational Research*, vol. 9, no. 5 (2021): 320-329. doi: 10.12691/education-9-5-10.

## 1. Introduction

As one of the most important factors in human development (Schultz [1]; Becker [2]), education must be developed to help the poor escape poverty. School dropout rates reflect the level of poverty, and experience shows, especially in developing countries, that children from materially deprived households are the least educated. This indicates the crucial role that public education can play in combating poverty. Starting in the 1990s, many developing countries, especially in Latin America and South Asia, have invested heavily in education. Since 1994, Bangladesh's Food For Education (FFE) program has provided 'in-kind' transfers to low-income households with children attending school. By the same logic, since 1997 the Mexican program Progresá has conditioned cash transfers on school attendance in low-income rural localities. These programs have several objectives. First, they aim to combat current poverty through redistributive transfers. Second, they seek to reduce future poverty. Conditional cash transfer programs are based on two assumptions. The first is that limited resources prevent parents from sending their children to school. The second is that educational level is a significant determinant of future poverty.

In the case of Morocco, the approach has been one of lump sum transfers. Studies by the High Commission for Planning (HCP) show it to have failed. According to the 2001 National Survey of Household Consumption and Expenditure, the wealthiest quintile of households receives over 40% of food subsidies and over 50% of subsidies for secondary and higher education. Thus, the lump sum transfer approach has helped to increase economic inequality, making it essential to seek an alternative policy in support of disadvantaged citizens.

Tayssir is one of a new set of policies aimed directly at improving the target population's standard of living. It helps needy households finance their children's school costs. The program combats school dropouts in rural Morocco by neutralizing factors that affect the demand for education negatively, particularly in disadvantaged areas. This paper aims at analysing the impact of cash transfer on access to education and on child labor. We start from the hypothesis that cash transfers to poor households, conditional on their children attending school, can stimulate demand for education and reduction of child labor (Ravallion and Wodon [3]; De Janvry and al [4]; Skoufias and al [5]; Kilburn and al [6]; Attanasio and al [7]; Del Carpio and al [8]).

Unlike previous studies (Benhassine & al [9] and Gazeaud & Ricard [10]), our study also aims to analyze

the effect of Tayssir on the probability of child labor as an indirect effect of cash transfers. Theoretically, they are expected to reduce the child labor through two mechanisms (Edmonds and Schady [11]). First, beneficiary children have to attend school regularly. This reduces the time for child work and increases, however, the time they spend in school. Second, increasing family income through a cash transfer can decrease the occurrence of working children, considering the fact the extra revenue may release children from their economic tasks (Hidayatina and Garces-Ozanne [12]).

In order to assess the effect of Morocco's conditional cash transfers program on school attendance and child labor we estimate first an Average-treatment-Effect (ATE) by using Propensity Score Matching. The findings are in line with Benhassine & al [9] and Gazeaud & Ricard [10]. In order to refine the analysis and due to non-compliance with the criteria of eligibility, we also estimate a Local Average Treatment Effect (LATE) by using the eligibility rule as an instrumental variable (Hidayatina and Garces-Ozanne [12]). This second analysis, however, shows that Tayssir has had no significant effect on children whose participation was assigned under the eligibility rule (the neediest).

The remainder of the paper is structured as follows: Section 2 reviews the literature. The third section outlines the data used in the Moroccan context. Section 4 presents our initial analysis; Section 5 gives a refined analysis using instrumental variables. The final section concludes.

## 2. Literature Review

### 2.1. School Dropout Risk Factors

Here we discuss the theoretical justification of policies to combat school dropouts. Implementing such policies requires an analysis of the determinants of dropouts. Understanding the determinants allows decision-makers to identify the populations concerned, and thus target measures in their direction. The literature shows that school dropout stems not only from characteristics of individual children (De Vreyer [13]; Buchmann [14]; Jimerson and al [15]; Glewwe [16]), but also from a set of family, socio-economic and community factors (Vinas-Forcade and al [17]; Itzhaki and al [18]; Glewwe and Kassouf [19]).

No et al [20] conclude that poorly educated or illiterate parents normally do not regard schooling essential for a child's cultural and social development. Well-educated parents consider it essential, meaning that their children feel more comfortable at school and are supported in their studies. The authors also find enrollment to be hampered by the cost of school fees, transport and school supplies.

In addition to direct costs, some households also bear indirect (opportunity) costs. This can happen when children go to school instead of participating in household economic activity. In other words, school enrollment also depends on the household's ability to forego such participation. This condition is difficult to apply to poor families, where children support family income (Jacoby

and Skoufias [21]; Naseer and al [22]). Conditional cash transfer programs require removal of this constraint on demand for education.

As regards site of residence, Diagne [23] concludes that school dropout is higher in rural than urban areas. This is due to several factors: school infrastructure is more developed in cities than rural areas, rural children live further from their schools, and rural parents are less inclined to view their children as human capital.

Other writers find school dropout resulting from a combination of frustrations, produced by lower academic achievement and problems of relations with peers, teachers and parents. Clearly efforts to combat dropout should be made while the child attends school, because it is easier to keep him in school than to get him to go back (Rumberger [24]; Gao and al [25]).

### 2.2. Impacts of Conditional Cash Transfers

In this section, we review studies analyzing the impact of conditional cash transfers in environments similar to Morocco's. Using longitudinal data from the 1998-2005 school census (8 years), Glewwe et Kassouf [19] analyze the impact of Brazil's cash transfer program 'Bolsa Escola' (renamed Bolsa Familia) on the demand for education. Comparing enrollment rates in public schools benefiting from the program with non-benefiting schools, in its first two years Bolsa Escola increased the enrollment rate in the first four grades of primary school by 2.8%.

Attanasio et al [26] seek to measure the effect of Colombia's cash transfer program (Familias en Acción) on school attendance and child labor. Using the propensity score matching estimator, the study shows that conditional cash transfers increased the schooling rate of children aged 14 to 17 by 5 to 7 percentage points.

Still in Latin America, where there are several conditional cash transfer programs, Skoufias and al [5] used experimental data and double difference estimators to assess the impact of Mexico's cash transfer program "Progresá" on school attendance. Their estimates show significant increases in school attendance of both boys and girls, accompanied by significant reduction in their participation in labor.

Several studies had limited their researches to the impact of cash transfer programs on child labor. They conclude that cash transfers appear to be effective strategies for reducing child work in developing countries.

Hidayatina and Garces-Ozanne [12] show that the Indonesian intervention (Program Keluarga Harapan) reduces the probability of child work in household tasks and economic activities. In Nicaragua, Gee [27] find that the cash transfers program (Red de Protección Social) reduced both the probability of occurrence (engaging in work) and the duration (weekly hours) of child labor. The impact of cash transfers programs on child labor depends not only on the definition of the working outcomes of children, but also on the frequency of receiving subsidies. In Philippines, De Hoop and al [28] conclude that the cash transfers generate an increase in children's working for pay, because the program only provided a partial subsidy. This implies that children have to work in order to cover their school fees.

### 3. Moroccan Context

#### 3.1. Data

The data used here come from the Household Panel Survey conducted by the National Observatory for Human Development<sup>1</sup> (ONDH). It is a sample of 8,000 households followed during three waves in 2012, 2013 and 2015. In this study we use the wave of 2015.<sup>2</sup> The sample of 8,000 households was chosen to represent all categories of Moroccan households. Geographically, the survey covered all the country's regions. In addition to geographical representativeness, it also covers the main dimensions of human development, namely education, health, employment and household consumption expenditure. ONDH main objective is to evaluate impact of human development policies and propose further interventions to enhance human development in Morocco.

#### 3.2. Moroccan Education System

As in most countries, Morocco's education system comprises the three main levels of primary, secondary and higher. Schooling in Morocco is compulsory from the age of six (Gouzi and El Aoufi [29]). The system consists of six years of primary school, three years of intermediate, three years of upper secondary, and tertiary education. The primary education cycle serves children aged 6 to 11 years, comprising six years of study towards the certificate of primary studies. Intermediate school serves children aged 12 to 14 years having earned the primary certificate.

Upper secondary school, comprising three years, is open to students having completed intermediate school. The first year offers a core curriculum, while the following two years form the baccalaureate cycle. Primary education and the secondary school cycle are compulsory for children aged 6 to 15 years.

#### 3.3. Morocco's Conditional Cash Transfer Program

Managed by the Moroccan Association for School Support (AMAS) in partnership with the Ministry of Education, Tayssir, implemented since 2008, is a conditional cash transfer program for poor households. It is designed to help neutralize the economic constraints affecting education demand in rural areas. Tayssir is conditional on effective schooling of target children (fewer than four absences per month). It targets schools located in municipalities where the poverty rate is above 30% according to the High Planning Commission (HCP)'s 2004 poverty map. To benefit from the program, a child must be aged 6 to 15 years and enrolled in a designated school. Tayssir's pilot phase was implemented during 2008-10 in five regions. It was then extended to all schools in eligible municipalities. The monthly transfer amounts to 60DH (≈\$5.85) per child for the first two years

of primary, 80DH (≈\$7.79) for the following two years, 100DH (≈\$9.74) for the last two years of primary, and finally 140DH (≈\$13.64) for high school students. Tayssir transfers are much lower than other similar programs (Table 1).

Table 1. Amounts offered by different cash transfer programs

Country	Program	Monthly transfer as % of household consumption
Morocco	Tayssir	5
Mexico	Progresa	20
Indonesia	Program Keluarga Harapan	17.5
Nicaragua	Red de Protección Social	20

Source : Banerjee et al [30].

### 4. Initial Analysis

This section presents the initial methodology used to assess Tayssir's impact. The sample comprised 3,029 children, aged 6 to 15, evenly distributed among boys and girls, from 1,680<sup>3</sup> rural households. Table 2 presents data on those households, showing a Tayssir participation rate of 24.45%.

#### 4.1. Propensity Score Matching

The main object of evaluating a program's impact is to derive its results and show to what extent it has led to changes--i.e. an impact evaluation is structured around the following question: what is a program's causal impact (direct and exclusive) on a given outcome? The challenge lies in identifying what benefits the program's beneficiaries would have enjoyed had they not participated in the program (the counterfactual scenario). For this reason, creating a comparison group tells us what would have happened had a participant not taken part. We use the propensity score matching method (PMS) suggested by Rosenbaum and Rubin [31] to create a comparison group. This method consists of matching actual participants (treatment group) to a group of non-participants (control group) with similar observable characteristics. We estimate the probability of participation in the program by members of the two groups. This probability is termed the propensity score. Estimating this score requires a probit regression model. The exogenous variables used are the child's age and sex, annual household consumption expenditure per capita, the distance between home and the nearest primary school, and a composite indicator of the standard of living<sup>4</sup> (see Appendix A).

Once the probability of participation is estimated for all members of the sample, we use the Nearest Neighbor Matching algorithm suggested by Rubin [32] to match beneficiaries to the closest non-beneficiaries.

<sup>1</sup> It is an organization whose mission is to assess the effect of human development policies implemented in Morocco.

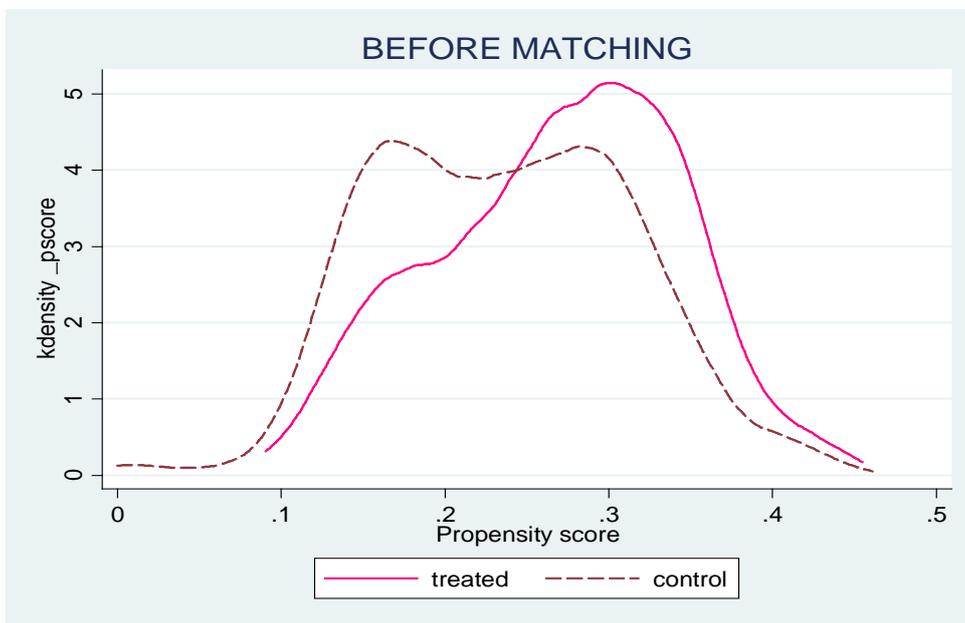
<sup>2</sup> We do not have access to the other waves of the survey.

<sup>3</sup> This is the number of rural households with children aged 6 to 15 years.

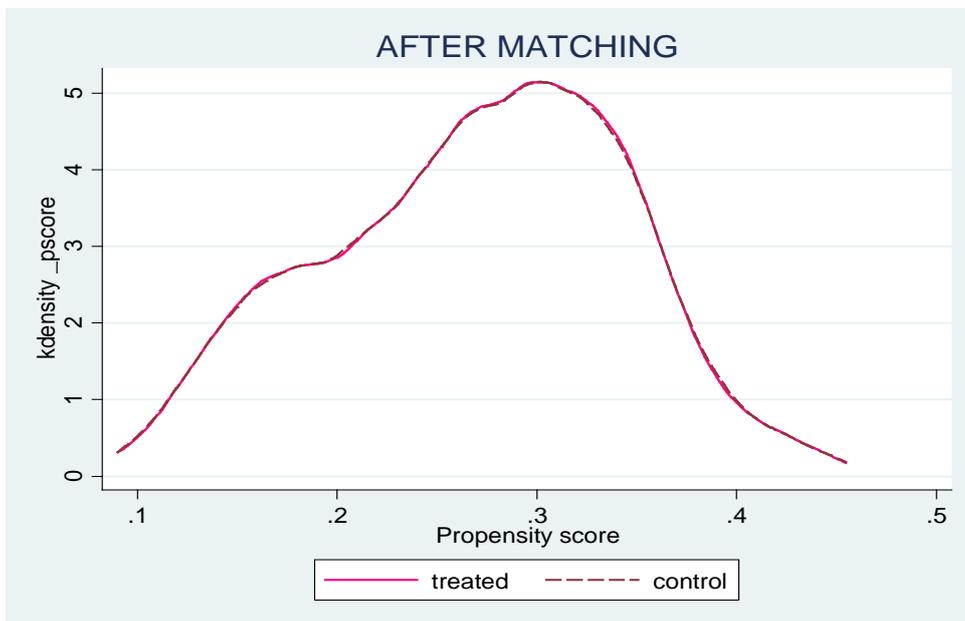
<sup>4</sup> It is calculated using the multiple correspondence analysis (MCA) technique. The variables used for this are presented in Appendix B.

**Table 2. The Sample**

Variables	Treatment group	Control group
	Mean / percentage	Mean / percentage
<b>Child characteristics</b>		
Age	10.82	10.59
Gender (% male)	49.53	51.18
Dropout rate	5.67	10.74
<b>Household characteristics</b>		
Eligibility	83.97	31.00
Household Consumption Expenditure DH per capita (annual).	9,812.20	11,004.27
Gender of head of household (% male)	92.11	91.45
Head of household as an employee	80.70	80.66
Poverty rate	10.43	4.66
Children as % of household members	30.95	29.40
Head of household is illiterate	38.06	39.83
N	741	2,288



**Figure 1.** Distribution of the two groups before matching



**Figure 2.** Distribution of the two groups after matching

Next, we use graphical analysis to verify the comparability of the two groups, based on comparing their propensity scores before and after matching (Figure 1 and Figure 2 above). We apply the standardized difference test (Rosenbaum and Rubin [33]) to test the validity of balancing the two groups' characteristics. This test measures the degree of bias reduction by comparing, for each variable used in the propensity score, the means of participants and nonparticipants before and after matching (see Appendix C).

## 4.2. Results and Discussion

The propensity score matching method shows Tayssir significantly increasing school enrollment and reducing child labor (Table 3). All differences yield significant Student T values.

Table 3. Tayssir's impact on school attendance and child labor

Variables	Sample	Treatment group	Control group	Difference	T-stat
Enrollment rate	<i>Unmatched</i>	94,3%	89,24 %	5,06	4.08
	<i>ATT</i>	94,4 %	86,85 %	7,55	4.10
Child labor rate	<i>Unmatched</i>	4,47 %	11,75 %	-7,28	-5.77
	<i>ATT</i>	4,40 %	11,78 %	-7,38	-4.31

Enrollment rate is calculated by dividing the number of children enrolled by the size of the sample (3,029 children). Child labor rate was calculated using the same formula.

We note also that participation in Tayssir increases enrolment of rural children by 7.55 percentage points. This result is in line with international experience showing that cash transfers are important in helping poor households keep their children in school (Bauchet and al [34]; Giang and Nguyen [35]). We also find that Tayssir reduces the child labor rate by 7.38 percentage points. This is in line with our expectation, insofar as transfers to poor households reduce the opportunity cost of education (Hidayatina and Garces-Ozanne [12]; Del Carpio et al [8]).

However, to make the assessment relevant, we need to check the relevance of the eligibility rule. In other words, if households are chosen solely based on the eligibility variable (the municipal poverty rate), this means that every household  $i$  from an eligible municipality  $j$  is a beneficiary of the program ( $T_i=1$  if  $P_j > 30\%$ ). In this case, participation in the program is determined, and depends only on eligibility. However, as shown in Table 4 below, participation in Tayssir is not determined, and presents ambiguity. About 71.42% of households (1200/1680) participate because they are eligible. However, about 25.23% (424/1680) are eligible but do not participate, and 3.3% (56/1680) are not eligible but do participate.

Statistically, it implies that:  $P(T=1|Z=1) \neq 1$  and  $P(T=1|Z=0) \neq 0$  (see Givord [36]). To solve this, we follow Chong & Yáñez-Pagans [37] and Choi & Lee [38]. We estimate a Local Average Treatment Effect (LATE) by using the eligibility rule as an instrumental variable. As non-compliance in this case is two-sided (Table 4 below), the LATE allow us to estimate the effect on actual beneficiaries (see more details in the next section).

Table 4. Relation between household eligibility and participation in Tayssir

	Not eligible (Z=0)	Eligible (Z=1)	Total
Non-beneficiary	895	424	1319
Beneficiary	56	305	361
Total	951	729	1680

On the other hand, this analysis demonstrates the endogenous nature of participation in Tayssir. Accordingly, the instrumental variable<sup>5</sup> (IV) method is the most appropriate approach to analyzing Tayssir's causal effect. To begin with, it captures the exogenous variation of participation. This variation can then be used to identify the causal effect (Givord [36]).

## 5. Instrumental Variable Analysis

### 5.1. Local Treatment Effect

With the instrumental variable method, an instrument "Z" and a vector of exogenous variables "X" explain participation in Tayssir. Representing the eligibility rule, instrument "Z" takes 1 if the child is eligible, zero otherwise. We consider the following specification:

$$T_i = \delta X_i + \lambda Z_i + w_i \quad (1)$$

where "T" designates the treatment variable, taking 1 if the child is a beneficiary of Tayssir and zero otherwise. "X" is a vector of child and household characteristics, and "w" is an unobserved error term. As the instrument represents the eligibility rule, it is most likely to be correlated with participation. We assume that the unobserved errors are not correlated with the instrument. We set:  $cov(u, Z) = 0$ . If this is correct, Tayssir's causal effect is obtained by estimating the second specification:

$$Y_i = X_i\beta + \alpha \hat{T}_i + u_i \quad (2)$$

where  $\hat{T}_i$  is obtained by estimating equation (1). The second equation gives us Tayssir's causal effect for children whose participation is assigned by the eligibility rule (compliers). This is called the Local Average Treatment Effect (LATE). For cases with a binary treatment and instrument, Table 5 defines four subpopulations. LATE gives the average treatment effect on compliers only (Angrist et al [39]).

<sup>5</sup> Method IV controls the selection bias created by unobserved characteristics.

**Table 5. Relationship between instrument and treatment**

	Not eligible (Z=0)	Eligible (Z=1)
Non-beneficiary	Defiers	Never Takers
Beneficiary	Always Takers	Compliers

### 5.2. Instrument Validity

Estimation of equation (2) shows that the eligibility rule has a positive and significant impact on participation (Table 6 below). The partial R<sup>2</sup> and the Fisher statistic (Hahn and Hausman [40]) are statistically significant (see Appendix D). These results confirm that the eligibility rule is a relevant instrument for participation in Tayssir. Although the instrument and the treatment variable are correlated (cov (T, Z) ≠ 0), we must ensure that the instrument (the eligibility rule) is not correlated with the equation 2 error term (the exclusion restriction). Since eligibility for Tayssir is not effectively subject to the level of household resources (targeting by municipalities), we assume that the eligibility rule cannot directly affect the outcome.

### 5.3. Results and Discussion

We note that: 1) school attendance variable is equal to 1 if child enrolled, 0 otherwise; 2) Child labor variable is also unity if child work, 0 otherwise. Unfortunately, the survey do not provide information about the type of child work (household chores, paid work...).

Our estimates show that Tayssir neither affects school attendance nor reduces child labor significantly (Table 6 below). Accordingly, we suggest policymakers should question its effectiveness.

In other words, a program such as Tayssir enhances demand for education given favorable conditions of

schooling. When the school is far from home, children have to walk long distances. This generates transport costs and requires physical effort, particularly given a harsh climate. To take these conditions into account, we perform another analysis on two subsamples, comprising children who walk less or more than three kilometers. In the second subsample, the effect of the cross variable (Eligibility × Participation) on school attendance is not significant (see Appendices E and F). This means that Tayssir’s small transfers, once they cover clothing and school supplies, do not suffice to finance transport costs. In such a situation, the cash-transfer program is insufficient to improve school attendance, especially in disadvantaged areas.

Some eligible rural municipalities are mountainous areas with poor roads. Their children must cross rivers to reach school; occasional flooding hampers school attendance. In those areas cash transfer does not suffice to encourage parents to enroll their children. Tayssir’s insignificant impact may also be explained by the remoteness and inaccessibility of other basic social services. In our sample, eligible households are supposed to walk more than five kilometers to reach the nearest health center. When a nearer health center helps the beneficiary household save on a sick child’s transport costs, Tayssir transfers can be restricted to educational needs.

Moreover, 51.44% of eligible households lack running water, and depend on children to fetch their water. This cuts into time for school and homework, raising the risk of dropout. Poor communities use their children to support family income, thus minimizing Tayssir’s reduction of child labor. Tayssir’s modest impact may also be due to irrelevant targeting. Transfers are supposed to be targeted to the neediest, but municipalities commit errors of inclusion and exclusion.

**Table 6. Estimation by instrumental variable of Tayssir’s impact**

	School attendance		Child labor	
	First stage	Second stage	First stage	Second stage
Treatment		0.0280 (0.74)		-0.0179 (-1.04)
Age of child	0.0042 (1.36)	-0.0355 (-5.10)***	0.0042 (1.36)	0.0752 (7.03)***
Gender of child (Reference: boy)	0.0049 (0.27)	-0.0495 (-3.68)***	0.0049 (0.27)	-0.0195 (-3.20)***
Proportion of children living in household	0.1302 (1.90)**	-0.0347 (-0.68)	0.1302 (1.90)**	0.0620 (2.66)***
Head of household is illiterate	-0.0153 (-1.18)	0.0062 (0.32)	-0.0153 (-1.18)	0.0144 (1.64)
Head of household is an employee	-0.0088 (-2.98)***	0.0405 (4.17)***	-0.0088 (-2.98)***	0.0107 (2.44)***
Gender of household head (Reference: male)	-0.0184 (-0.49)	0.0249 (0.89)	-0.0184 (-0.49)	-0.0163 (-1.29)
Instrument (Z)	0.3575 (9.55)***		0.3575 (9.55)***	
Cons	0.0020 (1.03)	0.3068 (2.89)***	0.0020 (1.03)	-0.0141 (-0.59)
R <sup>2</sup>	0.1916	0.1402	0.1916	0.0452

(\*\*\*) significant at 1%; (\*\*) significant at 5%; (\*) significant at 10%

## 6. Conclusion

Conditional cash transfer programs play an important social role. They seek to combat poverty and promote accumulation of human capital in the form of the beneficiary children. Several studies have shown the positive effect of these programs on demand for education. This paper's contribution is to evaluate the impact of Morocco's cash transfer program on school attendance and child labor. Initial results show that Tayssir has increased school attendance and reduced child labor. However, estimation by instrumental variables shows that the program has no significant effect on households whose participation coincides with the eligibility rule (compliers). Several factors may explain this, notably lack of basic infrastructure and irrelevance of the targeting method. From a methodological viewpoint, it is not certain that the insignificant impact can be generalized to the entire population. In other words, the instrumental variable estimator measures Tayssir's impact only on compliers. Moreover, school dropout is not only due to lack of resources. In some cases the decision to quit school results from mounting frustration caused by academic failure as well as difficult relationships with peers, teachers and parents. Prevention strategies must be deployed while the child is in school, since it is much easier to keep him there than to make him go back. We evoke the case of the Indian program *Multilingual Education Intervention*, conducted in disadvantaged localities. Its aim is to increase the success rate of girls who master only their mother tongue. Once at school these girls are marginalized due to failure to master the language of instruction. Here the authorities have introduced a measure aimed directly at the cause of school dropout.

## References

- [1] T.W. Schultz, Investment in human capital, *Am. Econ. Rev.* 51 (1961) 1-17.
- [2] G.S. Becker, Human capital: A theoretical and empirical analysis, with special reference to education, University of Chicago press, 2009.
- [3] M. Ravallion, Q. Wodon, Does Child Labor Displace Schooling? Evidence on Behavioral Responses to an Enrollment Subsidy. Policy Research Working Papers No. 2116., (1999).
- [4] A. de Janvry, F. Finan, E. Sadoulet, How Effective are Educational Subsidies Programs for the Rural Poor? *Progresa in Mexico*, ARE Univ. Calif. Berkeley. (2001).
- [5] E. Skoufias, S.W. Parker, J.R. Behrman, C. Pessino, Conditional cash transfers and their impact on child work and schooling: Evidence from the *progresa* program in Mexico [with comments], *Economia*. 2 (2001) 45-96.
- [6] K. Kilburn, S. Handa, G. Angeles, P. Mvula, M. Tsoka, Short-term impacts of an unconditional cash transfer program on child schooling: Experimental evidence from Malawi, *Econ. Educ. Rev.* 59 (2017) 63-80.
- [7] O. Attanasio, E. Fitzsimons, A. Gomez, The impact of a conditional education subsidy on school enrolment in Colombia, (2005).
- [8] X. V Del Carpio, N. V Loayza, T. Wada, The impact of conditional cash transfers on the amount and type of child labor, *World Dev.* 80 (2016) 33-47.
- [9] N. Benhassine, F. Devoto, E. Duflo, P. Dupas, V. Pouliquen, Turning a shove into a nudge? A "labeled cash transfer" for education, *Am. Econ. J. Econ. Policy*. 7 (2015) 86-125.
- [10] J. Gazeaud, C. Ricard, Cash Transfers and School Performances: New Evidence from Morocco, 2020.
- [11] E. V Edmonds, N. Schady, Poverty alleviation and child labor, *Am. Econ. J. Econ. Policy*. 4 (2012) 100-124.
- [12] A. Hidayatina, A. Garces-Ozanne, Can cash transfers mitigate child labour? Evidence from Indonesia's cash transfer programme for poor students in Java, *World Dev. Perspect.* 15 (2019) 1.
- [13] P. De Vreyer, Une analyse économétrique de la demande d'éducation en Côte-d'Ivoire, *Rev. Econ. Dev.* 1 (1993) 49-79.
- [14] C. Buchmann, Family structure, parental perceptions, and child labor in Kenya: What factors determine who is enrolled in school?, *Soc. Forces*. 78 (2000) 1349-1378.
- [15] S. Jimerson, B. Egeland, L.A. Sroufe, B. Carlson, A prospective longitudinal study of high school dropouts examining multiple predictors across development, *J. Sch. Psychol.* 38 (2000) 525-549.
- [16] P. Glewwe, Schools and skills in developing countries: education policies and socioeconomic outcomes, *J. Econ. Lit.* 40 (2002) 436-482.
- [17] J. Vinas-Forcade, C. Mels, M. Valcke, I. Derluyn, Beyond academics: Dropout prevention summer school programs in the transition to secondary education, *Int. J. Educ. Dev.* 70 (2019) 102087.
- [18] Y. Itzhaki, H. Itzhaky, Y.B. Yablon, The contribution of parental and societal conditional regard to adjustment of high school dropouts, *J. Adolesc.* 62 (2018) 151-161.
- [19] P. Glewwe, A.L. Kassouf, The impact of the Bolsa Escola/Familia conditional cash transfer program on enrollment, dropout rates and grade promotion in Brazil, *J. Dev. Econ.* 97 (2012) 505-517.
- [20] F. No, K. Taniguchi, Y. Hirakawa, School dropout at the basic education level in rural Cambodia: Identifying its causes through longitudinal survival analysis, *Int. J. Educ. Dev.* 49 (2016) 215-224.
- [21] H.G. Jacoby, E. Skoufias, Risk, financial markets, and human capital in a developing country, *Rev. Econ. Stud.* 64 (1997) 311-335.
- [22] M.N.U. Din, H. Dad, J. Iqbal, S.S.A. Shah, M.I. Niazi, Causes of male dropout rate in Pakistan, *J. Coll. Teach. Learn.* 8 (2011) 37-42.
- [23] A. Diagne, Pourquoi les enfants africains quittent-ils l'école? Un modèle hiérarchique multinomial des abandons dans l'éducation primaire au Sénégal, *Actual. Econ.* 86 (2010) 319-354.
- [24] R.W. Rumberger, Dropping out, Harvard University Press, 2011.
- [25] S. Gao, M. Yang, X. Wang, W. Min, S. Rozelle, Peer relations and dropout behavior: Evidence from junior high school students in northwest rural China, *Int. J. Educ. Dev.* 65 (2019) 134-143.
- [26] O. Attanasio, E. Fitzsimons, A. Gomez, M.I. Gutierrez, C. Meghir, A. Mesnard, Children's schooling and work in the presence of a conditional cash transfer program in rural Colombia, *Econ. Dev. Cult. Change*. 58 (2010) 181-210.
- [27] K.A. Gee, Reducing child labour through conditional cash transfers: Evidence from Nicaragua's red de protección social, *Dev. Policy Rev.* 28 (2010) 711-732.
- [28] J. De Hoop, J. Friedman, E. Kandpal, F. Rosati, Child schooling and child work in the presence of a partial education subsidy, *The World Bank*, 2017.
- [29] A.B. Gouzi, N. El Aoufi, La non-scolarisation au Maroc Une analyse en termes de coût d'opportunité. *Crit. Économique*. (2007).
- [30] A. V Banerjee, R. Hanna, G.E. Kreindler, B.A. Olken, Debunking the stereotype of the lazy welfare recipient: Evidence from cash transfer programs, *World Bank Res. Obs.* 32 (2017) 155-184.
- [31] P.R. Rosenbaum, D.B. Rubin, The central role of the propensity score in observational studies for causal effects, *Biometrika*. 70 (1983) 41-55.
- [32] D.B. Rubin, The use of matched sampling and regression adjustment to remove bias in observational studies, *Biometrics*. (1973) 185-203.
- [33] P.R. Rosenbaum, D.B. Rubin, Constructing a control group using multivariate matched sampling methods that incorporate the propensity score, *Am. Stat.* 39 (1985) 33-38.
- [34] J. Bauchet, E.A. Undurraga, V. Reyes-García, J.R. Behrman, R.A. Godoy, Conditional cash transfers for primary education: Which children are left out?, *World Dev.* 105 (2018) 1-12.
- [35] L.T. Giang, C.V. Nguyen, How would cash transfers improve child welfare in Viet Nam?, *Child. Youth Serv. Rev.* 82 (2017) 87-98.
- [36] P. Givord, Méthodes économétriques pour l'évaluation de politiques publiques, *Econ. Previs.* (2014) 1-28.

- [37] A. Chong, M. Yáñez-Pagans, Not so fast! Cash transfers can increase child labor: Evidence for Bolivia, *Econ. Lett.* 179 (2019) 57-61.
- [38] J. Choi, M. Lee, Relaxing conditions for local average treatment effect in fuzzy regression discontinuity, *Econ. Lett.* 173 (2018) 47-50.
- [39] J.D. Angrist, G.W. Imbens, D.B. Rubin, Identification of causal effects using instrumental variables, *J. Am. Stat. Assoc.* 91 (1996) 444-455.
- [40] J. Hahn, J. Hausman, Weak instruments: Diagnosis and cures in empirical econometrics, *Am. Econ. Rev.* 93 (2003) 118-125.

**Appendix A. Propensity score estimation**

Probit regression	Number of obs	=	3029
	LR chi2(5)	=	105.84
	Prob > chi2	=	0.0000
Log likelihood = -1628.0775	Pseudo-R2	=	0.3150

---

tayssir	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
indice	-.2230554	.0268314	-8.31	0.000	-.2756439 -.1704669
Age	.0172289	.0090001	1.91	0.056	-.0004109 .0348687
DAMP	-8.65e-06	4.61e-06	-1.87	0.061	-.0000177 3.93e-07
Sexe	.0378695	.050597	0.75	0.454	-.0612987 .1370378
Distance	-.0000438	.000015	-2.93	0.003	-.0000731 -.0000145
_cons	-.2667622	.1447509	-1.84	0.065	-.5504688 .0169444

**Appendix B. Variables used in the MCA technique.**

Variable	Modality
Votre ménage possède-t-il des terres agricoles ?	Oui
	Non
Type de logement	Villa ou niveau de villa
	Appartement dans un immeuble
	Maison marocaine traditionnelle
	Maison marocaine moderne
	Chambre dans une institution
	Baraque ou logement de bidonville
	Local non destiné à l'habitation
	Logement de type rural
Type principal de toit	Dur
	Tuiles
	Bois
	Zinc
	Paille
Type de murs	Briques
	Pierres
	Bois
	Zinc
	Tabia
	Paille roseaux
	Pierres sèches
Statut d'occupation	Propriétaire Copropriétaire
	Accédant à la propriété
	Locataire avec pas de porte
	Locataire sans pas de porte
	Hypothèque avec ou sans loyer
	Logement de fonction
	Logé gratuitement

Variable	Modality
Type de sol	Carreaux, mosaïques
	Ciment
	Argile, terre
	Sable
Mode d'acquisition du logement	Construit sans crédit
	Construit avec crédit
	Achat au comptant
	Achat à crédit
	Héritage
Y a-t-il une cuisine dans la partie de logement occupée par votre ménage ?	Oui privée
	Oui partagée
	Non
Y a-t-il une salle de bain ou douche dans la partie de logement occupée par votre ménage ?	Oui privée
	Oui partagée
	Non
Y a-t-il des WC dans la partie de logement occupée par votre ménage ?	Oui privé
	Oui partagé
	Non
Quel moyen utilisez-vous pour l'éclairage	Réseau d'électricité
	Pétrole lampant
	Butane
	Bougies
	Energie solaire
	Batterie
Quel moyen utilisez-vous pour l'eau potable ?	De chez les voisins
	Fontaine
	Puits
	Source, rivière
	Citerne d'eau
	Réseau d'eau potable avec compteur
	Réseau d'eau potable sans compteur
Comment vous débarrassez-vous des eaux usées ?	Réseau d'égouts
	Fosse septique
	Dans la nature

#### Appendix C. Standardized difference test

Variable	Unmatched		Mean		%reduct		t-test		V(T) / V(C)
	Matched	Treated	Control	%bias	bias	t	p> t		
indice	U	2.1595	2.5466	-39.6		-9.17	0.000	0.85*	
	M	2.1595	2.1629	-0.3	99.1	-0.07	0.945	0.99	
Age	U	10.828	10.593	8.5		1.95	0.051	0.79*	
	M	10.828	10.762	2.4	71.7	0.46	0.647	0.77*	
Sexe	U	1.5027	1.4886	2.8		0.66	0.506	1.00	
	M	1.5027	1.4973	1.1	61.5	0.21	0.835	1.00	
DAMP	U	9340.5	10370	-17.5		-4.05	0.000	0.86*	
	M	9340.5	9248.7	1.6	91.1	0.32	0.748	1.13	
Distance	U	1086.5	1617.5	-12.6		-2.49	0.013	0.08*	
	M	1086.5	1055.8	0.7	94.2	0.38	0.703	1.35*	

\* if variance ratio outside [0.87; 1.16] for U and [0.87; 1.16] for M.

