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Ex ante impact evaluation of conditional cash transfer program on school attendance and poverty: the case of the Philippines*

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This paper provides an ex ante assessment of the implementation of the conditional cash transfer (CCT) program in the Philippines, called Pantawid Pamilyang Pilipino. The study investigates the impact of CCT on current poverty and that of this extra money on school attendance under different transfer amounts and different targeting criteria such as universal targeting, geographical targeting, targeting of the poor, and progressive targeting. In the poverty simulation approach, it is assumed that transfers given to children are pooled within families and distributed to each member so that all enjoy the same level of welfare. As for school attendance, the study evaluates the potential impact of changes in program design—with alternative benefit levels and targeting scenarios—on the behavioral response and welfare of households. The simulation is carried out based on microeconometrically estimated models of household behavior.

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1. Introduction

Conditional cash transfer (CCT) programs are regarded as a leading-edge social-policy tool for their ability to influence both the income of the poor in the short run and to improve their human capabilities in the medium and long run. CCT programs have also been lauded for their ability to focus on the

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poor and easily integrate different types of social services (such as education, health, and nutrition), and for their cost effectiveness. Furthermore, they can prevent price distortions that may stem from policies such as food and energy subsidies.

Conditional cash transfer programs have been shown to be quite successful in Latin American countries and are increasingly perceived as effective for poverty reduction. Well-known programs that follow this approach include the Progresa (now called Oportunidades) in Mexico, Bolsa Escola and Bolsa Familia in Brazil, Red de Proteccion Social in Nicaragua, Programa de Asistencia Familiar in Honduras, Program of Advancement through Health and Education in Jamaica, Food-for-Education in Bangladesh, and Subsidio Unico Familiar in Chile [de Janvry and Sadoulet 2006]. In 2007, the Philippines piloted a CCT program in four provinces, and since January 2008 has implemented this program nationwide.

While there is no guarantee that the success of CCT programs in some countries can be replicated in others, the previous cases provide a strong case for the effectiveness of CCT.[1] The various forms of CCT implemented by other countries provide an array of good practices from which other countries can learn. Alternatively, a good starting point investigating CCT programs is to perform a detailed ex ante evaluation of the possible impact of such programs. However, one should always be aware that many relevant questions about the design of the program can only be answered by ex post impact evaluations.

An ex ante evaluation may help policymakers decide on key design elements of the CCT, such as the order of magnitude of the necessary transfers for the desired impact, and the targeted areas and population. It also offers an idea of the potential impact one can expect given the design of the program. This study aims to contribute in this area, offering a first approximation of the impacts of a CCT program on school attendance and poverty in the Philippines by exploring different budget scenarios and targeting strategies. This study is limited to demand aspects. Due to lack of readily available data, we do not look into the availability and quality of schooling facilities. Therefore, we have no choice but to assume that supply-side constraints, including quality of schools, are already resolved.

The paper is organized as follows. Section 2 presents the methodology. Section 3 is devoted to describing the CCT program in the Philippines, called Pantawid Pamilyang Pilipino (PPP). Section 4 provides discussion of the empirical results. Section 5 concludes the study.

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[1]For example, see Ravallion and Wodon [2000] for the effects of the Food-for-Education program in Bangladesh, and Parker and Skoufias [2000] and Schultz [2000] for the impacts of Progresa in Mexico.

2. Methodology

2.1. Conceptual framework

In this paper, it is assumed that the decision to send children to school is based on the household decision process. The analysis in the paper is based on three alternative choices. Let C_i be a qualitative variable representing the alternative choice made for a child in the ith household such that

$C_i = 1$ if the child does not attend school

$C_i = 2$ if the child goes to school and also works in the labor market

$C_i = 3$ if the child goes to school but does not work in the labor market

When $C_i = 3$, it does not preclude the possibility that the child makes a contribution to unpaid domestic work at home. We make an assumption that the variable C_i is determined according to household socioeconomic and demographic circumstances. However, we do not account for how decisions about these occupational choices are made within households. Cultural factors may determine whether or not a child should study full-time or part-time, or not study at all. We focus only on some observable factors that are likely to impact on household behavior regarding children's education.

It is further assumed that the household decision to send children to school (C_i) is made based on a utility function determined by household socioeconomic and demographic characteristics. Suppose u_{ij} is the utility of the ith household when it makes a choice that $C_i = j$, where j varies from 1 to 3. A household makes a choice on the basis of maximum utility it derives from that choice. For instance, the ith household will choose $C_i = 2$ in preference to $C_i = 1$ if $u_{i2} > u_{i1}$.

The utility function depends on a number of factors including characteristics of children such as age, gender, previous schooling, and their potential earnings. Some household characteristics also influence the utility function, including age and gender of the household head, education of parents, household size and composition, and presence of younger siblings in the household. We can put all these variables together in a row vector z_i.

The most important variable that affects the occupational choice of a child is the household income, which is the sum of household income (net of the child's earnings) and the child's potential income. Suppose X_i is the household income (without the child's earnings) and x_i is the potential income of the

child. Accordingly, the household choice will depend on the sum $(X_i + x_i)$. Therefore, the utility function of the *i*th household making the jth choice can be written as

$$u_{ij} = z_i\lambda_j + (X_i + x_i)\alpha_j + e_{ij} \quad (1)$$

The potential child contribution to the household income denoted by x_i is an important variable that determines the household decision about child occupational choice. This contribution depends on how much the child can earn in the labor market and also how much he/she can contribute to the household domestic work. The child contribution to domestic work is not known, and needs to be imputed. The imputation of monetary value on domestic work has many pitfalls, and requires strong assumptions. We have used the following methodology.[2]

Suppose w_i is the actual earning of the child in the *i*th household and A_i is a row vector of the child characteristic. Following Becker-Mincer human capital model, the earnings function is estimated by

$$\log(w_i) = A_i\delta + D_i m + \varepsilon_i \quad (2)$$

where D_i is a dummy variable that takes the value 1 when $C_i = 2$, and 0 otherwise (i.e., when $C_i = 1$). Note that children who are studying full-time and not working in the labor market—for which $C_i = 3$—have been excluded because they do not earn any income in the labor market. Further note that the parameter m is expected to be negative because with given individual characteristics of the child (A_i), a child who is studying and working is expected to earn less than one who is not studying but only working. This implies $M = \exp(m) < 1$.

The potential earnings of a child are determined by the expected or predicted value of w_i obtained from equation (2), which gives us the following:

$$\begin{aligned} \hat{w}_i &= \exp(A_i\hat{\delta}) \text{ if } C_i = 1 \\ &= \hat{M}\exp(A_i\hat{\delta}) \text{ if } C_i = 2 \\ &= K\exp(A_i\hat{\delta}) \text{ if } C_i = 3 \end{aligned} \quad (3)$$

where $\hat{M}\exp(\hat{m})$. For $C_i = 3$, while a child is studying full-time and not working in the labor market, he/she may be performing domestic work. Given the individual characteristic vector A_i, the child has the potential to earn

[2]A similar methodology is applied to evaluate the impact of Bolsa Escola in Brazil. See Bourguignon, Ferreira, and Leite [2002] for a detailed explanation of the methodology.

$\exp(A_i\delta)$ income if he/she is working in the labor market. Since the child is performing only domestic work, his/her domestic work is assumed to be valued at $K\exp(A_i\hat{\delta})$, where K is greater than 0 but less than 1.

Substituting $x_i = \hat{w}_i$ from equation (3) into (1) gives

$$u_{ij} = z_i\gamma_j + X_i\alpha_j + \hat{x}_i\beta_j + e_{ij} \tag{4}$$

where

$$\hat{x}_i = \exp(A_i\hat{\delta}), \quad \beta_1=\alpha_1, \quad \text{and} \quad \beta_3=\alpha_3 K \tag{5}$$

Equation (4) provides the utility of the *i*th household under different occupational choices made for its children. If the values of parameters α, β, λ and residuals are known, we can determine the household choices using equation (4).

2.2. Estimating the model

As mentioned earlier, the *i*th household will make a choice 2 in preference to choice 1 if $u_{i2} > u_{i1}$. Let us define a dummy variable $y_{i2} = 1$ if $u_{i2} > u_{i1}$ and 0, otherwise. Thus,

$$\begin{aligned}\Pr(y_{i2}=1) &= \Pr(u_{i2} > u_{i1}) \\ &= \Pr\left[(e_{i1}-e) < z_i(\lambda_2-\lambda_1) + X_i(\alpha_2-\alpha_1) + x_i(\beta_2-\beta_1)\right] \\ &= F\left[z_i(\lambda_2-\lambda_1) + X_i(\alpha_2-\alpha_1) + x_i(\beta_2-\beta_1)\right]\end{aligned} \tag{6}$$

where F(.) is the probability distribution function.

Similarly, if the *i*th household makes a choice 3, then we have

$$\begin{aligned}\Pr(y_{i3}=1) &= \Pr(u_{i3} > u_{i1}) \\ &= \Pr\left[(e_{i1}-e_{i3}) < z_i(\gamma_3-\gamma_1) + X_i(\alpha_3-\alpha_1) + x_i(\beta_3-\beta_1)\right] \\ &= F\left[z_i(\gamma_3-\gamma_1) + X_i(\alpha_3-\alpha_1) + x_i(\beta_3-\beta_1)\right]\end{aligned} \tag{7}$$

Equations (6) and (7) imply that multinomial logit estimation permits identification of only differences $(\gamma_j-\gamma_1)$, $(\alpha_j-\alpha_1)$, and $(\beta_j-\beta_1)$, where $j = 2$ and 3. We can also estimate the residuals $(e_{i1}-e_{i2})$ and $(e_{i1}-e_{i3})$.

The choice 1 is assumed to be the reference choice. These equations provide linkages between the probability of a choice and the utility of the choice: the larger the $\Pr(y_{ij}=1)$, the greater the household utility u_{ij}. While utility cannot be measured directly, we can still say whether the household utility would be maximized when the household makes a choice.

The following parameters can be estimated directly by applying multinomial logit model to equations (6) and (7):

$$\hat{a}_2 = \alpha_2 - \alpha_1 \text{ and } \hat{\alpha}_3 = \alpha_3 - \alpha_1 \tag{8}$$

$$\hat{b}_2 = \beta_2 - \beta_1 \quad \text{and} \quad \hat{b}_3 = \beta_3 - \beta_1 \tag{9}$$

$$\hat{c}_2 = \gamma_2 - \gamma_1 \quad \text{and} \quad \hat{c}_3 = \gamma_3 - \gamma_1 \tag{10}$$

$$\hat{v}_{i2} = (e_{i2} - e_{i1}) \quad \text{and} \quad \hat{v}_{i3} = (e_{i3} - e_{i1}) \tag{11}$$

Using equations (8) to (11) in conjunction with equations in (5) gives rise to

$$\hat{\alpha}_1 = \frac{M\hat{a}_2 - \hat{b}_2}{1-M}$$

$$\hat{\alpha}_2 = \frac{\hat{a}_2 - \hat{b}_2}{1-M}$$

$$\hat{\alpha}_3 = \hat{a}_3 + \hat{a}_1$$

To perform various simulations, the estimates required are $\hat{a}_1$, $\hat{a}_2$, $\hat{a}_3$, $\hat{b}_2$, $\hat{b}_3$, $\hat{c}_2$, $\hat{c}_3$, $\hat{v}_{i2}$, and $\hat{v}_{i3}$, which can be obtained from the above equations.

2.3. Simulations

Having estimated the model, we can now perform alternative simulations using the utility function given in equation (4). Given that a household makes its three alternative choices based on the utility function, we can write the following:

$$u_{i1} = z_i\hat{\gamma}_1 + X_i\hat{\alpha}_1 + \hat{x}_i\hat{\beta}_1 + \hat{e}_{i1}$$

$$u_{i1} = z_i\hat{\gamma}_1 + X_i\hat{\alpha}_1 + \hat{x}_i\hat{\beta}_1 + \hat{e}_{i1}$$

$$u_{i3} = z_i\hat{\gamma}_3 + X_i\hat{\alpha}_3 + \hat{x}_i\hat{\beta}_3 + \hat{e}_{i3}$$

The *i*th household will choose *j* if the utility obtained from this choice is greater than that obtained from other choices:

$C_i = 1$ if $u_{i1} > u_{i2}$ and $u_{i1} > u_{i3}$

$C_i = 2$ if $u_{i2} > u_{i1}$ and $u_{i2} > u_{i3}$

$C_i = 3$ if $u_{i3} > u_{i1}$ and $u_{i3} > u_{i2}$

Suppose we want to simulate the impact of giving transfer T to all children who are studying and also working in the labor market. The income of households with children studying and working in the labor market increases by amount T, which changes the utility u_{i2} to u_{i2}^*:

$$u_{i2}^* = z_i \hat{\gamma}_2 + (X_i + T)\,\hat{\alpha}_2 + \hat{x}_i \hat{\beta}_2 + \hat{e}_{i2}$$

With this policy, all households will change their behavior and make new choices denoted by C_i^* such that

$C_i^* = 1$ if $u_{i1} > u_{i2}^*$ and $u_{i1} > u_{i3}$

$C_i^* = 2$ if $u_{i2}^* > u_{i1}$ and $u_{i2}^* > u_{i3}$

$C_i^* = 3$ if $u_{i3} > u_{i1}$ and $u_{i3} > u_{i2}^*$

Using this methodology, any simulation scenario can be evaluated. This methodology can also be used to simulate the impact of means testing, i.e., giving transfers to only poor households and not to nonpoor ones.

3. The Pantawid Pamilyang Pilipino program[3]

The Pantawid Pamilyang Pilipino (PPP) program has been implemented since January 2008. It became nationwide after going through a piloted program mode between June and December 2007. Around 300,000 households are currently targeted under the PPP program, which aims to provide money to extreme poor households to allow the family members to meet certain human development goals set by the government. Its prime focus is to build human capital—health/nutrition and education—of children aged below 15 years from the poorest families. In the Philippines, studies have found a strong correlation between low schooling and high malnutrition and poverty.[4] The main objectives of the PPP program include (a) increasing enrollment/attendance of children at

[3]The authors thank the Department of Social Welfare and Development for providing information on the PPP program.

[4]Other objectives are to improve preventive health care of pregnant women and young children, and to encourage parents' participation in the growth and development of young children, as well as involvement in the community.

the elementary level and (b) reducing poverty. This study attempts to evaluate the CCT program in terms of these two objectives.

The beneficiaries of the PPP program are poor households, which the PPP hopes to reach in three steps. First, the poorest 36 provinces are selected based on official poverty lines after which the poorest municipalities from the selected provinces are further chosen using the small area estimation method. The second step involves the administration of total enumeration of households in identified municipalities. Third, the poorest households are selected using a proxy means testing that assesses household socioeconomic characteristics such as ownership of assets, type of housing units, level of educational attainment of household head, and access to water and sanitation facilities. According to the program, the poorest households with children aged 6-14 years qualify for the PPP program, provided that the children are enrolled in schools and regularly attend classes. The minimum rate of school attendance is set at 85 percent, and schools are supposed to report the attendance rate of program beneficiaries to the respective municipal governments. The monthly benefit is Php 300 per child attending school for ten months, up to a maximum of three children per household. Transfers are generally handed to the most responsible adult person in the household, and are credited to the cash card facility of the Land Bank of the Philippines. According to the experience of the Bolsa Escola in Brazil, banking facilities such as magnetic cards greatly facilitate the monitoring of the whole program.

In addition to the education component, the PPP program also has a health component, under which the selected households are given cash grants on the following conditions: (a) pregnant women must get prenatal care starting from the first trimester and get postnatal care thereafter; (b) childbirth is attended by a skilled/trained professional; (c) parents/guardians must attend family planning sessions/mother's class, parent effectiveness service, and other services; and (d) children under five years old must get regular preventive health checkups and vaccines. The health package provides a beneficiary household Php 6,000 per year. In this study, we have not considered the impact of the health component of the PPP program on health and nutritional status. This is due mainly to the availability of appropriate data.

Since the CCT program is relatively recent in the Philippines, it may be hard to estimate the total costs of administering the program. But the CCT programs are not inexpensive to administer, particularly during the initial period of implementation. Much of the budget is spent on undertaking targeting of transfers and monitoring the recipients' actions. However, administrative costs will spread over the implementation of the programs, and their ratio to total transfers is expected to fall rapidly over the years.

To reduce administrative costs, program designers may opt to reduce expenditures on targeting. Yet, severely weakened targeting performance may result in large leakage of benefits to the nonpoor, and thus may endanger the prime objective of the program. The importance of targeting should not be overlooked for a program such as PPP, which is precisely meant for the poorest of the poor. In addition, monitoring conditionality is also part of the administrative costs in implementing a CCT program. Of the total administrative costs of CCT programs, about 9 percent was devoted to monitoring in Honduras, and roughly 2 percent in Mexico. Determining optimal levels of resources to monitor conditionality is a difficult task, and will vary with local circumstances.

To illustrate the magnitude of administrative costs, experiences by Progresa and Bolsa Escola could be useful. In Mexico, during the first year of implementation of the Progresa in 1997, the cost of targeting represented 65 percent of the total cost of the program, followed by monitoring at 8 percent, and actual delivery of transfers at 8 percent of the total. By 2000, the major component was the actual transfers (41 percent), followed by monitoring of conditionality (24 percent), then targeting costs (down to 11 percent).

4. Empirical illustration

The methodology outlined in section 2 is applied to the Philippines. For this purpose, we have used the latest Annual Poverty Indicator Survey (APIS) conducted in 2004, obtained from the National Statistics Office in Manila. The APIS is a nationwide survey designed to provide poverty indicators at the provincial level. This household survey is micro-unit recorded.

The APIS gathers information on various aspects of well-being for all of the Philippines' 78 provinces, including the cities and municipalities of Metro Manila. It provides detailed information on demographic and economic characteristics; health status and education of family members; awareness and use of family planning methods; housing, water, and sanitation conditions of families; availability of credit to finance family business or enterprise; and family income and expenditures. The 2004 APIS collected these data from more than 38,000 households and 190,000 individuals across the country.

In defining the poor, we have used the official poverty lines of the Philippines at the provincial level.[5] If per capita household expenditure/income is less (greater) than the poverty threshold, all members living in the household are classified as poor (nonpoor).

[5]See NSCB [2000] for detailed explanations on the official poverty lines.

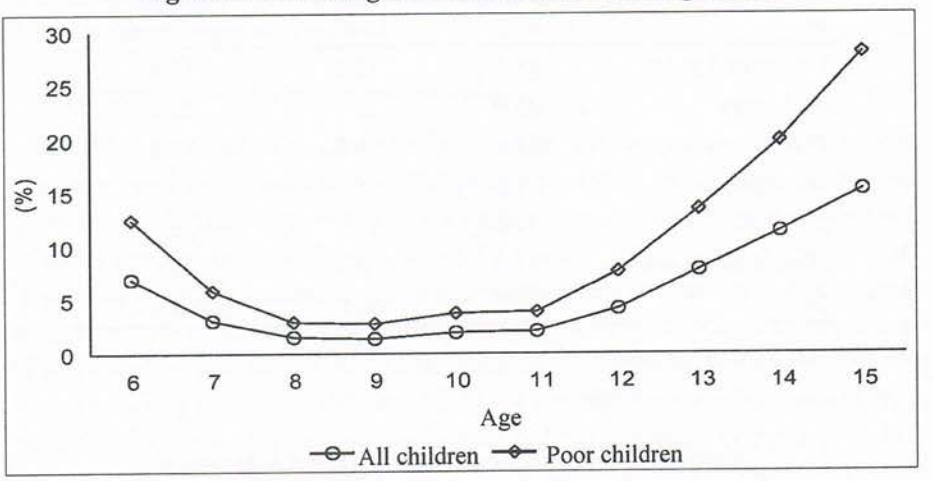
4.1. A profile of the children

Elementary and secondary school-age children—i.e., from 6 to 15 years old—make up almost 25 percent of the total population in the Philippines. Out of about 20 million children in this age group, 2 million—equivalent to 10 percent—fail to attend school. The pattern in the proportion of children not attending school by age exhibits a U-shaped curve, falling from age 6 to 8 years, being steady between 8 and 11 years old, and then rising sharply afterward (Figure 1). While the same pattern emerges for poor children, the proportion of children outside school is greater than the average. More important, a greater proportion of children at the secondary school-age group (i.e., 12-15 years old) stay out of school than their younger counterparts. This finding indeed suggests that opportunity costs of sending children to school are higher at the secondary than the elementary level. This also implies that financial incentives such as CCTs could be more effective for targeting older children if its main objective is to improve school enrollment.

Interestingly, the Philippines' elementary education system provides an impressively wide access to children aged 6-11 years. More than 94 percent of school-age children attended elementary school in 2004. However, the proportion of school attendance by children aged 12-15 years drops at the secondary level, i.e., 84 percent. This stems from lack of personal interest (43 percent), affordability (27 percent), and employment (9 percent) as illustrated in Figure 2. At the elementary level, the main reason for not attending school is also lack of personal interest (30 percent). The lack of interest results in turn from a number of factors that discourage students to study, including inadequate curriculum, unqualified teachers, lack of learning materials, parents' perception about schooling, and social and cultural barriers. Nevertheless, using household survey data and school data, there is little direct evidence in the Philippines of the impact of improved school quality on school enrollment.

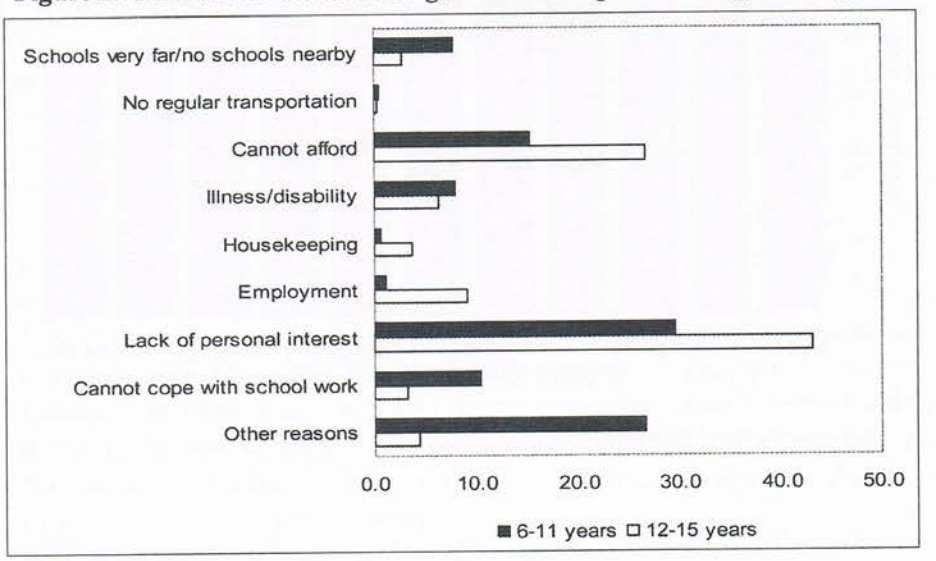
We now look into poverty among children. Table 1 shows that the incidence of poverty among children aged below 15 years is far higher than the national average (see also Figure 3). In particular, poverty is highest for the 6-11 year-old age group, almost 12 percentage points higher than the national average. Poverty among children aged 6-15 years accounts for more than 30 percent of aggregate poverty.

Figure 1. Percentage of children not attending school



Source: Authors' estimates.

Figure 2. Reasons for not attending school among children aged 6-15 years



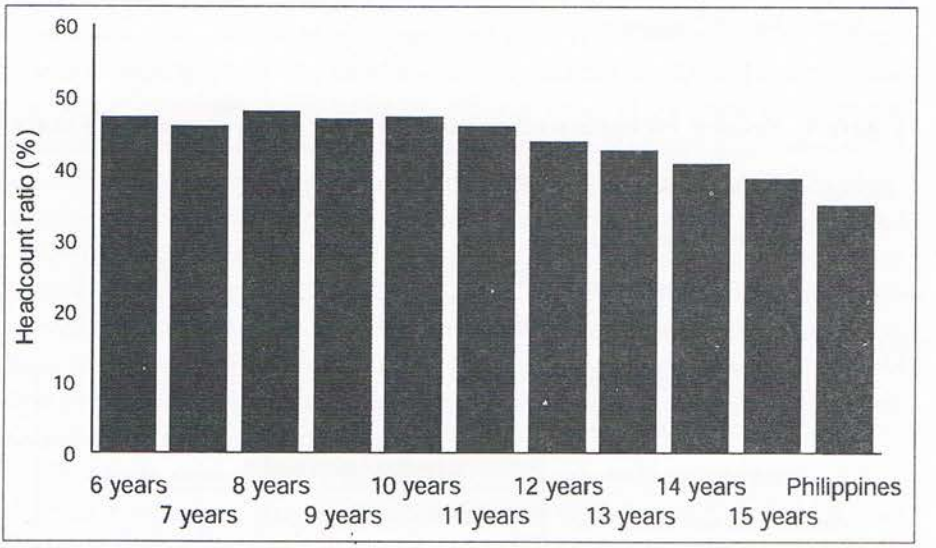
Source: Authors' estimates.

Table 1. Percentage of poor by age groups

Age group	*Headcount ratio*	*Population share*	*% Contribution to total poverty*
Less than 5 years	45.4	13.8	17.8
6-11 years	46.9	15.1	20.2
12-15 years	41.6	9.8	11.6
16-24 years	29.6	16.2	13.7
25-59 years	29.4	38.3	32.1
More than 60 years	23.6	6.9	4.6
Total	35.1	100.0	100.0

Source: Authors' estimates.

Figure 3. Poverty among children aged 6-15 years



Source: Authors' estimates.

About 74 percent of children not attending school are found to be living below the national poverty threshold. This suggests that children are not attending school primarily due to their lack of resources to afford schooling, directly or indirectly, and/or due partly to supply-side factors such as unavailability of nearby schools. Therefore, assuming that supply-side concerns

are properly dealt with, improving school attendance in the Philippines may require a good calibration of the amount of resources transferred, and a well-crafted conditionality in order to effectively induce children from low-income households to go to school.

4.2. Descriptive statistics and simulation results

Table 2 contains the basic description of the occupational structure of children aged 6-15 years in the Philippines in 2004. In this age range, 90.6 percent of children report that they dedicate themselves solely to studying. While 4 percent both study and work, 5.5 percent do not attend school at all. This average pattern hides considerable variation across ages: school attendance declines (and work increases) monotonically with age. Only 0.1 percent of 6-year-olds do not attend school because of working outside the home; the corresponding figure for 15-year-olds is 9.4 percent. In a similar context, 92.2 percent of 6-year-olds devote themselves only to studying, compared to 77.7 percent of 15-year-olds. These findings suggest greater opportunity costs incurred from attending school among older children.

Table 3 presents the mean individual and household characteristics of those children by different categories. Children not going to school are both older and less educated than those solely studying. Moreover, children not going to school are mostly male and also the eldest in a household. As expected, households with children not studying are, on average, poorer, less educated, male-headed, and larger than households with children currently attending school. Incidences of not studying and of engaging in child labor are relatively greater for households with older heads and located in the Visayas or the Mindanao region.

Table 4 presents the results of the weighted least square estimation of the earnings function for the pooled sample.[6] In the model, an additional year of age increased earnings by approximately 18 percent. The coefficient for the dummy variable of studying and working reveals that if a child attends school and works at the same time, his/her average earnings are far less than those by a comparable child who is solely working outside the home. The results also reveal that education matters for higher earnings, and that if a child lives in the Visayas or Mindanao, his/her earnings are significantly less than those by a comparable child living in Luzon.

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[6]The estimated earnings function was not corrected for a selection bias. One of major reasons for this is related to choosing an instrumental variable that would affect earnings but not the occupational choice. No such an instrument is readily available (see Bourguignon, Ferreira, and Leite [2002]).

Table 2. School attendance and occupation of children by age (%)

	Total	6	7	8	9	10	11	12	13	14	15
ALL CHILDREN											
Not studying & working outside home	2.3	0.1	0.2	0.1	0.3	0.7	0.9	1.9	3.4	6.5	9.4
Not studying & working at home & others	3.2	6.9	3.0	1.4	1.2	1.3	1.3	2.4	4.4	5.0	6.0
Studying & working	4.0	0.8	1.1	1.7	2.5	3.7	4.6	5.7	5.8	7.5	7.0
Studying only	90.6	92.2	95.8	96.8	96.0	94.3	93.2	90.1	86.4	81.1	77.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
POOR CHILDREN											
Not studying & working outside home	3.9	0.2	0.3	0.3	0.6	1.3	1.6	3.5	6.3	8.6	17.7
Not studying & working at home & others	5.4	12.3	5.5	2.7	2.2	2.5	2.3	4.2	7.2	11.3	10.4
Studying & working	5.7	1.2	1.8	2.5	3.3	5.6	7.1	8.9	8.4	10.9	8.7
Studying only	85.0	86.3	92.4	94.5	93.9	90.6	89.0	83.4	78.1	69.2	63.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Authors' estimates.

Table 3. Sample means: characteristics of children and the household

	Total	*Not studying*	*Working & studying*	*Studying*
CHILD CHARACTERISTICS				
Age	10.48	12.01	12.06	10.32
No formal education (%)	0.16	0.26	0.07	0.16
With elementary education (%)	0.66	0.64	0.65	0.66
With secondary education (%)	0.18	0.10	0.28	0.18
Male (%)	0.52	0.66	0.60	0.50
Oldest male (%)	0.25	0.42	0.35	0.24
Children's earnings (6 months)				
6-15 years old	3853	5297	2159	–
12 years old	2672	4134	1750	–
13 years old	2912	3606	2121	–
14 years old	4238	5797	2195	–
15 years old	5183	6073	3294	–
HOUSEHOLD CHARACTERISTICS				
Total income (6 months)	69835	36321	42746	72770
Family size	5.66	6.24	5.99	5.61
Visayas (%)	0.20	0.23	0.30	0.20
Mindanao (%)	0.24	0.34	0.38	0.23
Luzon (%)	0.56	0.43	0.32	0.57
Age of head	44.03	45.15	45.34	43.90
Gender of head (male) (%)	0.88	0.92	0.90	0.88
Head with no formal education (%)	0.03	0.09	0.03	0.02
Head with elementary education (%)	0.47	0.69	0.64	0.44
Head with secondary education (%)	0.37	0.19	0.27	0.38
Head with tertiary education (%)	0.13	0.03	0.06	0.16

Source: Authors' estimates.

Table 4. Log earnings regression (6-15 year-old children reporting earnings)

	Coefficient	*Robust std. error*	$P>\|z\|$
Age	0.180*	0.026	0.0000
Studying and working	-0.957*	0.084	0.0000
Education at elementary	0.331	0.183	0.0710
Education at secondary	0.463*	0.209	0.0270
Male	0.115	0.080	0.1520
Visayas	-0.296*	0.092	0.0010
Mindanao	-0.531*	0.084	0.0000
Constant	5.395*	0.350	0.0000
R^2 = 0.309			

*Statistically significant at 5 percent.

Source: Authors' estimates.

The results from the estimation of the multinomial logit for occupational choice also appear eminently plausible. They are reported in Table 5 for the pooled sample. The reference category is "not studying" $(j=1)$ throughout. As expected, household income (net of the child's earnings) has a positive effect on schooling, whereas the child's own predicted earnings have a negative effect. Household size reduces the probability of studying, compared to the reference category. Previous schooling at a given age has a positive effect. Gender has a significant effect on occupational choice, suggesting that a male child is more likely to choose the option of "studying and working" than the reference category, whereas a female child is more likely to opt for "solely studying" rather than "not studying". Parents' education has a positive effect on children's schooling albeit decreasing at higher levels of children's education. Geographical location also has a significant effect on household decisions on children's schooling. Living in Mindanao reduces the probability of children solely studying, compared to the reference category.

Table 5. Multinomial logit coefficients

	Studying and working			*Studying*		
	Coefficient	*Robust std. error*	$P>\|z\|$	*Coefficient*	*Robust std. error*	$P>\|z\|$
Total household income net of children's ('000)	0.004	0.000	0.019	0.015	0.000	0.000
Potential children's earnings	-1.046	0.000	0.000	-0.973	0.000	0.000
Household size	-0.042	0.023	0.070	-0.111	0.016	0.000
Age of child	0.046	0.041	0.262	-0.268	0.028	0.000
Head with no formal education	-1.652	0.286	0.000	-1.822	0.181	0.000
Head with elementary	-0.593	0.203	0.004	-1.293	0.154	0.000
Head with secondary	-0.346	0.209	0.098	-0.628	0.158	0.000
Age of head	0.007	0.004	0.087	0.003	0.003	0.287
Gender of head (male)	-0.022	0.139	0.874	-0.124	0.095	0.191
Number of children below 6 years old	0.004	0.052	0.934	-0.066	0.034	0.051
Gender of child (male)	0.274	0.087	0.002	-0.170	0.062	0.006
Oldest and male child	-0.160	0.090	0.075	-0.150	0.068	0.027
Previous schooling at elementary	2.888	0.144	0.000	3.031	0.091	0.000
Previous schooling at secondary	5.416	0.207	0.000	5.722	0.150	0.000

Table 5. Multinomial logit coefficients (continued)

	Studying and working			*Studying*		
	Coefficient	*Robust std. error*	$P>\|z\|$	*Coefficient*	*Robust std. error*	$P>\|z\|$
Mindanao	-0.507	0.166	0.002	-1.183	0.105	0.000
Visayas	-0.052	0.133	0.696	-0.659	0.091	0.000
Constant	-0.639	0.377	0.090	6.975	0.261	0.000
Pseudo R-square	0.195					
ESTIMATES OF PARAMETERS						
M	0.384					
α_1	1.70					
α_2	1.71					
α_3	1.72					

Source: Authors' estimates.

The parameter M is estimated from taking an exponential of the estimated coefficient of the dummy variable "working and studying" in the earnings function among children. The results are presented in Table 4, i.e., $M = \exp(m)$ where $m = -0.957$. The result suggests that the foregone income of children would be $1-M$ or around 62 percent of their actual or potential market earnings if they attend school while working at the same time. This suggests that with transfer, we might expect no significant changes in the occupational choice from "not studying" to "working and studying" due to high opportunity costs involved in giving up working. Thus, the proportion of children choosing between "working and studying" to "studying only" would be small. In addition, the estimated parameters $\alpha_1 = 1.70$, $\alpha_2 = 1.71$, and $\alpha_3 = 1.72$ are marginal utilities of household income for three occupational categories. It is also of interest that the estimated marginal utilities from income at various categories are similar to each other. These estimates are used for the simulation to evaluate the impact of CCT on school attendance. The simulation results will be discussed in the next section.

4.3. Ex ante impact analysis of CCT on school attendance and poverty

Conditional cash transfers have dual objectives: (a) reducing poverty in the long run through enhancement of capabilities obtained by the conditioning of the cash transfer, and (b) reducing poverty in the short run through cash transfers. The main focus of this section is twofold. First, it develops a multi-logit model that explores the determinants of school attendance. Using this model, we simulate the impact of CCTs on school attendance. Second, it attempts to capture the impact of CCTs on poverty. The impact of different transfer amounts and different target populations on poverty reduction is evaluated. The cash transfers are given to families with school-age children. It must be recognized that all transfers given to families may not be spent solely on children. However, the household surveys do not provide any information on the distribution of resources within households. In the simulation exercise, it is thus assumed that transfers given to children are pooled within families and distributed equally to members so that each member enjoys the same level of welfare.

Table 6 presents the transition matrix. It shows, with transfers, changes in the proportion of children moving from the reference choice to choices "studying and working" or "solely studying", and from "studying and working" to "solely studying". The results are simulated counterfactual distribution of occupational choices, based on the observed characteristics and the restrictions of residual terms for each individual child. The impact of the transfer will be evaluated by comparing the simulated results with the vector of occupational choices generated with the original before the transfer. The corresponding matrix is also shown in the table for all children aged 6-15 years living in poor households.

With the transfer of Php 300, Table 6 suggests that almost one of every three children aged 6-15 years who are currently not attending school would have enough incentive from the transfer to choose to go to school. Among them, about half would attend school but also work outside the home. The other half would stop working to devote themselves to studying only. This would reduce the proportion of children not attending school from 5.81 percent to 1.56 percent. The impact on those currently studying and working is relatively small. About 6.8 percent of these children would choose to study only after abandoning their work outside the home.

As expected, the impacts are more pronounced when the targeted population for the program is children from poor households. The proportion of 6-15 year-old children in poor households is much higher than in nonpoor households: 33 percent for the former and 22 percent for the latter. This is

indeed consistent with an earlier finding that there are more children in poor households [Son 2008]. Table 6 also suggests that the proportion of children out of school is far higher among poor households: 9.37 percent instead of 5.81 percent for all households. More important, the results show that the CCT would be more effective in increasing school attendance among poor children. The simulation suggests that the program could increase school attendance among the poor by about 6.7 percentage points. Yet, this improvement comes with a marginal increase in the proportion of children choosing the "working and studying" category.

A more than 60 percent reduction in the proportion of poor children not attending school would be regarded as a substantial improvement. This is partly due to the fact that the current contributions of children attending school are quite significant in proportion to the potential earnings they would have earned at the labor market. This proportion is closely related to the estimated parameter M, which is equal to 0.384 as discussed earlier (see Table 5).

Our simulations suggest that the transfer of Php 300 per child per month, as currently formulated, would still leave more than 7.5 percent of the 6-15 year-old children not solely studying in school. This motivates us to investigate alternative program parameters that can increase school attendance among children who are solely working instead of studying. This is, in fact, one of the main objectives of carrying out this type of ex ante evaluation exercise. Table 6 presents transition matrices with simulation results for alternative scenarios. The results are shown both for all children and separately for poor households only.

Table 6. Simulated effect of CCT on schooling and working status (when Php 300 is transferred to all children 6-15 years old)

ALL HOUSEHOLDS	*Not studying*	*Work & study*	*Studying*	*Total*
Not studying	26.81	36.03	37.16	5.81
Work & study		93.20	6.80	4.20
Studying			100.00	89.99
Total	1.56	6.01	92.44	100.00
POOR HOUSEHOLDS	*Not studying*	*Work & study*	*Studying*	*Total*
Not studying	28.84	33.56	37.60	9.37
Work & study		92.31	7.69	5.72
Studying			100.00	84.92
Total	2.70	8.42	88.88	100.00

Source: Authors' estimates.

A few key findings emerge from Table 7. First, the results reveal that the impact of the program is responsive to the transfer amount in reducing the proportion of children outside school. Doubling the transfer from Php 100 to Php 200 reduces the percentage of unenrolled children from 44 percent to 37 percent. The proportion of children devoted only to studying rises steadily in response to increasing the transfers from Php 100 to Php 300. This does not come as a surprise because it is hard to improve school enrollment in a country like the Philippines where the school-enrollment rate is already high. Interestingly, the proportion of children in the "work and study" category increases (albeit falling slightly with the transfer amount) with the transfer. This is consistent with our earlier finding that the contribution of children's earnings to household welfare is quite large. As such, a significant proportion of children who are currently working only would enroll with the CCT program but would choose to work at the same time. This suggests that reasons for unenrollment are not only due to lack of resources but also due to household characteristics and quality of schooling.

Table 7. Impact of conditional cash transfer on school attendance

	Before transfer T = 0	*After transfer*					
		T=100	*T=200*	*T=300 Universal*	*Progressive transfer*	*Targeting poor*	*Targeting Mindanao*
ALL HOUSEHOLDS							
Not studying	5.81	3.67	3.28	1.56	1.08	1.41	3.82
Work & study	4.20	6.21	6.12	6.01	5.99	5.26	4.79
Studying	89.99	90.11	90.60	92.44	92.93	93.33	91.39
POOR HOUSEHOLDS							
Not studying	9.37	6.17	5.68	2.70	1.98	–	5.81
Work & study	5.72	8.76	8.61	8.42	8.39	7.98	6.69
Studying	84.92	85.07	85.71	88.88	89.63	92.02	87.50

Source: Authors' estimates.

Second, it does matter to the reduction of unenrolled children whether a given transfer is uniform across ages or increases with the age of the child by 5 percent. Given the opportunity cost of attending school for older children particularly at the secondary level, increasing the transfer amount progressively with the age of the child would seem a better option than uniform transfer. Similarly, targeting poor children is more sensitive to reduction in the proportion of unenrolled children, compared to universal targeting with the same transfer amount. It should be noted, however, that there would be the administrative costs of identifying the poor, which would be part of the program costs. In the initial period of implementing the program, the administrative costs could be substantial, but would decline over the period.

Third, conditionality plays a crucial role in inducing the change in household decisions on children's school enrollment. As could be seen in Table 9, there is a lack of correlation between the level of school attendance and the impact of the cash transfer. This suggests that a cash transfer program without conditionality is not enough to lead to a substantial increase in school attendance.

Using different simulation scenarios, we have attempted to quantify the impact of a transfer on poverty reduction at the national level. As for poverty simulation, it is assumed that transfers given to children are pooled within families and distributed to each member so that every member enjoys the same level of welfare. It is further assumed that all transfers received by families are spent on consumption goods. So the benefits received by the families are added to the family's total consumption expenditure, which, on dividing by household size, gives per capita family expenditure after the transfer. The new poverty estimates are derived using per capita family expenditure after the transfer, which is then compared with the poverty estimates based on the family's per capita expenditure before the transfer.

A few major findings emerge from Table 8. First, the transfer to school-age children has rather small impacts on the headcount ratio, but its impact increases rapidly as we move to the poverty gap ratio and severity of poverty index. Since the severity of poverty gives greater weight to the poor who are living far below the poverty threshold, a larger reduction in this index suggests that the cash transfers have greater impact on poverty reduction among the ultra-poor than the poor. Thus the impact of a CCT program should not be judged merely on the number of people that can be removed from conditions of poverty through the program. In fact, a CCT program provides greater financial relief to those who are still unable to escape from poverty because the extra value of money is much greater for them. The headcount ratio is completely insensitive to any improvement in the standard of living of those who could not be removed from conditions of poverty by such CCT programs.

Table 8. Impact of CCT on poverty reduction (%)

	Universal targeting			*Targeting only poor children*			*Targeting children in Mindanao*			*Cost (% of GDP)*
	Incidence	*Gap*	*Severity*	*Incidence*	*Gap*	*Severity*	*Incidence*	*Gap*	*Severity*	
UNIFORM TRANSFER										
100	-3.8	-9.5	-14.4	-9.3	-20.6	-29.5	-4.6	-12.4	-18.3	0.5%
200	-8.1	-18.6	-26.9	-19.3	-38.2	-50.3	-11.3	-21.4	-27.8	1.0%
300	-12.4	-26.9	-37.6	-31.1	-52.5	-64.3	-17.5	-26.7	-32.3	1.5%
PROGRESSIVE TRANSFER										
100	-3.9	-9.8	-14.6	-9.5	-21.0	-30.2	-4.8	-12.7	-18.8	0.5%
300	-12.9	-27.6	-38.3	-32.3	-53.6	-65.2	-17.9	-27.0	-32.3	1.5%

Source: Authors' estimates.

Table 9. Impact of unconditional cash transfer on school attendance

	Before transfer	*After transfer*					
	T = 0	T=100	T=200	T=300 *Universal*	*Progressive transfer*	*Targeting poor*	*Targeting Mindanao*
ALL HOUSEHOLDS							
Not studying	5.81	5.76	5.73	5.69	5.67	5.61	5.64
Work & study	4.20	4.13	4.07	4.00	4.00	3.96	4.10
Studying	89.99	90.10	90.20	90.31	90.33	90.43	90.26
POOR HOUSEHOLDS							
Not studying	9.37	9.28	9.21	9.16	9.14	8.92	9.06
Work & study	5.72	5.65	5.57	5.43	5.41	5.22	5.53
Studying	84.92	85.07	85.22	85.41	85.44	85.86	85.42

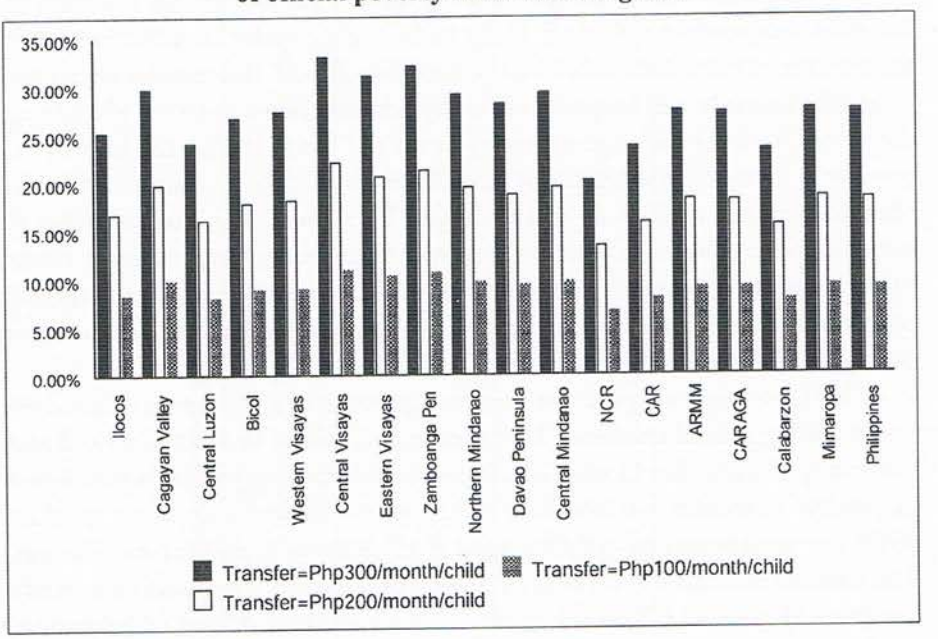
Source: Authors' estimates.

Second, targeting children from poor households leads to much greater poverty reduction at the national level as the per capita benefits received by the poor recipients' families are likely to be higher under targeted programs than universal ones. Nevertheless, the total benefits of the transfer under the targeted programs will be partly offset by administrative costs of identifying the poor. Another message emerging from the study is that the impact on poverty is generally greater if the transfer is given only to children living in Mindanao rather than to all children aged 6-15 years. This suggests that if targeting poor children is likely to bear too much budgetary burden in terms of the administrative costs of identifying the targeted subjects, then targeting only Mindanao children is not an unfounded option in order to achieve a better outcome in poverty reduction relative to the universal program.

Third, our study suggests that the average pattern of outcomes of children not attending school exhibits a U-shaped curve, falling until 11 years old and then rising sharply after 11 years old. Based on this finding, we assess the impact of poverty reduction if 0.5 percent or 1.5 percent of gross domestic product (GDP) is transferred to children aged 6-15 years in a progressive manner. The transfer amount is increased by 5 percent for every extra year of a child's age from 11 years old. This is because children at a higher level of education, particularly at the secondary level, are more likely to drop out of school or to encounter higher opportunity costs from attending school. The simulation results suggest that while the progressive transfer may not be as effective as uniform transfer, it is more effective if only poor children are targeted, than if the universal or geographical targeting method is used.

Fourth, although the transfer programs based on higher transfer amount do have much greater impacts on poverty reduction at the national level, they can be quite expensive and their affordability questionable. With the transfer amount of Php 300 per child per month, the country has to bear a burden equivalent to 1.5 percent of its GDP that will be foregone. This is not a small cost for any country to bear. Nevertheless, the transfer levels that are considered are not sizable enough to have substantial impacts on poverty reduction at the national level. As can be seen in Figure 4, the proportion of the considered transfer amounts is quite small relative to the official poverty lines across regions. With the transfer level equal to Php 300 per month per child, the costs of the program would be merely 27 percent of the average official poverty line for the Philippines.

Figure 4. Costs of the CCT program as percentage of official poverty lines across regions



Source: Authors' estimates.

5. Conclusions

Poverty affects a large proportion of the population in the Philippines where the proportion of poor people has actually increased over the 2003-2006 period. Policies to reduce poverty in the Philippines and elsewhere are defying conventional wisdom. Single-focus solutions have proven ineffective. There is an urgent need to learn from both successful and failed experiences elsewhere. This paper has provided an ex ante assessment of the implementation of the CCT program in the Philippines called the PPP program. In this study, we investigated the impact of the CCT program on current poverty and the impact of this extra money on school attendance under alternative targeting criteria—e.g., universal targeting, geographical and poor targeting, and progressive targeting—and differing values of the transfers.

The key messages emerging from the study could also be regarded as recommendations for countries considering interventions through CCT programs.

First, conditionality plays an imperative role in CCT programs. Cash transfer, by itself, will not suffice to increase school attendance significantly, which means that conditionality would have to be introduced. Possibly also, the quality of schooling would have to be improved when administering any cash transfer programs aimed at a sustained reduction in poverty.

Second, the emphasis on targeting helps maximize the program's impact and effectiveness. The results showed that the targeted CCT program would lead to greater school attendance and poverty reduction. However, targeting and monitoring can increase the cost per beneficiary, which reduces the program's efficiency. However, designing a program with a weak or nonexistent targeting strategy not only reduces the transfer cost per beneficiary but also leads to leakages to the nonpoor, driving down its impact and effectiveness.

Third, to ensure success, complementing CCT programs with other components of social policy may prove meritorious. Complementary programs that can manage the supply side of services—such as high transportation costs and quality of teaching—and accommodate the heterogeneity of targeted household behavior will enhance the effectiveness of CCT programs, including the PPP program in the Philippines.

Fourth, good governance is an important component of a CCT program. As is the case for all effective social safety nets, a CCT program should be transparent in operation to encourage learning, minimize corruption, and ensure that beneficiaries and the wider population understand how the program functions. Corollarily, political support at high levels for the program is one of the main issues to be considered in implementing a CCT program. Such political supports are critical as a CCT program requires coordination across different sectors in the government, particularly education, health, and social welfare.

Finally, it is also imperative to ensure regular monitoring of operations and rigorous evaluation of effectiveness of CCT programs, both ex ante and ex post. Ex ante impact evaluations like the current study would be useful in answering a number of policy-relevant counterfactual questions that ex post evaluations are unable to answer.

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