Efficient delivery of subsidies to the poor: Improving the design of a cash transfer program in Ecuador ☆

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ABSTRACT

Many governments provide monetary transfers to low-income families. The mechanism through which these subsidies are distributed may contain several inefficiencies that diminish the net-value obtained by the recipients. In this paper, we build and estimate a behavioral dynamic model that allows us to evaluate the efficiency of current and alternative distribution mechanisms. The proposed model is simple and resembles the individual's decision to collect the transfer. To estimate it, we use data from a cash transfer program in Ecuador where recipients incur high transaction costs each time they collect their benefits. Despite its simplicity, our model is able to replicate the observed data remarkably well. We use it to simulate alternative payment mechanisms and show that an adequate design of the delivery of payments can substantially increase the value of cash transfer programs.

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1. Introduction

Conditional Cash Transfer (CCT) programs consist of monetary transfers to low income families that aim to alleviate extreme poverty, while providing households with incentives to increase their consumption of education and health services. These type of programs have become an important part of social assistance in Latin America and have dramatically expanded during the past decade.[1]

Many efforts have been made to measure the effects of such transfers on recipients' well-being. Using controlled social experiments, researchers have found that children of families who receive transfers consume more health services, are more likely to attend school, and less likely to be part of the labor force (Behrman et al., 2005; Schady and Paxson, 2007; Schady and Araujo, 2006; and Schultz, 2004, for example).

While these previous studies provide evidence of the overall positive effects that CCT programs have on children's school enrollment and health care, less is known about the benefits or costs associated with the current programs' design. For instance, there are many dimensions in which CCT programs differ (rules about eligibility, conditionality, payment schedules, delivery of the payments, etc.), and there may exist important inefficiencies in program implementation. Todd and Wolpin (2006) and Bourguignon, Ferreira, and Leite (2003) use behavioral models to address this question and simulate and evaluate alternative programs in Mexico's Progresa and Brasil's Bolsa Escola, respectively. Both studies conclude that transfers' conditionality has an important effect on school attendance, and Todd and Wolpin suggest that alternative payment schedules may induce a greater impact on average school attainment.[2]

In this research, we analyze the design of another dimension of CCT programs that, to our knowledge, has not been considered in previous studies. We focus on the mechanism through which governments distribute payments to the beneficiaries. This is an important feature

[1] The first Latin American CCT program started in 1995 in Brazil under the government of the Distrito Federal of Brasilia (Bolsa Escola). The second experience of a CCT program is Mexico's Progresa (now renamed Oportunidades) which began in 1997. Other Latin-American countries that have implemented CCT programs in the past decade include Argentina (Familias por la Inclusion Social), Chile (Chile Solidario), Colombia (Familias en Acción), Costa Rica (Superémonos), Ecuador (Bono de Desarrollo Humano), Honduras (Programa de Asignacion Familiar), Jamaica (Programa de Avance Mediante la Salud y la Educacion), Nicaragua (Red de Protección Social), and Uruguay (Proyecto 300). See Rawlings and Rubio (2003) and Caldés, Coady, and Maluccio (2004) for reviews.

[2] More importantly, Todd and Wolpin provide evidence that these types of models may be able to replicate the counterfactuals of interest reasonably well by comparing the predictions of their model with those derived from a randomized experiment.

of these programs since there may be high transaction costs involved in the distribution of these transfers, such as transportation, opportunity, and other related costs incurred by both governments and recipients. For this reason, an adequate design of the delivery of payments could drastically increase the value of a CCT program.

To address this issue, we specify and estimate perhaps the most basic version of a behavioral dynamic model that resembles the individual's decision to collect the transfer. Unlike other behavioral models in the literature, ours is simple and easy to solve.[3] Despite its simplicity, we show that it may be a powerful tool for designing the delivery of payments of a CCT program.

We focus on one particular CCT program in Ecuador: the *Bono de Desarrollo Humano* (BDH). The program consists of cash transfers to a) low-income mothers with children younger than 16 who receive benefit payments of $15 per month and b) elderly and/or disabled low-income individuals who are entitled to $11.50 per month. As of December 2004, low-income mothers accounted for more than 80% of the total number of beneficiaries. The subsidy is delivered through a payment agency network, composed of 17 financial institutions with approximately 250 payment centers distributed in rural and urban areas of Ecuador. Beneficiaries must travel to one of these agencies and approach the counters/booths to collect their cash. The government provides individuals with the option to cash any -accumulated- subsidy once every one, two, three or four months.

While in most urban areas there is a relative large supply of payment agencies, in many rural areas there is a clear shortage. For instance, in certain rural areas, beneficiaries need to travel for close to two hours to the nearest payment agency. The inefficiency of the program's payment system has been criticized in several government reports which state that, in some cases, the recipients' transportation costs may account for more than 50% of the transfer itself.[4] Partially for this reason, a redesign of the mechanism of the payment's delivery is under consideration.[5] The behavioral model specified in this paper aims to facilitate this task.

The model is simple and intuitive. Each period (month), beneficiaries have the right to receive a lump-sum payment from the government. To receive this payment, households incur transportation costs that are a function of the travel time from their residences to the closest payment agency. Households are heterogeneous in their location and in their opportunity costs. From each individual's perspective, future opportunity costs are random. Given these assumptions, a household rationally chooses between collecting the transfer in the current period or waiting to redeem the accumulated subsidy in the next period. Thus, households that are located closer to payment agencies or that experience lower opportunity costs have stronger incentives to redeem the transfer more often.

We estimate the model using Simulated Maximum Likelihood methods and administrative data provided by the Ministry of Social Welfare in Ecuador. The data consist of subsidy-payment and demographic information from a random sample of approximately 2500 households (mothers) during 2004.[6] The payment data allow us to identify if a beneficiary decided to collect the transfer in any given month and, if so, the amount received. We also observe several characteristics of the mother, such as her geographical location, level of education, and marital status. In addition, we measure beneficiary accessibility to the payment agencies by estimating the travel distance between the town where the beneficiary resides and the closest town with a payment agency.

The structural estimates have a direct economic interpretation. For example, our results suggest that the time-opportunity cost of beneficiaries is close to $0.40 per hour. This is a reasonable estimate considering that the minimum hourly wage in Ecuador was close to $1 in 2004. More importantly, despite the simplicity of our model, we believe that it is able to replicate the observed data remarkably well. For this reason, we use it to conduct several counterfactual experiments of alternative payment mechanisms.

The first counterfactual we consider consists of increasing the number of periods that households are allowed to accrue their payments (from four to six months). Interestingly, the recipient's welfare gains from such a policy are very small. We compute another counterfactual that allows us to quantify the household's welfare effects if the government increases the number of payment agencies in rural locations. In particular, we assume that new payment agencies are built such that the home-to-agency travel time of a representative rural household decreases by 60 min. We estimate that such policy would increase the value of being enrolled in the program by about 4%. Finally, the model is used to create a geographically differentiated schedule of payments that compensates rural households for their travel time-opportunity costs.

In the following section, we present the details of the BDH program. Section 3 contains a detailed description of the data sources, including the estimation of several reduced form specifications. Section 4 presents the model and the estimation methods. In Section 5, we include an economic interpretation of our estimates, an assessment of the within-sample fit, and evaluations of alternative payment programs. Finally, the last section concludes.

2. The BDH program

2.1. Overview

The Bono de Desarrollo Humano (BDH) is a conditional cash transfer program (CCT) in Ecuador administered by the Ministry of Social Welfare. The program consists of monthly cash transfers to low income families. The BDH has two types of beneficiaries: a) low-income mothers with children younger than 16, who receive $15 per month in benefits, and b) elderly and/or disabled low-income individuals, who are entitled to $11.50 per month.

The program is the most important social assistance program in Ecuador and is by far the government's largest social expenditure outside of education, with total transfers equal to nearly 8% of Central Government non-debt spending and about one percent of GDP (León et al., 2001).[7]

The BDH program started in 2003 by merging two previously existing programs, the Bono Solidario (BS) and the Beca Escolar (BE). The BS was designed as a safety net to compensate poor families for the elimination of gas and electricity subsidies in 1998 and targeted mothers with earnings below US$ 40 dollars per month, people with

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[3] In practice, behavioral models are difficult to implement. In particular, as the state space increases, computing the solution to the model involves advanced numerical methods and approximations (Berkovec and Stern, 1991; Keane and Wolpin, 1994, 1997, 2001) that, perhaps, have discouraged many applied researchers to undertake this approach.

[4] Some beneficiaries live in remote areas and travel for about 2 hours to collect the transfer from the nearest payment agency. In a few internal staff reports from the Central Bank of Ecuador (and other local agencies), it is estimated that the average bus fare for such trips is close to $3 per one-way trip. If the opportunity cost of traveling is 50 cents per hour, it is reported that transportation costs alone may account for more than 50 percent of the cash transfer. It is likely, however, that these direct expenses of traveling overestimate the beneficiaries' collection costs for the following reasons. Firstly, it is plausible that beneficiaries travel to urban centers on regular basis for other reasons (to commercialize agricultural products, for example) and use this opportunity to collect their subsidy. Secondly, if rural households organize themselves and send one delegate to collect several cash-transfers, the per-subsidy transportation costs decrease.

[5] At the time we started this study (April 2005), authorities of the Central Bank of Ecuador and the Ministries of Finance and Welfare were considering a redesign of the program.

[6] Because behavior of disabled beneficiaries may be significantly different than that of mothers, we restrict our sample to the latter group.

[7] By comparison, in 2004, Central Government Health expenditures was only 5.9% of total non-debt spending and a bit less than one percent of GDP; public education accounts for two-and-a-half percent of GDP.