RESEARCH PROPOSAL

Household and Individual Consumption decisions under extreme poverty

1. INTRODUCTION

The aim of the proposed research is to study consumption patterns among households in extreme poverty. We plan to study how consumption of different goods such as food, education, health, house services, alcohol and tobacco, changes with income, income sources and prices. Moreover, we want to identify how different members of the household, are affected by given resource changes and examine the extent to which this is linked to the bargaining power of women within the household. We are especially keen to study how children's consumption outcomes vary as household endowments fluctuate.

While the allocation of resources to individuals can be partly studied by looking at the consumption of specific items that are clearly assignable, it is better addressed with information on individual, rather than household, consumption. However, collecting data on individual consumption is notoriously difficult and often limited. When only household data are available, one can use differences in household compositions and consumption, together with some specific assumptions to estimate individual consumption. Some of these assumptions could be relaxed by using partial information on individual consumption. Our contribution, therefore, will partly be a methodological one: we will propose novel extensions to existing techniques for estimating individual consumption from household aggregates. These extensions will aim to make the best use of limited information on individual consumption.

The results of this research will help to design policy tools that alleviate the effects of poverty on household welfare both in the short and in the long run. In particular, they could be crucial for assessing the effect of different types of interventions, ranging from (possibly conditional) cash transfers, to in-kind transfers to price subsidies. Our research will determine, for example, whether or not cash transfers will increase the consumption of food or education rather than alcohol or transport. It will also enable us to identify who in the households will benefit from the acquisition of important food components (say, eggs, meat or milk). Furthermore we should be able to say whether the consumption of specific commodities is more effectively increased by an income transfer or by a price subsidy. In-kind transfers could be a more appropriate poverty alleviation mechanism should we find that neither income nor prices influence consumption decisions in an adequate way, owing perhaps to leakages towards goods that are not considerate adequate, such as alcohol or tobacco.

Income and prices are of course not the only influences on household and children’s consumption. Other variables such as age or parents’ education will also influence consumption choices. In this spirit, we will pay particular attention to the amount of resources controlled by the mother among the determinants of both household and children’s individual consumption. Attanasio and Lechene (2002), for instance, find a positive relationship between the percentage of income earned by the mother and the share of household income spent on food and children’s clothing. This phenomenon is of particular policy relevance as current welfare programs in Mexico, Honduras, Brazil and Colombia aim to improve children’s nutritional status by providing mothers, and explicitly not the father, with a cash transfer.

As we mention above, we start from the analysis of household level consumption patterns, but will focus particularly on how children's consumption is affected by specific interventions. This is because current consumption choices may crucially affect the ability of children to accumulate human capital via limited
expenditure on schooling or insufficient nutrition levels. In the long term, this deficiency in human capital may contribute to the intergenerational transmission of poverty.

As a result of limited access to credit, households under extreme poverty face difficult intrahousehold choices. They might need to constrain the resources available to non-productive members of the household (children) in order to guarantee adequate productivity of productive members. This can take the form of insufficient food intake for children, restricted access to education or child labour. All three of these effects are known to be common in poor societies. For example, according to Onis et al. (2000), about one third of children under the age of five in developing countries are stunted in growth. Inadequate nutrition in childhood affects long term physical development (Martorell and Habicht, 1986, Barker, 1990), as well as the development of cognitive skills (Brown and Pollitt, 1996 and Balazs et al 1986) and educational attainment (Behrman, 1996, Strauss and Thomas 1995). This in turn affects productivity later in life (Dasgupta 1993, Strauss and Thomas 1998, and Schultz 1999).

The remainder of this proposal gives full details about the main aims of the proposed research. Before that, however, we describe the data we plan to use.

2. The Data

In partnership with a research institute in Colombia (Econometria Ltd.) and a firm specializing in the collection of the data in rural Colombia (SEI), EDePo successfully won a bid for the evaluation of *Familias en Acción*, a program implemented by the Colombian government to foster human capital accumulation by poor families living in rural municipalities in Colombia. The program started in 2001 and is being sponsored by the World Bank and the Inter American Development Bank (IADB) through a loan to the Colombian Government. The program provides monetary transfers to mothers in beneficiary families, conditional on having completed some requirements: (a) children under seven should be taken to growth and development check-ups, (b) children between 7 and 17 years old should regularly attend school.

The evaluation of *Familias en Acción* will be based on the analysis of a database covering a representative sample of rural towns. We completed the collection of the baseline survey, which is analyzed extensively in our Baseline Report (EDePo (2003)) and which will constitute the basis of the research described in this proposal, between July and November 2002. Two follow ups of the baseline survey are planned for July-November 2003 and July-November 2004.

Our baseline survey includes interviews of about 11,500 households in 122 municipalities of rural Colombia. It is the first survey of this size on this very poor population: average household income and consumption do not exceed, in our sample, 150US$ per month, with an average household size of 7. We have designed, together with our Colombian partners, all the questionnaires and have managed to collect high quality data. We have collected information on household structure, household consumption, expenditure, income, health indicators and educational attendance. Income data includes labour income, income from small enterprise activities, savings as well as both institutional and non-institutional transfers. Household consumption data includes information on 96 different types of food, tobacco and alcohol consumption, transport services, personal care, household cleaning products, entertainment, clothes for adults, clothes for children, health related expenses, house furniture and gambles. We collect data not only on expenses but also on consumption of goods that were not bought in the market but come from in-house production or
in the form of gifts. In-kind consumption is valued at market prices, which are collected at the village level.\footnote{In addition to detailed village level prices, we also collect a variety of other village level information, in particular data relating to education and health infrastructure.} The ability to measure consumption in kind is particularly important in these societies, where most households are involved in some type of agricultural activity. Not surprisingly, around 60% of household report to have some non-market related consumption. For the average household in our survey, consumption in kind accounts for about 25% of the value of food consumption (see EDePo, 2003).

Notice that from the household consumption data on food, we cannot disentangle adult consumption from child consumption. However, we have information on children individual food intakes for the week preceding the interview. This data is particularly useful as it will allow us to study how prices and income influence food consumption by children in the household.

The evaluation of \textit{Familias en Accion} covers the collection of the survey and its analysis to establish the effect of the program on nutrition, health and education, as measured by a number of specific indicators. It does not cover the costs of research in general, and of course, does not cover the costs of the research we are proposing in this project. Having designed the survey, our research team is extremely familiar with the data.

3. Object of Study

In this research, we will study consumption choices of households in extreme poverty. The overall research proposal is made of three components: (i) the study of Engel curves of detailed consumption items, (ii) the study of the consumption of specific food items and their impact on nutrition especially for young children, and (iii) the development of new ways of moving from data on household consumption to the study of individual consumption patterns. We discuss these three themes in turn, although there are obvious complementarities among them.

3.1 The analysis of Engel Curves

An Engel curve for a given commodity describes how the share of that commodity in total consumption changes with the value of total consumption. Engel curves represent the basic tool in consumption analysis. In developing countries, and especially among the poorest households, a large share of total consumption is dedicated to food, while richer households tend to dedicate much smaller shares to food. What is much less well known is how food (and other commodities) shares move with marginal changes in total expenditure among households in extreme poverty.

Our data contains information on 96 different food items and about 30 other consumption items. As a first step, we plan to aggregate this wealth of information into roughly 10 categories, one of will be food. Food, which for our households represents on average over 60% of total consumption, can be further disaggregated into food groups related to nutritional content. We will start our analysis by fitting semi-parametric Engel curves to our data for various commodities. Engel curves can be used to predict how household consumption of food (and various food components) will change if total expenditure increases. This is particularly relevant for the analysis of government interventions that take the form of cash transfers, such as those currently implemented in Colombia, Honduras, Mexico, and Brazil.

In the baseline report for the evaluation of \textit{Familias en Accion} (EDePO, 2003), we estimated very simple least squares regressions of food consumption on a flexible function of total consumption. A surprising finding...
emerged in this simple analysis: the share of total food consumption increased with total consumption at low levels of total consumption, and decreased at higher levels. This quadratic relationship in food shares is not found in developed countries but has been observed in some developing countries (see for instance the evidence on Pakistan and South Africa in Deaton and Paxson (1998), as well as Girma and Kedir (2002) for Ethiopia). Confirming the existence of such a relationship and understanding why it is observed is extremely important for welfare analysis and policy evaluation. A hypothesis we will be investigating is whether non-monotonic Engel curves could be explained by differences in the income elasticities of individual food items.

In addition, we are also interested in the effect that (relative) prices have on the demand for specific goods. For this purpose, we will estimate flexible demand systems. We will identify price elasticities by exploiting the variation in market prices across villages. Knowledge of price effects is useful to predict how consumption of certain commodities changes if the government introduces a price subsidy.2

Price elasticities are key to evaluate both welfare and behaviour changes of tax and subsidy policies. Estimates of price elasticities for some developing countries already exist, with early references being Strauss (1982), Deaton (1987, 1988, 1990) and Jarque (1987). This literature usually faces the problem that price information is not collected and prices are “substituted” by unit values (household expenditure in a given good divided by the quantity bought). This introduces measurement error bias as Deaton (1987, 1988, 1990) and Kedir (2001) emphasize. Our dataset allows us to avoid these problems as it contains price information obtained from the market of each of the 122 villages. Lanjouw and Ravallion (1995), Subramanian and Deaton (1996), Deaton and Paxson (1998), and Girma and Kedir (2002) focus on the relation between food demand and expenditure but they do not estimate price elasticities nor do they consider women bargaining power. With respect to previous literature, therefore, our demand system will therefore combine a more rigorous estimation of price elasticities (based on prices rather than unit values), a flexible model for the relation between demand shares and expenditures, and allow for the effect of other variables, such as women bargaining power. As total consumption, consumption shares and women’ power are not independent decisions. For this reason, we will have to pay considerable attention to endogeneity issues in the empirical specification. We plan to use an instrumental variable approach and to use both village level variables and anthropometric measures as possible instruments.

We plan to use the methodology developed by Banks, Blundell and Lewbel (1997) to estimate flexible demand systems. Their methodology would allow us to compute price elasticities within a theoretically consistent framework, while at the same time allowing for complex patterns in the relationship between shares and total expenditure. We will also explore the possibility of using new quantile regression techniques that are able to deal with endogeneity.

3.2 The analysis of frequency of food intake by children aged 2-6

The survey we will use to conduct our analysis contains information on the number of days in the week preceding the interview that children aged two to six have consumed 19 different types of food. These variables, and the fact that we observe villages with and without cash transfers, are particularly interesting because they help us to identify the beneficiary of observed changes in overall consumption patterns. This is very important as many policies, including the particular intervention implemented in some of the villages,

2 For instance, through such a subsidy the government could be interested in increasing the consumption of milk, which is usually quite low in poor households.
are focused on improving children’s welfare rather than the welfare of the whole household. As we argued in the introduction, families constrained by credit might be forced to devote resources to productive household members instead of children. This sort of phenomenon, to the extent that it limits the accumulation of human capital, could reduce intergenerational mobility and create long run persistence in poverty. Consequently, it is particularly important to establish which are the most effective policy instruments (i.e. price subsidies, cash or in-kind transfers) to target children. The analysis of children’s food intakes can be extremely informative in this respect.

The nature of the data on frequency of food intake during the last seven days is quite particular. Only non-negative integers are valid answers to this question. Data with such structure is not rare in economics and there is an extensive literature studying the number of visits to the doctor, number of trips, number of takeover offers by firms and number of patents, among other phenomena associated with non-negative integer outcomes. Such data is analyzed using count data models (Cameron and Trivedi 2001). However, there is a feature of our particular question that makes its analysis more demanding. Since the maximum answer to the question is 7, the data is said to be truncated. Truncated count data models are particularly sensitive to distributional assumptions because the probability of taking a food for the full seven days enters in the expression for the mean. Consequently, standard robustness results for count data do not hold in this context (Gourieroux and Monfort 1984). In this context, the use of flexible count data models (Gurmu et al. 1999, Cameron and Johansson 1997) seems appropriate as they make fewer distributional assumptions than standard models. Our methodological innovation will consist of combining flexible count data models with the endogeneity of total consumption and women’s negotiation power within the household. Blundell and Powell (2002) successfully take into account the endogeneity of regressors in a flexible discrete choice model using a control function approach. This approach is especially adequate in non-invertible non-additive separable models such as count data and binary choice models because, in general, instrumental variables techniques fail to identify the parameters of interest. In addition, even in this context, we will explore the possibility of using quantile methods.

To our knowledge, this data structure is quite novel in the consumption literature. However, we are aware that nutritionists have used this type of data for their analysis of food intakes (Serdula et al. 2001), though they do not aim at explaining variations across individuals by socio-demographic characteristics. We believe that our methodological innovation can be useful for other disciplines as nutrition and public health.

3.3. Inferring Individual consumption from household consumption.

In addition to the direct analysis and implications of individual food intakes, information on individual consumption can be extremely useful for other purposes. In particular, we plan to use it to develop the methodologies proposed by Chesher (1997, 1998, 1999, 2000) to infer individual consumption information from household aggregates. Chesher’s idea is deceptively simple. If one observes the consumption of two households that differ only in family composition, the difference in consumption can be explained by the family members that are present in one household and not the other. By efficiently combining information on many different types of households one can in this way infer individual consumption from household aggregates. Two assumptions are crucial for this type of analysis. First, consumption has to be ‘private’ and ‘exclusive’ in the sense that it cannot contain public good elements. In other words, if something is consumed by one household member it cannot be consumed by another at the same time. Food is a good example of a commodity that satisfies this assumption. Second, and crucially, differences in household composition cannot have a direct effect on individual consumption. That is one has to exclude the possibility that the consumption of (say) a male of a certain age depends on the composition of the family to which he belongs. In other words, his consumption would be the same regardless of whether he
belonged to a family of 2 adults and 1 child or 1 adult and 2 children. This assumption is necessary to get around the lack of individual data. If one has some data on individual consumptions, albeit incomplete such as our intake data, one can test this assumption and, to a certain extent, estimate a richer model. In particular, we will be able to test (and relax) the hypothesis that the consumption of children aged two to six is independent of household composition. Obviously a rejection for this particular group would make estimates based on the same assumption for other age groups less believable. However, even in this case, we could try to model the relationship between frequency of intakes and actual consumption to get at individual quantities for children aged two to six. This is a group of particular interest, since it is the target of the nutrition intervention of Familias en Accion.

References


Dissemination strategy

We expect to publish our research output in high quality academic journals. We will also use the Edepo discussion paper series to disseminate our results. We will use IFS briefing notes to give a non technical account of our research to make our research output accessible to policy makers. We also plan to present our results in academic conferences and seminars attended by policy makers as well as academics. It is important to stress that Edepo is part of the Social Policy Monitoring Network that brings together academics and policy makers from Latin America and individuals from International Financial Institutions once or twice a year to discuss specific aspects of development policies. We plan to present the results from our research at meetings of the network. We also plan to present our research to the public health audience using our connections with the UCL department of Epidemiology.

Proposed timetable

We envisage starting the project in January 2004. Since we already have the dataset for our analysis in place and because we have designed and used it extensively in the baseline evaluation of Familias en Accion, we do not feel that we will need to invest any significant time or resources in data collection.

We shall produce three papers on the topics listed under Section 3 within the period of one year. Work on all these papers will occur simultaneously, with some preliminary results available for presentation by October 2004. After the analysis phase, we shall devote three months towards drafting and revising the three papers, with a view to final completion of the project in January 2005.