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# **Household Behavior in the Presence of Economic Crisis: Evidence from Argentina, 2002**

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## **Abstract**

At the end of 2001, Argentina suffered one of its worst economic crises in memory. When presented with lower incomes, reduced employment, and other economic shocks, households have responded by adjusting their consumer behavior by adopting a number of coping strategies. In this paper, we use evidence from a household survey completed at the time of the Argentine crisis to examine whether the use of coping strategies is directly linked to the type of shock experienced by the household and whether household behavior varies by wealth or family type.

## **1. Introduction**

Argentina is currently in the midst of a deep and unparalleled economic, social, and political crisis. After three years of continuing recession, the economic and financial crisis deepened during 2001. Various attempts were made throughout 2001 to spur growth as a prelude to improved public finances and the debt profile but to no avail. Market perceptions of risk of default increased, especially in mid-2001. Efforts to protect the banking system from wide-spread withdrawal of deposits resulted in strangling of liquidity and economic activity and generated popular discontent. This finally culminated in the resignation of then President de La Rúa, a quick succession of appointed Presidents, a formal announcement of default on public sector borrowings, and in early 2002, the abandonment of the Convertibility Plan.

Now in its fifth year of recession, the economy this year has declined by about 11 percent, bringing the decline in GDP to over 20 percent since its 1998 peak. With the peso depreciating sharply since its float and undefined monetary policy, Argentina is experiencing significant inflation for the first time since 1991. Between the decline in economic activity and the currency's depreciation, per capita GDP has declined sharply, to about US\$2,850 in 2002 (down from US\$8,210 at its peak in 1998).

The social impact of the crisis has been devastating. During the first half of 2002, the share of population considered poor grew by roughly 15 percentage points while the number of extreme poor nearly doubled. Currently, more than half of the population live below the poverty line, and close to one-fourth of the population is considered extreme poor or indigent. Between October 2001 and May 2002, household incomes fell in nominal terms by an average of 8 percent, or roughly one-third in real terms. About half of all households experienced some reduction in nominal incomes, a fact that applied to a substantial portion of the middle class. During the first half of 2002, unemployment increased by 3 percentage points to 21 percent, and formal sector employment fell by an additional 5 percentage points. There was also a deterioration in the quality of jobs and an increased reliance on secondary wage earners. Most new jobs were temporary and absent of standard benefits associated with formal sector employment.

This paper analyzes the various coping mechanisms and strategies adopted by Argentine families during these hard times and extends a more detailed analysis of the welfare effects of the economic crisis included in Fiszbein et al. (2002).

## **2. Data**

This paper uses data from a nationally representative household survey<sup>1</sup> specially conducted to assess the effects of the economic crisis on households' welfare and identify the coping mechanisms and strategies adopted by Argentine families during these hard times.

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<sup>1</sup> The survey was conducted by IBOPE, covering 2,800 households. The field work was done during the months of June and July of 2002.

The first part of the questionnaire asked for information on all household members and included questions on demographic characteristics, employment, income, migration status, education level and health coverage. The second part of the questionnaire focused on the household as a unit inquiring about the use of savings, changes in consumption patterns, and participation in social programs and community activities. The questions were answered by the head of household (or the best informed individual in the household).<sup>2</sup>

## **2.1 Household-specific identifying factors**

We are interested in identifying factors that influence household decisions to engage in various coping strategies. We focus on how two particular economic shocks – income loss and employment loss– can be linked to the likelihood of households adopting particular coping strategies. We also examine how family type, household structure, and household characteristics affect these decisions.

*Household incomes.* In the survey, monthly reported average income per-capita from all sources amounted to \$214 or the equivalent of approximately US\$60. The survey team also asked each individual whether its current income had changed in nominal terms relative to October 2001. Almost 40% of the households reported a reduction in nominal incomes, while about 8% of the households reported increases in incomes.

*Employment.* While the survey suggests that the overall activity rate was roughly constant between October 2001 and the time of the survey, there were significant changes in labor market status for specific households. (For more details see: Fiszbein et. al, 2002.) For the purposes of this study, we will use an indicator for whether a member of the household became unemployed during the period in question. In the survey approximately 5.5% of households suffered a loss of employment by at least one member.

*Household Structure.* In socioeconomic studies, it is widely accepted that certain behaviors differ based on household structure. In our case, we use the typology proposed by Torrado (1998) for the case of Argentina. The “two-parent nuclear household” represents 54% of the household within the survey. It is commonly believed that the crisis has led many traditional households to incorporate other members, such as married children, parents of the married couple, grandchildren, etc. as a means of taking advantage of economies of scale. Households with a head of household and spouse present that have non-nuclear members are referred to as “two-parent non-nuclear” households.<sup>3</sup> In the survey 14% of households are of this type. Finally, single-parent households (where the head of household has no spouse present) represent 8% . The remaining 24% of the households are non conjugal.

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<sup>2</sup> If the head of household did not know the answer to a particular question (e.g. changes in consumption patterns) the household was visited up to three times to find the household member that could respond the specific question.

<sup>3</sup> For parsimony, in the text we refer to two-parent non-nuclear households as simply “non-nuclear households.”

*Family Characteristics.* We are also interested in how the size of the household may affect economic behavior. We follow the guidelines of the Instituto Nacional de Estadísticas y Censos de Argentina (INDEC)<sup>4</sup> in establishing a comparable index of family size. These guidelines suggest weighting family members by their age and gender to create an “adult equivalent index.” Details of this construction are available upon request.

Additionally, we consider other characteristics of the household such as the number of children. The average number of children for those households with children, is 1.9. We also considered the age and the education levels of the head of household, measured as the number of years of education completed.

*Wealth.* Following Filmer and Pritchett (1994) we created a wealth index based on 29 asset ownership characteristics using factor analysis. For the empirical analysis we compare the behavior of households in the lowest third of the wealth distribution with that of households in the highest third of the distribution. This way, we are fairly confident that we are measuring differences between the “poorest” and the “wealthiest” households.

## 2.2 Coping Strategies

There is a growing empirical literature that examines household reactions to economic shocks in Latin America. Recent papers include Neri and Thomas (2000) looking at employment shocks in Brazil; Cunningham and Maloney (2000) looking at the case of Mexico and Gaviria (2001) studying seven Latin American countries, including Colombia, Ecuador, Guatemala, Honduras, Nicaragua, Paraguay, and Venezuela. Unlike those papers which use longitudinal data, we use cross-sectional, retrospective data for the same purpose.

The survey inquired about the strategies most frequently used by households in reaction to the worsening economic conditions experienced over the previous eight months.<sup>5</sup> In this section, we provide a general description of the several types of strategies employed by households. We have grouped them into three categories: *adaptive household strategies*; *active household strategies* and *social network strategies*<sup>6</sup>.

Adaptive household strategies are those where households responded to the crisis by changing consumption patterns including the use of various types of services. Active household strategies involve the incremental use of physical, financial and human assets available to the household, including adding new workers, working more hours, selling

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<sup>4</sup> See “Incidencia de la pobreza y la indigencia en los aglomerados urbanos (2001). Anexo Metodológico.

<sup>5</sup> A more detailed description of each coping strategy is given in the appendix.

<sup>6</sup> We present results on different coping strategies with the idea that each one is interesting in its own right. Furthermore, we expect that since each behavior will have a different income elasticity, it is likely that aggregating or combining groups will mask important differences in behaviors that may be of interest to particular readers. The risk is that some of the less common strategies will not have statistically significant relationships, but the analysis shows that this is not a problem.

assets, using savings, borrowing, and migration. Social network strategies, include strategies that rely on assistance from friends, family, NGOs or government.

*Adaptive household strategies.* Table 1 summarizes the prevalence of adaptive household strategies in the survey. The most striking feature of this table is that the overall economic crisis has affected the behavior of most households, even those that did not experience one of the economic shocks studied here. Most families have reacted to the economic crisis through a combination of consuming less and substituting for less expensive goods both for essential and non-essential items. In each case, households affected directly by economic shocks are more likely to participate in adaptive coping strategies. It is somewhat surprising that reduction of food consumption is reported by such a large percentage of households, especially households with more children (see Table 1). However, the data in this table reflects behavioral changes in the aggregate and do not parse out the income effect from the substitution effect. We note that during the crisis, relative prices were changing, and food became relatively more expensive.<sup>7</sup> In the more detailed analyses that follows, we isolate the effect of income losses from the substitution effect by looking specifically at whether income-related economic shocks are linked directly to these changes in behavior.

Another interesting observation from this table is that 37% of households did not buy the medicines that they needed. It is also noteworthy that households that were directly affected by the crisis show higher rates of reduced access to medical care (For more details see: Uribe and Schwab, 2002). A particularly troubling aspect of this strategy is that households with three or more children were the most likely to have employed this strategy.

While these results are striking, there are probably many confounding factors. For example, household type is almost certainly correlated with household income – households with more children are more likely to be low income. In the more detailed analyses that follows, we use controls to isolate the effect of family structure from income, wealth, and other variables.

*Active household strategies.* Table 2 summarizes the prevalence of changes in active household strategies in the survey. The use of these strategies in most cases is smaller than adaptive strategies. However, this may be somewhat deceiving. Looking at the relative prevalence before and after suggests that there were significant changes. For example, 2.8% of households report selling or pawning belongings at present, but only 0.6% report participating in this activity as of October, 2001 . (For more details see: Fiszbein et. al, 2002) . Hence, during the economic crisis this behavior has become about four times as often. Similar patterns hold for other active strategies.

Overall we see that households impacted by economic shocks are generally more likely to have employed active strategies. Although most active strategies are not particularly

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<sup>7</sup> The CPI increased by 30% during the first six months of the current year. The increase in the prices of food items was higher (39%) than average

common in the non-affected population (with the exception of home food production), the extent of these changes is not entirely unexpected.

With respect to family structure, we also observe an interesting phenomenon. Both “home food production” and “home production of goods for sale” have begun to be used more by larger households (more adult equivalent members). See Figure 1.

While it is the case that many of the active strategies are not particularly common among the unaffected population, the data shows some evidence that household-specific shocks are associated with higher utilization of active strategies. In particular, employment loss results in a dramatic increase in all active strategies when compared to households with no economic shocks. For example, among households that have savings, there is a dramatic difference in living off savings between those that faced no economic shocks (9%) and those that had a loss in employment (41%). The effects of other shocks are similar but less dramatic.

In the case of active strategies, it is almost certainly the case that household wealth will affect household behavior. In particular, we note that for households in the lowest third of wealth, beginning to sell or pawn belongings is twice as prevalent as for households in the highest third of wealth (4.0% vs. 2.1%), and beginning to live off savings is three times as likely (33.7% vs. 11.1%). Certainly allowing behavior to vary by household wealth will be an important consideration for active strategies.

*Social network strategies.* A third type of behavior under crisis that we will study is the prevalence of social networking strategies. Table 3 summarizes the prevalence of changes in these strategies in the survey. As expected, a significant number of households have begun to rely on social networking as a means of consumption. As was the case with adaptive and active strategies, households that have been affected directly by an economic shock are more likely to have employed social network strategies as a method of coping with the economic crisis.

It is likely that the structure of the household will affect the propensity of families to begin to utilize social network strategies. In table 3 we see that single parent households are more likely to have begun using social network strategies than other household types, except communal activities which are more prevalent among non-nuclear households.

### **3. The Econometric Model and Empirical Results**

In this section of the paper, we estimate the effects of the economic crisis on household behavior in a variety of settings. We analyze the effect of household-specific economic shocks on the probability of increased utilization of the coping strategies described in the previous section. We also examine the relationship of these behaviors to household type and wealth status.

#### **3.1 The Econometric Model**

Since all of the dependent variables of interest are binary in nature, the econometric model is a simple limited dependent variables model, where the various measures of economic shock affect the probability that a given household changes its consumer behavior in a particular way.<sup>8</sup> Let  $y$  represent any given binary outcome for the dependent variables of interest, and  $X$  represent the vector of measures of the impact of the economic crisis on the households in question. Then we presume that the conditional expectation of  $y$  varies with the properties of  $X$ :

$$E(y|X) = Prob(y=1|X) = F(X)$$

There are many options for estimating the effect of  $X$  on  $y$ . We have chosen to use logit regression, where  $F(X)$  is assumed to be the standard logistic function. In this case, one can also easily calculate marginal effects for a continuously valued explanatory variable,  $X_k$ :

$$P(y=1|X) / X_k = f(X)$$

where  $f(.) = F(.) / X$ . In the case of discrete explanatory variables, the reported “marginal” effect is actually its average effect:

$$Prob(y=1|X_k=1) - Prob(y=1|X_k=0) = F(X | X_k=1) - F(X | X_k=0)$$

Note that because of the nonlinearity of the logistic function, these are actually more complicated calculations than would seem. In particular, both the marginal and average effects in the logit framework depend on the values of the  $X$  variables.

In our case, the set of  $y$  variables examined includes all 17 of the coping strategies described in Section 2 and in the Annex.  $X$  contains a detailed set of economic shock variables along with important household-level control variables.

As indicated earlier, we wish to examine whether the effects income and employment shocks vary by household wealth. This is done using interaction terms.

### 3.2 The empirical results

In this section we present results from the logit models estimated for each coping strategy. We emphasize that all of the dependent variables are measured as *changes* in coping strategies, and not as levels of coping strategies. For example, one of the social network strategies deals with the reliance on friends or family for support. In constructing the measure of this variable, we use whether the household *began* to rely on

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<sup>8</sup> Ideally, one might wish to estimate a conditional logit model. However, this would require information on the participation in every strategy pre- and post, and presupposes that there would be sufficient numbers of households that had both increases and decreases in income. Given the data at hand this is not an option at present. Another concern has to do with endogeneity. After reviewing the nature of the economic crisis, we are confident that the explanatory variables of interest represent household reports of the impact of shocks stemming from the exogenous economic crisis. Nevertheless, in future work we plan to investigate possible mis-specification of these equations.

friends or family for support after the economic crisis. Thus the effect of the shocks is measured as a change in the probability that a household changed its behavior.

We first estimated a logit regression for each of the seventeen coping strategies with independent variables including household-specific economic shocks, household type and characteristics, and other controls. (Summary statistics for the independent variables of interest are presented in Table 4<sup>9</sup>.) Then we re-estimated these equations with interaction terms between wealth categories and the income and employment shock variables. In tables 5-6 we report results from the first set of regressions,<sup>10</sup> and tables 7-9 show the results that emerge from the expanded regressions. In each case, we report the estimated coefficients and odds-ratios from the logit estimations. The marginal effects at the mean of the variable are also reported, as well as the mean of the dependent variables.

In order to make this presentation clear, we have divided the results into three subsections. First, we report our finding on how household-specific economic shocks have affected coping strategy behavior. Secondly, we report findings on whether changes in utilization of coping strategies are related to family type. In particular, we are interested in how household characteristics, such as size, presence of children, family structure, female head of household, and the education of the head of household can be linked to differences in economic coping behaviors. Finally, we report findings on how economic behaviors depend on household wealth.<sup>11</sup>

### *Household Strategies and Economic Shocks*

While we recognize that the economic crisis has affected nearly everyone in some way or another, we are particularly interested in how households that are especially impacted have reacted to the economic crisis. In this section, we analyze the relationship between two household-specific economic shocks (income loss and employment loss) and how they are correlated with households' decisions to engage in various coping strategies. A related question is whether these shocks have had the same effect for the wealthy and the poor. Those results are reported in a later subsection.

**Income Shocks.** As expected, in every case the effect of a reduction in household income has a positive effect on the probability of adoption of coping strategies. Among the adaptive strategies, there is substantial evidence that households with income losses are more likely to have engaged in a broad set of coping strategies, including reduction in consumption of both essential and non-essential goods, as well as a shift towards less expensive forms of both essential and non-essential goods.

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<sup>9</sup> The regressions also include controls for urban location, family income, and indicators for whether the family was affected in any of several ways by the *corralito* banking policy.

<sup>10</sup> Caveat lector - the results are not presented in the usual format. The actual estimation involved 18 logit equation where the dependent variables are the coping strategies. Each equation includes the three economic shocks as well as a set of control variables listed in the appendix .

<sup>11</sup> Only specifically interesting coefficients and results are reported. The full set of regression results is available upon request.



The effects of an income shock on utilization of active strategies are generally observed to be smaller than for adaptive strategies, and fewer are statistically significant. One exception is the large effect on households beginning to sell or pawn belongings as seen in the odds ratios. We also note that these households were also more likely to have engaged in increased work effort (home production of goods for sale and working more hours) which is what traditional economics labor supply would predict. While looking at the marginal effects gives an idea of the size of the absolute effects, we should expect larger impacts at the margin for those activities that are less common in the population at large. A case in point is the impact of an income shock on the decision to engage in home production of goods for sale. While the marginal effect of the shock is only about 4%, this represents a significant impact on a strategy that is only used by 12% of the population. So, by comparison, the group that is affected by an income shock is much more likely to begin to engage in home production than those who were not affected.

Similarly, the effects for the social network strategies have relatively small marginal effects, but in a relative sense, households that suffered a loss in income are much more likely to begin to employ social network strategies. Specifically, the odds of supporting by friends and families is almost 90% greater, holding all variables constant.

**Employment Shocks.** Another set of solid results comes from our examination of the impact of one or more household members losing employment. These results are presented in Table 6. Similar to the income effect (and not surprisingly so), in most cases households with employment shocks were more likely to have engaged in coping strategies. While the effects on adaptive strategies are generally larger than those observed for the income shocks, these results are not as statistically significant. Taken as a whole, the results on adaptive strategies suggest again a diverse pattern of coping strategies for those with employment losses.

Another predicted effect of employment loss is that since the opportunity cost of time has fallen, there should be a significant and positive shift toward home production. The observed results support this hypothesis. Households with employment loss are more likely to engage in home production of both consumption goods and goods for sale. They are also more likely to be living off of savings which is also consistent with the usual life-cycle models of consumer behavior.

With respect to social network strategies, just as with the income shocks, employment shocks are associated with significant and large increases in the probability that households began to employ these coping strategies. The results show that it is particularly important in the case of participating on community activities, in which the odds is 2.78 times greater.

Finally, we point out that these employment-related results are in addition to any income effect that would arise if households that suffered employment loss also suffered income losses. The effects are cumulative, so a household that suffered both an employment loss and an income loss would be predicted to be 8% (4% income effect + 4% employment effect) more likely to increase reliance on friends and family than one who had neither of

these shocks. Considering these two effects conjointly suggests an even greater impact of the economic crisis than one would observe by considering them separately.

### *Household Structure and Characteristics*

In Tables 7 to 9 we present results on the impact of household structure or family type on some of the most interesting coping strategies. Household size, per se, does not appear to have a significant effect. Larger households are observed to be more likely to have substituted towards cheaper transportation, but, on the other hand, household size seems to have little (and non-significant) impact on the reduction in food consumption or medications.

However, the probability of reducing food consumption depends positively on the number of children in the household. In fact, for *each additional young child*, the odds of having reduced food consumption increase by 12%. Note that this result holds when all else remains equal, including income and wealth. We must recognize, though, that we cannot tell how food is distributed within the household and thus whether children indeed suffer disproportionately.

Additionally, there is a positive and highly significant effect produced by the variable *family type* on reduced purchases of medicines when needed. Specifically, for single parent households, or where the family nucleus is extended and there is no direct blood relationship among the members of the household, the probabilities of reducing consumption of medications that are in fact being needed, are higher than in the case of complete nuclear households. This is possibly linked to the lower probability of finding extended families in which all of its members have medical insurances, restraining in this way their access to medications.

As we observe in tables 7 to 9, the group of variables that characterize the *family structure* do not have a significant effect on the rest of the strategies. However, it is noteworthy to add that, as expected, the probability of having at least one member in the household that has migrated due to the crisis is significantly lower in complete nuclear households. This effect is higher in the case of extended households.

Households led by female heads have highly significant effects in beginning to use strategies related to home production, whether it is aimed at substituting manufactured goods or in order to sell their own production. In this last case, the probabilities are 77% higher than for households headed by men. A possible explanation of this difference is that this type of strategy is more accessible to women due to the fact that it involves work “in the house”. Households led by men often recur to other kinds of coping mechanisms. Holding all else equal, these households have higher probabilities of turning to their savings or of selling their assets. At the same time, these are households in which the probability of a reduction in consumption patterns is 64% less likely than in female led ones.

The *age of the head of household* does not appear to be an influential variable. However, there is a positive and significant relationship on beginning to sell or pawn belongings and bartering. This might be due to the fact that households with older heads have probably accumulated more physical assets over time and are therefore more prone to sell or pawn some of these.

Isolating all other effects, higher *years of education for the head of the household* affect negatively and significantly the strategy of reducing food and medicine consumption. This reflects a higher value assigned to these goods, (in many cases essential goods) seeking alternative strategies for survival such as increasing the number of hours worked.<sup>12</sup>

Finally, some interesting facts are observed in terms of the variables that appear to have effects on the likelihood of receiving assistance from the government. Single-parent households are more likely than traditional households to begin receiving public assistance. Also, the odds of receiving assistance are increased 35% for each additional equivalent adult in the household, holding the rest of the variables constant. The number of children present has a positive effect, although it is not significant, while the age of the head of household negatively affects the probability of receiving government assistance. These results are closely related to the distinctive characteristics of one of the main social program (*Plan Jefes y Jefas de Hogar*) provided by the government during this period of crisis. Lastly, we observe that for each additional year of education of the father, the probability of receiving assistance is 14% lower, and this effect is significant.

### *Coping Behaviors and Household Wealth*

An important question is whether the impact of household-specific shocks varies by socioeconomic status. To address this question, we have included cross-product terms with our constructed wealth index in the regression specification. In order to make interpretation easier, and because we are concerned about potential measurement errors, we divide the sample into thirds based on the wealth index. In the following comparisons, we look at the difference in the effect of income and employment shocks on coping strategies for those from the lowest third when compared to those from the highest third. These results are included with the household structure results in Tables 7-9.

First, we discuss differences in the effect of an income shock on coping strategies. Our results suggest that there are only limited differences in adaptive or active household coping behaviors between the wealthiest third and the poorest third. Two significant differences are that the effect of a loss in income is much less likely to have resulted in a reduction in food consumption or for beginning to sell or pawn belongings for the wealthiest third than for the poorest third. However, with respect to social network strategies, there are more important differences. Households in the highest third of the wealth distribution are observed to be more likely to rely on support of friends and family and less likely to have received public assistance or participate in communal activities. These results are consistent with the hypothesis that wealthier families also have greater

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<sup>12</sup> Table 8 shows positive coefficients for this strategy although these are not significant.

access to resources through family and friends, suggesting a smaller need for reduction in consumption or reliance on broader social strategies.

With respect to employment loss, a slightly different pattern is observed. Similarly than in the case of an income shock, when compared to the poorest third of households, those in the highest third of the wealth distribution that suffered an employment loss are less likely to sell or pawn belongings. On the contrary, the main difference is that while they are more likely to receive support from friends and family when they experience a shock of employment, they are less likely to use this strategy when they have an income shock. Their labor market behavior also differs from those in the lowest third. The richest third are less likely to have added a new worker to the labor market and they are more likely to increase work hours as a coping strategy. This may be due to the fact that they were more likely to have all adults working, thereby preventing an increase in labor force participation, and requiring an increase in work effort by those who are employed as the easiest margin of adjustment. In fact, the difference on the effect of working more hours is a substantial one, with an odds ratio of almost 5, suggesting that this behavior is five times more likely for those in the top third of wealth than for those in the bottom third.

## **7. Conclusions**

In this paper, we have looked at three main issues: (i) how specific economic shocks have affected household behaviors by focusing on the coping strategies adopted by Argentine families after the ‘post-convertibility’ economic crisis; (ii) how coping behaviors are influenced by standard household characteristics (e.g. size, composition, etc.); and (iii) how behaviors differ between richer and poorer households.

We have used data from a recent survey of Argentine households specially conducted to assess the effects of the economic crisis on household welfare. The analysis is unique in its ability to estimate the relative responses to welfare losses in several dimensions. Not only can we look at both income and employment losses, but we can also consider a variety of measures of household behavior. We have categorized 17 observed household behaviors into three broad categories – adaptive strategies, active strategies, and social network strategies.

Specifically, we find that a reduction in household income is associated with significantly higher rates of use of adaptive and social network strategies, especially reduction in consumption of elastically-demanded goods, but also a reduction in the consumption of food. Smaller impacts are observed for active strategies.

As expected, the effects on households of employment loss are generally larger than those of a generic income loss. In particular, strategies that are more attractive when time costs are lower (such as home production and slower modes of transportation) are more responsive to employment loss. There are also large and significant effects on active and social network strategies.

The analysis suggests that households with a larger number of children, single-parent households and female headed households are significantly more likely to reduce consumption and go without needed medicine<sup>13</sup>. Households with single parent are significantly more likely than traditional household to have gone without needed medication. Additionally, if the head of house is a female, it is more likely to reduce food than a male house-headed, but we are not able to identify intra-families negative effects.

Larger households and single parent household are more likely to receive public assistance, holding other things equal.

Our results suggest that there are only limited differences in adaptive or active household coping behavior between different wealth groups. Not surprisingly, we find that the probability that income losses will result in reduced food consumption or the sale of assets is positively correlated with wealth. Perhaps more notable is the significantly higher probability of increasing work effort (i.e hours) among the top wealth group in the sample.

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<sup>13</sup> We further analyze the issue of “children food security measure” in a forthcoming paper.

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## Annex –Detailed Descriptions of Coping Strategies

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<b>Adaptive Strategies</b>	
Reduced Food Consumption	Reduced the quantity of food consumed
Substitute to Cheaper Food	Substituted toward consumption of cheaper food
Reduced Non-Food	Reduced purchase of non-food goods
Substitute to Cheaper Non-Food Goods	Substituted toward purchase of cheaper non-food goods
Not Able to Buy Needed Medicine <sup>1</sup>	Household members were not able to buy needed medicine
Substitute to Cheaper transportation	Switched to cheaper transportation (from private car to public transportation or from public transportation to bicycle/walking)
<b>Active Strategies</b>	
Home Food Production	Increased home production of consumption goods
Home Production of Goods for Sale	Begin to make items at home for sale
Migrated	A member of the household has emigrated or permanently relocated to another city, province, or country except due to marriage, illness, or becoming independent.
Sell or Pawn Belongings <sup>2</sup>	Begin to sell, pawn, or mortgage belongings (clothing, foods, jewelry, animals, tools, etc.)
Live off Savings <sup>2</sup>	Begin to maintain home by drawing down savings
Adding new workers to labor market	At least one household member joined the labor force
Working more hours	At least one household member began to work more hours
<b>Social Network Strategies</b>	
Support by Friends/Family <sup>2</sup>	Begin to receive support from people outside the home
Received Public Assistance <sup>2</sup>	Begin to maintain home by “social help plans” (government, churches, not-for-profit institutions)
Bartering <sup>2</sup>	Begin to participate in some form of bartering
Communal Activities <sup>2</sup>	Begin to participate in any form of communal activity: school meal programs, neighborhood or communal meal programs, communal purchase, “American” fairs, communal workshops for income, neighborhood work groups, fund-raising, communal child-care, movements to increase government programs, or communal construction (walkways, schools, etc.)

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- Notes:** 1. Households were asked whether members were able to buy needed medicine from October 2001 to June-July 2002
2. For these activities, households were asked whether they participated or relied on them prior to October, 2001, and whether they participate or rely on them currently (June-July, 2002).

**Table 1. Adaptive strategies**

<i>Changes in consumption patterns</i> <sup>1</sup>	All Households	Income Loss	Employment Loss	No Shock
<b>Adaptive Strategies</b>				
<b>Food</b>				
Reduced Food Consumption	73.50%	76.70%	84.80%	68.20%
Substitute to Cheaper Food	92.60%	95.00%	97.40%	88.10%
<b>Other goods &amp; services</b>				
Reduced Non-Food	81.10%	84.00%	89.90%	77.40%
Substitute to Cheaper Non-Food Goods	82.80%	85.60%	90.00%	78.90%
Substitute to Cheaper Transportation	59.90%	64.20%	75.90%	51.50%
<b>Health services</b>				
Not Able to Buy Needed Medicine	37.30%	41.20%	48.40%	33.50%

<i>Changes in consumption patterns</i>	All Households	Without Children	1 Child Present	3+ Children
<b>Adaptive Strategies</b>				
<b>Food</b>				
Reduced Food Consumption	73.50%	69.60%	74.00%	92.10%
Substitute to Cheaper Food	92.60%	91.20%	93.70%	96.50%
<b>Other goods &amp; services</b>				
Reduced Non-Food	81.10%	80.00%	80.80%	85.50%
Substitute to Cheaper Non-Food Goods	82.80%	81.10%	85.10%	88.50%
Substitute to Cheaper Transportation	59.90%	56.70%	61.90%	71.50%
<b>Health services</b>				
Not Able to Buy Needed Medicine	37.30%	35.20%	34.10%	56.30%

<sup>1</sup>Changes are calculated only for the subsample where the concept of change is meaningful.

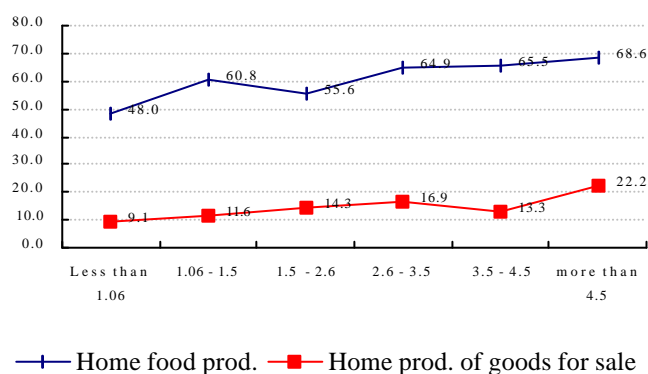


**Table 2: Use of active strategies**

<i>Changes in consumer behavior</i>	All Households	Income Loss	Employment Loss	No Shock
<b>Active Strategies</b>				
<b>Time utilization</b>				
Home Food Production	60.50%	63.30%	72.20%	55.20%
Home Production of Goods for Sale	14.70%	18.30%	23.40%	9.30%
Migrated	6.70%	7.20%	9.40%	6.10%
<b>Financial Behavior</b>				
Sell or Pawn Belongings	2.80%	4.50%	5.60%	0.80%
Live off Savings <sup>1</sup>	12.20%	14.40%	41.00%	9.20%
<b>Labor market</b>				
Adding new workers to labor market	13.40%	16.10%	11.80%	10.80%
Working more hours	14.80%	19.20%	10.50%	8.70%

<sup>1</sup>Only calculated for the sub-sample that report having savings.

**Figure 1. Home Production by Family Size**



**Table 3: Use of social network strategies  
By Household-Specific Economic Shock**

<i>Changes in social behavior</i>	All	Income	Employment	No Shock
	Households	Loss	Loss	
Support by Friends/Family	7.80%	10.60%	18.90%	5.00%
Received Public Assistance	4.30%	5.80%	7.70%	3.40%
Bartering	8.50%	11.70%	15.10%	4.40%
Communal Activities	6.30%	9.50%	16.10%	3.10%

**By Household Structure**

<i>Changes in social behavior</i>	All Types	Two-parent nuclear	Two-parent Non-nuclear	Other
	Support by Friends/Family	7.80%	7.60%	6.10%
Received Public Assistance	4.30%	4.30%	7.60%	1.50%
Bartering	8.50%	8.30%	12.00%	5.00%
Communal Activities	6.30%	6.60%	11.30%	3.40%

**Table 4: Summary statistics of explanatory variables of interest**

<b>Shock variables</b>	Obs	Mean	Std. Dev.	Min	Max
Income Loss	2763	0.409	0.492	0	1
Employment Loss	2763	0.091	0.287	0	1
<b>Household Type/Structure Variables</b>	Obs	Mean	Std. Dev.	Min	Max
Adult-Equivalent Family Size	2763	3.099	1.606	0.6	9.6
# of Children	2763	0.832	1.186	0	7
Single-Parent	2763	0.083	0.276	0	1
Two-parent, non-nuclear	2763	0.136	0.343	0	1
Two-parent, nuclear (Traditional)	2763	0.539	0.498	0	1
Other household type	2763	0.241	0.428	0	1
Female Head of Household	2763	0.283	0.451	0	1
Age (Head of Household)	2762	50	16	16	98
Education Level (Head of Household)	2725	9.402	4.267	0	17
Wealth Index	2749	0.000	2.283	-9.9	4.4

**Table 5. Income Effects**

	Income Shock		Marginal	
	Coefficient	Odds Ratio	Effect	Mean of y
<b>Adaptive Strategies</b>				
Reduced Food Consumption	0.334***	1.396	0.058	0.771
Substitute to Cheaper Food	0.426**	1.530	0.019	0.950
Reduced Non-Food	0.247**	1.280	0.035	0.829
Substitute to Cheaper Non-Food Goods	0.266**	1.305	0.035	0.841
Substitute to Cheaper Transportation	0.267***	1.307	0.062	0.616
Not Able to Buy Needed Medicine	0.323***	1.381	0.073	0.350
<b>Active Strategies</b>				
Home Food Production	0.093	1.097	0.022	0.617
Home Production of Goods for Sale	0.342***	1.407	0.038	0.124
Migrated	0.125	1.133	0.007	0.055
Sell or Pawn Belongings	0.977***	2.656	0.014	0.013
Live off Savings	0.152	1.164	0.002	0.012
Adding new workers to labor market	0.221*	1.247	0.019	0.091
Working more hours	0.380***	1.463	0.034	0.096
<b>Social Network Strategies</b>				
Support by Friends/Family	0.639***	1.890	0.039	0.062
Received Public Assistance	0.446**	1.561	0.006	0.013
Bartering	0.466***	1.593	0.023	0.051
Communal Activities	0.619***	1.857	0.026	0.041

\*\*\* Signif. 1%

\*\*\* Signif. 1%

\* Signif. 10%

**Table 6. Employment Effects**

	Lost Employment		Marginal	Mean of y
	Coefficient	Odds Ratio	Effect	
<b>Adaptive Strategies</b>				
Reduced Food Consumption	0.284	1.328	0.047	0.771
Substitute to Cheaper Food	0.737 *	2.090	0.026	0.950
Reduced Non-Food	0.452	1.570	0.057	0.829
Substitute to Cheaper Non-Food Goods	0.401 *	1.494	0.095	0.841
Substitute to Cheaper Transportation	0.596 ***	1.816	0.130	0.616
Not Able to Buy Needed Medicine	0.125	1.330	0.028	0.350
<b>Active Strategies</b>				
Home Food Production	0.316 **	1.371	0.072	0.617
Home Production of Goods for Sale	0.651 ***	1.916	0.086	0.124
Migrated	0.074	1.076	0.004	0.055
Sell or Pawn Belongings	0.396	1.486	0.006	0.013
Live off Savings	1.233 ***	3.430	0.025	0.012
Adding new workers to labor market	-1.041 ***	0.359	-0.062	0.091
Working more hours	0.210	1.234	0.019	0.096
<b>Social Network Strategies</b>				
Support by Friends/Family	0.566 ***	1.761	0.040	0.062
Received Public Assistance	0.265 **	1.303	0.004	0.013
Bartering	0.559 **	1.748	0.033	0.051
<b>Communal Activities</b>				
	1.025 ***	2.788	0.060	0.041

\*\*\* Signif. 1%

\*\* Signif. 5%

\* Signif. 10%

**Table 7. Adaptive Strategies and Household Structure/Characteristics**

	Reduced Food Cons.			Subst. to Cheaper Trans.			Reduce Medicine		
	Coef.	O R	Mg. Eff.	Coef.	O R	Mg. Eff.	Coef.	O R	Mg. Eff.
Household Size (Adult Equivalent)	0.03	1.03	0.005	0.18***	1.20	0.043	-0.02	0.98	-0.004
# of Children Present	0.12*	1.12	0.021	-0.08	0.93	-0.018	0.12**	1.13	0.027
Single Parent (1)	0.31	1.37	0.052	0.22	1.25	0.051	0.53***	1.70	0.127
Two-parent Non-nuclear	0.13	1.14	0.023	-0.24	0.78	-0.059	0.58***	1.78	0.137
Other household type	-0.16	0.85	-0.029	0.34**	1.40	0.078	0.29**	1.34	0.068
Female Head of House	0.49***	1.64	0.083	0.16	1.18	0.038	-0.05	0.95	-0.012
Head of House: Age	-0.01	0.99	-0.002	-0.03*	0.97	-0.007	0.01	1.01	0.003
Head of House: Age2	0.00	1.00	0.000	0.00	1.00	0.000	0.00	1.00	0.000
Head of House: Education	-0.04***	0.97	-0.006	-0.06***	0.94	-0.014	-0.07***	0.93	-0.016
Income Shock X Middle Third of Wealth	-0.49**	0.61	-0.049						
Income Shock X Upper Third of Wealth	-0.72***	0.49	0.020						
Employment Shock X Middle Third of Wealth	-0.55	0.58	0.162						
Employment Shock X Upper Third of Wealth	-0.40	0.67	0.005						
Mean of y	0.768			0.613			0.350		
Number of observations	2705			2097			2418		

1 The reference household has the following characteristics: Two-parent nuclear household with a male head of house of average education and age with no economic shocks.

\*\*\* Significance at 1%

\*\* Significance at 5%

\* Significance at 10%

**Table 8: Active Strategies and Household Structure/Characteristics**

	Home Production Food			Home Prod. Of goods for sale			Migrated					
	Coef.	O R	Mg. Eff.	Coef.	O R	Mg. Eff.	Coef.	O R	Mg. Eff.	Coef.	O R	Mg. Eff.
Household Size (Adult Equivalent)	0.05	1.05	0.011	0.04	1.04	0.005	0.15**	1.16	0.007			
# of Children Present	0.11**	1.12	0.027	0.12*	1.13	0.013	-0.34***	0.71	-0.017			
Single Parent (1)	-0.46**	0.63	-0.111	0.06	1.07	0.007	1.16***	3.20	0.091			
Complete Non-nuclear	-0.13	0.88	-0.032	0.10	1.11	0.012	0.73***	2.07	0.047			
Non-conjugal	-0.29**	0.75	-0.070	0.07	1.07	0.007	0.54**	1.72	0.030			
Female Head of House	0.31***	1.36	0.072	0.57***	1.77	0.068	-0.36	0.70	-0.017			
Head of House: Age	0.00	1.00	-0.001	0.02	1.02	0.002	0.10***	1.11	0.005			
Head of House: Age2	0.00	1.00	-5.22e-	0.00	1.00	0.000	0.00***	1.00	0.000			
Head of House: Education	-0.03**	0.98	-0.006	-0.03	0.97	-0.003	-0.02	0.98	-0.001			
Income Shock X Middle Third of Wealth	-0.01	0.99	-0.003	-0.06	0.94	-0.007	-0.28	0.76	-0.013			
Income Shock X Upper Third of Wealth	-0.24	0.78	-0.058	-0.20	0.82	-0.021	0.19	1.21	0.010			
Employment Shock X Middle Third of Wealth	-0.94**	0.39	-0.231	0.58	1.78	0.077	0.69	2.00	0.046			
Employment Shock X Upper Third of Wealth	-0.99**	0.37	-0.242	0.67	1.95	0.091	-2.47**	0.08	-0.051			
Mean of Y	0.616			0.125			0.053					
Nr. of obs =	2693			2312			2724					
	<b>Sell or pawn belongings</b>			<b>Live off savings</b>			<b>Adding new worker to labor market</b>			<b>Working more hours</b>		
	Coef.	O R	Mg. Eff.	Coef.	O R	Mg. Eff.	Coef.	O R	Mg. Eff.	Coef.	O R	Mg. Eff.
Household Size (Adult Equivalent)	-0.25**	0.78	-0.003	0.01	1.01	0.000	0.46***	1.58	0.037	0.14**	1.15	0.012
# of Children Present	0.24*	1.28	0.003	-0.06	0.94	0.000	-0.41***	0.66	-0.034	-0.05	0.96	-0.004
Single Parent (1)	1.26**	3.53	0.027	1.55***	4.70	0.023	0.25	1.28	0.022	0.16	1.18	0.015
Complete Non-nuclear	0.16	1.17	0.002	-0.57	0.56	-0.003	0.60***	1.82	0.059	0.13	1.14	0.012
Non-conjugal	0.51	1.66	0.007	0.44	1.55	0.004	-0.45**	0.64	-0.034	-0.17	0.84	-0.015
Female Head of House	-0.78**	0.46	-0.008	-0.78**	0.46	-0.005	0.22	1.25	0.019	0.04	1.04	0.004
Head of House: Age	0.12*	1.13	0.001	-0.08	0.93	-0.001	0.02	1.02	0.002	0.06**	1.06	0.005
Head of House: Age2	0.00**	1.00	0.000	0.00	1.00	5.16e-	0.00	1.00	0.000	0.00**	1.00	0.000
Head of House: Education	0.00	1.00	0.000	0.01	1.01	0.000	-0.07***	0.93	-0.006	0.01	1.01	0.001
Income Shock X Middle Third of Wealth	-0.77*	0.46	-0.007	-0.62	0.54	-0.004	0.04	1.04	0.004	0.27	1.30	0.025
Income Shock X Upper Third of Wealth	-0.82*	0.44	-0.008	-0.64	0.53	-0.004	-0.10	0.90	-0.008	-0.08	0.93	-0.006
Employment Shock X Middle Third of Wealth	1.67**	5.32	0.047	18.18***	0.00	0.996	-1.06**	0.35	-0.059	0.63	1.89	0.070
Employment Shock X Upper Third of Wealth	-1.24	0.29	-0.009	18.92***	0.00	0.996	-1.89***	0.15	-0.079	1.59***	4.93	0.242
Mean of Y	0.012			0.007			0.090			0.097		
Nr. of obs =	2724			2724			2724			2724		

**Table 9: Social Network Strategies and Household Structure/Characteristics**

	Support by friends/family			Received Public Assistance			Battering			Communal Activities		
	Coef.	O R	Mg. Eff.	Coef.	O R	Mg. Eff.	Coef.	O R	Mg. Eff.	Coef.	O R	Mg. Eff.
Household Size (Adult Equivalent)	-0.04	0.96	-0.002	0.30***	1.35	0.004	-0.01	0.99	0.000	0.27***	1.30	0.010
# of Children Present	-0.10	0.90	-0.006	0.10	1.11	0.001	0.13	1.13	0.006	0.12	1.13	0.005
Single Parent (1)	0.09	1.09	0.005	0.73*	2.08	0.013	0.33	1.39	0.018	-0.13	0.87	-0.005
Two-parent Non-nuclear	-0.14	0.87	-0.008	0.06	1.06	0.000	0.42*	1.52	0.023	0.32	1.38	0.014
Other household type	0.11	1.12	0.006	-0.40	0.67	-0.005	-0.08	0.92	-0.004	-0.07	0.93	-0.003
Female Head of House	0.14	1.15	0.008	-0.43	0.65	-0.005	0.28	1.32	0.014	0.25	1.29	0.010
Head of House: Age	0.05**	1.06	0.003	-0.08*	0.92	-0.001	0.11***	1.12	0.005	0.03	1.04	0.001
Head of House: Age2	0.00**	1.00	0.000	0.00	1.00	4.60e-	0.00***	1.00	0.000	0.00	1.00	0.000
Head of House: Education	-0.02	0.98	-0.001	-0.15***	0.86	-0.002	-0.05**	0.95	-0.002	0.01	1.01	0.000
Income Shock X Middle Third of Wealth	-0.08	0.92	-0.004	-0.36	0.70	-0.004	-0.13	0.88	-0.006	-0.28	0.75	-0.010
Income Shock X Upper Third of Wealth	0.48*	1.61	0.031	-0.84*	0.43	-0.008	-0.02	0.98	-0.001	-0.68**	0.51	-0.022
Employment Shock X Middle Third of Wealth	-0.39	0.68	-0.019	0.14	1.15	0.002	-0.44	0.65	-0.018	0.65	1.92	0.034
Employment Shock X Upper Third of Wealth	-1.40***	0.25	-0.047	1.67***	5.33	0.049	-0.87	0.42	-0.030	0.36*	1.43	0.016
Mean of y	0.061			0.013			0.050			0.041		
Number of obs =	2724			2628			2724			2724		

(1) The reference household has the following characteristics: Two-parent nuclear household with a male head of house of average education and age with no economic shocks.