BUYING LESS, BUT SHOPPING MORE: CHANGES IN CONSUMPTION PATTERNS DURING A CRISIS*

David McKenzie
Stanford University

Ernesto Schargrodsky
Universidad Torcuato Di Tella

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Abstract

Market research data are utilized to examine the use of changes in shopping behavior and changes in the quality of goods purchased as methods of mitigating the effects of the 2002 Argentine financial crisis. Although the total quantity and real value of goods purchased fell during the crisis, consumers are found to be spending more days shopping. This increase in shopping frequency occurs through consumers purchasing lower-quality goods from a wider variety of shopping channels. This paper provides the first estimates of the magnitude of such effects during an economic crisis, and suggests that this increase in shopping frequency can be an important coping mechanism for households. Shopping more often is shown to enable households to seek out lower prices and locate substitutes, allowing a given level of expenditure to buy more goods.

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1. Introduction

Economic crises which affect many households simultaneously greatly reduce the set of risk-coping strategies available to households. As Lustig (2000) notes, covariate shocks mean that group-based informal insurance arrangements are ineffective, as the incomes of a household's risk-pooling partners also fall. Access to formal credit markets is often limited in developing countries, and lending generally falls further during financial crisis. Dercon (2002) observes that self-insurance is also less useful during an aggregate shock, as returns on assets often collapse along with incomes. In particular, rising inflation can erode the purchasing power of financial savings, while a common desire to sell can reduce the relative price of other assets. A general economic slowdown and rising unemployment can stymie the efforts of households to increase labor hours or send additional household members to the labor force. As a consequence, household consumption expenditure often falls by as much as income, and malnutrition may increase.[1]

Although households may not be able to prevent a fall in total expenditure, they do adjust the basket of goods purchased in order to reduce the fall in food expenditure. The expenditure share on food increases, with McKenzie (2003) suggesting that this represents not only an Engel's Law income effect, but also the use of semi-durable goods as a further smoothing mechanism. Nevertheless, despite this shift in consumption from clothing and other semi-durables towards food, expenditure on food may still fall in real terms during a crisis. For example, Thomas et al. (1999) find this to be the case during the Indonesian crisis, while McKenzie (2003) shows this pattern during the Mexican peso crisis. As well as substituting between food and other items, both papers find that consumers further reallocate across food products, devoting a larger share of food expenditure to basic staples during the crisis.

[1] See the overview by Skoufias (2003) and the accompanying special issue of *World Development* examining private and public responses to economic crises and natural disasters.

In addition to reallocating consumption shares to protect the level of food expenditure, households may also adjust to a shock by taking actions which affect how much food a given level of expenditure can buy. In particular, households may change the frequency of their purchases, the stores at which these purchases are made, and the quality of items purchased. Standard multi-purpose income and expenditure surveys generally provide little information on this aspect of consumer behavior, and as a consequence, the use of such mechanisms in response to crisis has been largely unstudied. In this paper, we use high frequency expenditure data obtained from LatinPanel, a market research firm, to study these actions in the context of consumer adjustment to the 2002 financial crisis in Argentina. Despite real expenditure falling during the crisis, we find significant increases in shopping frequency, with consumers shopping more days a week and at a wider variety of stores. Mean days spent shopping for food, cleaning and beauty products were 0.6 days per month higher in 2002 than in 2001, with this increase in shopping frequency occurring through consumers spending more time shopping for low-quality products at stores traditionally used more by the poor. Consumers are also found to have reduced the quality of products purchased, with the expenditure share on premium brand items falling five percentage points in 2002.

There are a variety of ways in which an economic crisis might impact on consumer behavior, and in the remainder of the paper we examine whether the observed change in shopping frequency represents an adjustment to falling income, or the result of changes in inflation, price dispersion, and liquidity during the crisis. Although these other factors play a role, we find evidence for an income effect on shopping frequency, whereby poorer consumers shop more often to buy a given quantity of products. In the face of widespread unemployment, increasing shopping frequency allows households to use non-market labor for search activity and is found to be among the most prevalent of adjustment mechanisms used by consumers during the crisis. Such search behavior is found to be associated with consumers paying lower prices for the same products, and shifting some of their expenditure from premium to priced brands. As a result, a given level of expenditure is able to purchase a larger quantity of goods. Our calculations suggest that in response to the fall in income experienced during the crisis, consumers

used this adjustment mechanism to save, on average, approximately two to three percent of the cost of their food, beauty, and cleaning product expenditure, thereby mitigating twenty to thirty percent of the fall in real expenditure in these products.

In related research, Aguiar and Hurst (2004) argue that the retirement consumption puzzle in the United States, which is that retirement is accompanied by a dramatic decline in expenditures, can be accounted for by the large rise in time spent on home food preparation and increased time spent shopping. They use cross-sectional data with a large number of demographic and health controls to look directly at changes in quantities of food consumed with retirement. We have much richer data on shopping behavior over time, and have individual price data, allowing us to provide direct evidence that an increase in shopping time brings benefits to consumers. Our finding that increased shopping helps consumers mitigate an aggregate income shock complements their finding that home production can help in smoothing anticipated events and lends support to their general conclusion that expenditure may be a misleading measure of consumption.

In addition to its importance as a crisis mitigation mechanism, the increase in shopping frequency could help to explain the puzzle of why inflation is surprisingly low after large devaluations (Obstfeld and Rogoff, 2000). Burstein, Eichenbaum, and Rebelo (2004) argue that the non-tradable component of distribution costs and the substitution from high-quality imports to low-quality local goods explain this low pass-through. Our results confirm the presence of quality substitution and add that the increase in shopping frequency may reduce the ability of sellers to translate cost increases into prices.

The remainder of this paper is structured as follows. Section 2 provides a general overview of the macroeconomic conditions prevailing in Argentina before and during the crisis. Section 3 discusses the LatinPanel data. Section 4 then details the consumer responses to the crisis in terms of changes in expenditure, in shopping behavior and in quality. Section 5 examines several explanations for these changes in consumer behavior. Section 6 calculates the gains from increased shopping frequency and Section 7 concludes.

2. A Macroeconomic Overview

After eleven years of the convertibility plan, under which a currency board had pegged the peso at unity to the U.S. dollar, the Argentine Congress voted to devalue the peso on January 6, 2002. This devaluation followed the failure of several stabilization attempts during 2001 that ended in political and economic upheaval in December of that year, when the government imposed a partial freeze on banking deposits. This was followed by looting, protests, the succession of five presidents within a fortnight, and the default of Argentina's sovereign debt.[2] The peso immediately depreciated to sell at 1.60-1.70 pesos/dollar, and continued to depreciate until reaching a low of 3.90 pesos to the dollar on June 25, 2002. The peso appreciated somewhat over the last months of 2002, ending the year at 3.37 pesos per dollar.[3] Figure 1a shows the evolution of the monthly period average exchange-rate from the start of 2000 through to the end of 2003.[4] The peso is seen to have depreciated through the first six months of 2002, remained fairly stable between July and October 2002, and appreciated slightly in November and December of 2002. The year 2003 saw some further recovery, with the average exchange-rate for December 2003 being 2.92 pesos per dollar.

Argentina's real GDP fell 10.9 percent in 2002, the largest fall since records began in 1900.[5] This aggregate decline followed on top of three years of recession. Table 1 details the evolution of key macroeconomic variables from 1999-2003. Real private consumption is seen to have fallen by 14.4 percent in 2002, while the percentage of households in poverty increased from 24 percent in May 2001 to 38 percent in May 2002. While the earlier years of recession had been accompanied by deflation, the devaluation resulted in Argentina's first significant inflation since the end of the hyperinflation in

[2] See EIU (2002) for an excellent account of the events taking place during this period. Debate exists over how much of the causes of this crisis can be attributed to domestic sources, such as excess government spending and a lack of structural reforms, how much was due to real exchange overvaluation and financial dollarization under the convertibility system itself, and how much was a result of an unfortunate sequence of external shocks, including interest rate hikes by the U.S. Federal Reserve in the mid-1990s, the Russian crisis, and the collapse of the Brazilian real. See, for example, Weisbrot and Baker (2002), Mussa (2002), Feldstein (2002), Calvo, Izquierdo and Talvi (2002), De la Torre, Levy Yeyati and Schmukler (2003), Galiani, Heymann and Tommasi (2003), and Hausmann and Velasco (2003), inter alia.

[3] Exchange rates are sell prices reported by Banco de la Nación Argentina at http://www.bna.com.ar.

[4] Monthly average exchange rates taken from the IMF, *International Financial Statistics* Online.

[5] See "Argentine economy hit 100-year trough in 2002", Reuters, March 19, 2003.

1991. McKenzie (2004) details evidence from forecasts that this inflation was not expected, with most forecasts in November 2001 or earlier predicting that 2002 would be another year of deflation with zero growth or a small contraction. For example, LatinFocus (2002) reports that a consensus private sector forecast of growth for 2002, obtained from banks and consulting agencies, fell from -0.2% in December 2001 to -5.3% in January 2002. It appears that much of the inflation was unanticipated, while any attempt to offset a possible devaluation by holding dollar deposits was stymied by a forced conversion of dollar deposits into pesos. Although the failure of a last IMF-supported program in the third quarter of 2001 led experts to question the sustainability of the convertibility plan, the crisis still took the general population by surprise. Halac and Schmukler (2003) provide evidence that large and foreign depositors managed to withdraw much of their deposits in the run-up to the crisis, whereas holders of small deposits did not. Dollar deposits in accounts of up to $5,000 increased 16.9 percent between December 2000 and November 2001, whereas deposits dropped 6 percent in accounts of $20,000-100,000 and dropped 23 percent in accounts of 500,000 and above over the same period.

Nominal wage income adjusted slowly in 2002, and household real income fell as a consequence of sticky nominal wages accompanied by inflation, as well as due to increased unemployment. McKenzie (2004) finds that the shock to income in 2002 was experienced by most households and workers, with 63 percent of households suffering a fall in real income (using the CPI inflation) of 20 percent or more between October 2001 and October 2002. Using the Argentine labor force survey (EPH) for households with the same characteristics as those in the LatinPanel surveys, we calculate that mean household real income fell 32.4 percent between October 2001 and October 2002, again using the CPI to deflate incomes.

2.1. Inflation and Price Dispersion

Table 1 reports several measures of inflation for different products over the 1999-2003 period. The official Consumer Price Index is measured only for Greater Buenos Aires, and showed a 41 percent rise in consumer prices in 2002. Food prices rose more,

particularly for foods consumed by the poor, so that the price of the goods in the basic food basket used for calculating the indigence line rose 74.9 percent.[6] Wholesale prices of imported products rose 204.5 percent, in line with the cumulative depreciation of the exchange-rate at year-end. Burstein, Eichenbaum and Rebelo (2003) conducted a survey of product origin in several Buenos Aires supermarkets. Combining this with inflation rate data at the product level, they find a correlation of 0.69 between the rate of inflation in a product category and the market share of imported and exportable products in that category. A large amount of the relative price changes can therefore be attributed to differences in the tradability of different products. This is seen further in Table 1, where largely non-traded categories such as education, housing, and transport show the lowest price increases. While some of this reflects government control of prices, Burstein, Eichenbaum and Rebelo (2003) find that privately-provided non-tradeables also had a low rate of inflation.

Figure 1b plots monthly inflation rates from January 2000 through to December 2003. The official Consumer Price Index (CPI), Food Price Index and Wholesale Price Index (WPI) inflation rates are provided along with a fixed-basket food inflation rate constructed from the LatinPanel data to be used in this study. The basket of goods used to construct the LatinPanel index and the weights differ from the official index (see the next section for details). All four indices show relatively stable monthly inflation rates prior to 2002, with slightly negative rates on average resulting in deflation. Figure 1b then shows a definite break in the inflation series, with substantial variability in monthly inflation rates over 2002. Inflation took off at the beginning of 2002. All four series show that monthly inflation rates peaked in April, whereas the rate of depreciation of the peso was highest in January and February. April food inflation was 13.2 percent using the official food price index, and 12.7 percent measured by our LatinPanel index. Food inflation then averaged 4-5 percent a month between May and August, and was one percent a month or less from October through December 2002. Total annual food inflation was only 4.7 percent for 2003.

[6] Basic food price inflation from INDEC "Variaciones de Precios según la estructura de consumo por quintil de ingresos y evolución de la canasta básica de alimentos", 31 January 2003 Press Release, http://www.indec.mecon.ar.

To measure price dispersion, we use a weighted coefficient of variation in prices for all products in our LatinPanel dataset. A coefficient of variation for each product-quality combination (e.g. premium quality milk) is first calculated period-by-period (after trimming the top and bottom 1 percent of observations to control for outliers). To aggregate these up, we then weight by the share of mean expenditure allocated to that good, to allow for consumers to react more to price dispersion in products which comprise a larger share of their budget. Figure 1c shows that price dispersion increased substantially following the devaluation, and then fell again by the middle of 2002. The timing is closely linked to the rate of depreciation. This timing could occur if sticker prices are costly to adjust as in Diamond (1993). A depreciation will increase the price of replacement products, leading to increased price dispersion as stores adjust prices at different times. Moreover, after the exchange rate stabilized in the second half of 2002, the disappearance of some imported high-quality items should induce a smaller level of price dispersion than before the devaluation.

2.2. The *Corralito*

After an accelerating loss in banking deposits in the second half of 2001, the government imposed a partial freeze on deposits on December 3, 2001, in order to stop the bank run. Cash withdrawals were restricted to 250 pesos (dollars) per week. The freeze was dubbed the *corralito* (little fence) as deposits could be freely used inside the banking system but could not leave it. Thus, money within the financial system could be used to buy items from stores that accepted checks, credit cards or debit cards, to pay taxes, and to pay wages, services and mortgages in the formal economy. However, depositors were not able to use their funds for cash transactions, such as payment of informal employees, purchases at small stores, payment of cash transactions (such as public transportation and taxis), or to buy US dollars.

As these two monetary systems (inside and outside the *corralito*) co-existed, a market quickly developed for exchanging money from one to the other at a discount. Figure 1d shows the evolution of the tri-monthly average discount for these transactions from the

main domestic Buenos Aires stock exchange house. The daily average discount reached as high as 21% on March 26, 2002, when depositors would sacrifice a check for $100 in order to receive $79 in cash. In our analysis, this discount will proxy for the stringency of liquidity constraints. The withdrawal limits were gradually increased allowing the *corralito* to become progressively less binding until all restrictions were finally lifted on December 2, 2002.

3. LatinPanel Data

Our consumption data cover the period 2000-02 and are propietary of the marketing company LatinPanel, a subsidiary of TNS Gallup. LatinPanel follows the consumption decisions of a panel of 3000 Argentine households. 1500 of these households live in the Buenos Aires metropolitan area and the other half in the rest of the country (excluding Patagonia). In each area, the families are selected through stratified randomization (according to the 1991 Census socio-economic characteristics of the whole population). The families that participate in the sample report regularly all their purchase decisions for a sample of products. All the communication costs are paid by LatinPanel. Moreover, as a gratitude for their participation, households receive durable good prizes from LatinPanel through a "mileage" loyalty program.

Each partipating household is classified according to five demographic characteristics: location (Buenos Aires metropolitan area or the interior region of Argentina); socioeconomic level (ABC1-high income households, C2C3-middle income households, D1-upper-low income households, and D2E -low income households),[7] household size (1 or 2 members, 3 members, 4 members, and five or more members); housewife's age (less than 35 years old, 35-49 years old, 50-64 years old, and more than 65 years old);[8] and age of the youngest child (less than 6 years old, 6-12 years old, 13-18 years old, 19-25 years old, and without children or older than 25 years old).

[7] Appendix 1 explains the classification of households by income level.

[8] The housewife is the female household head or female spouse of the household head. If there is no housewife in the household, the age of the household head is considered. Maids are not considered members of the households, but the purchases they do for the household are registered.

The households in the sample are randomly replaced when they interrupt participation, do not provide the information correctly and on time, or reach 4 years of participation in the sample. The sample rotation rates have remained very stable during the period of analysis: 27.6% of the sample was rotated during 2000, 25.8% during 2001, and 28.3% during 2002. The relative importance of each of these three reasons for replacement have also been stable.[9] New families that decline the invitation to be included in the sample are also randomly replaced with households of similar characteristics.[10]

Due to confidentiallity restrictions, LatinPanel does not provide the consumption data at the household level, but at the pseudo-household level. Each pseudo includes all the households that share the same demographic characteristics. Thus, there are in principle 640 pseudos (2 regions × 4 socio-economic levels × 4 household sizes × 4 housewife's age categories × 5 youngest child's age categories). However, several pseudo-households are empty because no families satisfy all the characteristics. The final sample is then an unbalanced panel that includes between 360 and 400 pseudo-households at any point in time. The data also indicate the total number of families included in each pseudo. The mean number of households within a pseudo is 8, with the range being between 1 and 62. We weight each pseudo by the number of households within the pseudo in our calculations.[11]

The households report all the purchases of thirty-seven products by filling daily a "purchase diary" and sending it periodically to LatinPanel. The articles include food products (cooking oil, cocoa powder, coffee, yerba mate & tea, dressings sauce, biscuits, breakfast cereals, pasta & noodles, soups, canned food, milks, carbonated drinks, bottled

[9] The rotation rate is slighty higher for the households in the top socioeconomic levels. Moreover, for this group it is more likely that they voluntarily interrupt participation and less likely that they are discontinued for incorrect provision of the information. However, this applies equally before and after the devaluation, so that the composition of our sample does not change in a non-random fashion during the crisis.

[10] LatinPanel reports an acceptance rate above 50% for new invitations during the period of analysis, which is lower for the households in the higher socioeconomic levels. The acceptance rate shows minor decreases over time for all socioeconomic levels, which LatinPanel attributes to the growing reluctance in the population to receive strangers at home at a time of large increases in property crimes throughout the country.

[11] Households are surveyed at the end of each year to register changes in their characteristics. When a household reports a change, it is moved to its new pseudo as of December 31.

water, beers, fruit juice, frozen food, ice creams, yogurt, butter, and margarine); cleaning products (dishwashing detergent, bleach, home cleaners, floor waxes, air care products, kitchen rolls, napkins, toilet paper, laundry soap, and fabric softeners); and personal cleaning and beauty articles (toilet soap, deodorants, toothpaste, shampoo, hair conditioners, hair coloring, and feminine protection). Fresh food products (fruit, vegetables, meat, and bread) are not included as these items are largely non-branded, i.e. LatinPanel would have no corporate clients to sell these data to. Meals out are also excluded. In terms of total LatinPanel consumption, the mean share of food expenditure is 76 percent, with cleaning products averaging 13 percent and beauty products 11 percent of total expenditure.

For each article, manufacturers are classified by LatinPanel into three quality levels: premium brands, private (distributor) labels, and priced brands.[12] The distributor brands account for only five percent of the value of purchases, so we will often concentrate on comparing premium to priced quality products. The households also report the distribution channel where they obtained each product. Eleven distribution channels are considered: hypermarkets, supermarkets, discount stores, self-service stores (*autoservicios*), grocery stores (*almacenes*), wholesalers, candy stores (*kioscos*), drugstores, welfare programs, bartering clubs (*trueque*), and a residual category for other channels such as community markets.

The purchase information is available for each ten-day period (for each month for the days 1st to 10th, 11th to 20th, and 21st to the end of month) from January 1, 2000 through December 31, 2002. For each period, for each pseudo, for each product, for each quality and for each distribution channel, the database indicates the number of households that bought the item, the total amount purchased, the total amount of money paid, the total number of units purchased, the average price, the number of days that households bought the item, and the number of times that households bought the item. The last two variables have only been collected since January 1st, 2001.

[12] LatinPanel also sells brand data at a more disaggregated level to its corporate clients.

The LatinPanel database does not contain information on income or labor supply variables. Only the profession and occupational status of the household head is surveyed for the socioeconomic level classification. We therefore also use data from the *Encuesta Permanente de Hogares* (EPH), an urban household labor force survey taken by Argentina's National Statistical Agency, INDEC, in May and October each year. We use the 2000-2002 surveys. Approximately 21,000 households and 80,000 individuals are surveyed each period. Income and labor supply variables are collected for the month prior to the survey, giving measures of income, unemployment, and labor hours for the months of April and September.[13] Within the EPH we construct the same pseudo-households as in LatinPanel, and obtain pseudo-means for the variables of interest. The mean number of households in the EPH within a pseudo is 43. Then although the EPH sample and the LatinPanel sample are of different households, the EPH provides data on mean income for households in a given pseudo, the mean labor hours of the head in a given pseudo, etc. These data will then be used to examine the effect in changes in income and labor conditions on LatinPanel outcomes..

3.1. What Share of Consumption Does LatinPanel Capture?

The last official household expenditure survey taken in Argentina was the Encuesta Nacional de Gastos de los Hogares (ENGH) in 1996/97. This survey still forms the basis for the weights used in constructing the consumer price index and the poverty line. In Appendix Table A1 we match the expenditure categories collected by LatinPanel with those in the ENGH to determine the share of total food expenditure and total expenditure that our LatinPanel data covers. Expenditure shares are given for Greater Buenos Aires, and are broken down by income quintile. Overall, LatinPanel food, beauty and cleaning products account for 16.7 percent of total expenditure, and the LatinPanel basket of food items accounts for 44.5 percent of total food consumed at home. As Engel's Law predicts, food share declines with income quintile, as does the LatinPanel food share. Given that the recession began in late 1998, we would therefore expect overall food shares to be higher over our sample period than in 1996/97, so that the LatinPanel data is

[13] More details of this survey are provided in McKenzie (2004).

likely to cover up to 20 percent of all non-durable expenditure.[14] As a further check, using the October 2002 EPH, we calculate that the mean across pseudos of the shares of LatinPanel expenditure in household income is 15 percent.

The main food items that LatinPanel does not collect are fresh fruit and vegetables, meat, and bread products. These items are largely non-branded, which is the reason LatinPanel does not collect data on them. Although these fresh food items are particularly important to the poor, the LatinPanel basket also contains a number of necessity items, such as milk, pasta, soup, cooking oil, and canned food. Moreover, as Figure 1b showed, inflation rates for the LatinPanel basket of goods followed a very similar pattern to the overall CPI and food CPI, which do contain such fresh items. As such, we believe that a basket of goods which contains 40-50 percent of household at-home food consumption, and whose prices move in line with overall food prices, should provide a reasonable approximation of how overall food expenditure patterns reacted to the crisis, and additionally provide representative information on cleaning and beauty product expenditure.

4. Basic Facts: Changes in Expenditure, Quantity, Quality, Days and Channels

4.1. The Change in Expenditure

Figure 2 plots mean monthly LatinPanel expenditure. To examine changes in real expenditure, three inflation measures are used. A standard approach would be to deflate using the official CPI, which is the first measure used. Such a measure provides an indicator of how much the LatinPanel expenditure fell after adjusting for changes in the overall cost of living. However, as reported in Section 2.1, food prices increased by much more than the overall CPI in 2002, so using the overall CPI will underestimate the fall in the quantity of food, beauty, and cleaning products purchased by LatinPanel consumers. For this reason, the food CPI and a fixed-basket price index constructed from our LatinPanel data are also used as deflators.

[14] Food shares may be expected to rise, in addition to the income effect, if households reduce their consumption of semi-durables such as clothing as a smoothing mechanism during the crisis. See McKenzie (2003) for evidence of this during the Mexican peso crisis.

Although there is a lot of month-to-month seasonal and sample variability in expenditure, Figure 2 clearly shows a decline in total expenditure over the first part of 2002. This is particularly the case when the food CPI or LatinPanel deflator are used. The other two panels of Figure 2 show separately the mean expenditure on premium and priced products. There is a noticeable downward trend in purchases of premium quality products, whereas priced brand products do not exhibit such a trend.

Table 2 tests whether the differences across years seen in Figure 2 are significant. Nominal expenditure on LatinPanel products rose in 2002. Deflating by the overall CPI one finds a relatively small fall in expenditure of 3.5 percent, which is less than the 6.7 percent fall experienced in the recession of 2001. However, deflating by the food CPI or LatinPanel deflator results in a 9 to 11 percent fall in real expenditure in 2002. Given that real incomes in the EPH fell 32.4 percent between October 2001 and October 2002, this still represents substantial smoothing of the income shock experienced by households, but does show that household expenditure still fell by a relatively large amount, especially as this followed smaller falls in the recession which preceded the devaluation.

Panels B and C of Table 2 confirm the visual result in Figure 2 that the decline in expenditure is largely a decline in expenditure on premium products. Expenditure on priced products actually rose 2 percent, whereas expenditure on premium products fell 17.6 percent when deflating by the food CPI. Panel D of Table 2 breaks down the change in expenditure by the quartile of the pseudo in the total expenditure distribution for the year 2000. Real expenditure is seen to have fallen for all quartiles in 2002, with the largest reductions seen for the top quartile.

4.2. Changes in Quantity

A more direct measure of the change in consumption during the crisis period is to examine changes in the physical quantities of goods obtained by consumers as a result of their purchases. Table 3 details the mean 10-day quantity of each of the 20 food products collected by LatinPanel. While some goods show reductions in quantity during 2001, there are much larger reductions in 2002. Eleven of the 20 products show a 15 percent or

larger decline in the mean quantity purchased in 2002 compared to 2001, while only yerba mate (a local tea) and pasta show significant increases.[15] While it is difficult to know how to aggregate units, a first approximation is to examine the change in total kilograms and litres consumed. Total kilograms of products fall 9.6 percent in 2002, while total litres fell 13.7 percent, compared to falls of 2.4 and 3.7 percent respectively in 2001. This change in aggregate quantities is comparable to the fall in real expenditure of 9 to 11 percent in 2002 calculated using the food CPI and LatinPanel food index, suggesting that these are appropriate deflators. In addition, recall from Table 1 that aggregate real private consumption growth for 2002 was negative 14.4 percent. Therefore, despite relative prices for food increasing in 2002, food consumption fell by less than overall consumption. This can therefore be viewed as evidence that the share of expenditure allocated to food rose during the crisis.

4.3. Change in Shopping Frequency

Beginning in January 2001, LatinPanel began collecting information on the particular day within each 10-day period when each purchase was made. Figure 3 uses this data to graph the monthly means of the number of days each household spent shopping over each 10 day period in 2001 and 2002. Panel A of Table 4 tests whether the mean shopping frequency in 2002 differs from that in 2001. We see that households start shopping more frequently in 2002, with the mean shopping frequency rising from 5.0 days per 10-day period in 2001 to 5.2 days per 10-day period in 2002. This increase translates into almost two-thirds of households shopping an extra day each month. Figure 3 shows that this increase comes entirely through additional days spent shopping for priced products, with shopping frequency actually falling for premium products. This continues to hold true when we condition on individuals buying some premium products, so does not simply reflect people stopping shopping for these products altogether.

[15] Yerba mate is a traditional tea beverage known to reduce hunger, which may explain its increased use. See http://rain-tree.com/yerbamate.htm for scientific evidence on its appetite suppressing effects.

4.4. Change in the Number of Channels used for Shopping

The LatinPanel data also allow us to examine changes in the location of purchases, in addition to changes in the frequency of purchase. The data provides information on which of ten possible channels a purchase is made at (we exclude welfare programs as goods obtained through this channel are not purchased). Figure 4 graphs the monthly mean number of channels shopped at per household within each 10-day period, while panel B of Table 4 tests whether the changes observed are statistically significant. Total channels shopped at remained fairly stable between 2000 and 2001, increasing dramatically from the last few months of 2001. The mean number of channels shopped at within a 10-day period rose from 2.39 in 2001 to 2.58 in 2002. This increase translates into sixty percent of households shopping at an additional channel each month. The largest increase in channels occurs for purchases of priced products, but even premium products, which people reduced expenditure on, show a small increase in the number of channels used for shopping.

This growth in the number of channels cannot be explained by an increase in the number of suppliers. On the contrary, ACNielsen (2003) reports a reduction in the total number of stores in Argentina of 9.6% between 2001 and 2002 (no change between 2000 and 2001). Moreover, the measured increase is not induced by tiny purchases at new channels. Panel C of Table 4 shows a reduction in Herfindahl indexes of expenditure shares across channels.

Note, however, that LatinPanel only registers the channels at which consumers are effectively making purchases. These may differ from the total number of stores visited for two reasons. Firstly, an increase in search will not be captured if a consumer increases search by going to more channels, but does not buy anything from these new channels. Secondly, since we do not observe which store within a channel a consumer shops at, there could also be a change in the number of stores within a channel. For example, consumers may now shop at two supermarkets instead of one.

To examine further which channels account for this increase in total channel use, Table 5 reports the proportion of buyers using each channel. This is broken down by socioeconomic level for 2001 and 2002. The increase in the number of channels used is seen to arise from an increase in use of down-the-trade channels such as autoservicios, almacenes, kioscos and wholesalers. These channels are generally used more often by lower socioeconomic classes, but all socioeconomic levels increased their use of these channels during the crisis. There is also an increase in the use of other channels, which includes community markets. The rise of *trueque* (barter) is seen in an increase from practically zero people using this channel to around 2 percent, with this channel being more used by the poor. In contrast, the up-the-trade channels of hypermarkets and supermarkets actually see some falls in usage. These channels were most often used by the upper socioeconomic classes before the crisis, who are now seen to be switching to alternative channels.

4.5. Quality Substitution

The majority of the increased search was in the form of consumers increasing the number of days shopping for and the number of channels shopped at for lower quality priced products. While it has long been recognized that consumers are likely to substitute towards lower quality products when their income falls, prior data sets have not allowed researchers to examine the quantitative importance of reductions in quality as a crisis adjustment mechanism. For example, Burstein, Eichenbaum, and Rebelo (2004) argue that the substitution of high quality branded imported products to low quality, often unbranded, domestic products is a key factor in accounting for the low pass-through of depreciations into inflation. However, they acknowledge that at present the evidence for the extent of this behavior is largely anecdotal. Our study of quality substitution provides more systematic evidence of the importance of this channel.

Surveys certainly suggest that quality substitution was used by many households during the crisis. Fiszbein, Giovagnoli and Adúriz (2002) report that 92 percent of their survey respondents said that they had substituted for cheaper products as one of their responses to the crisis. A Gallup poll in May 2002 found 87 percent of respondents saying that they

had bought brands of lower quality than they had usually purchased (Gallup, 2002). However, in order to adjudge the importance of this mechanism, more detailed information on the share of consumption subject to quality substitution is needed.

Table 6 explores the extent to which consumers substituted towards lower quality. The mean expenditure share on premium brand products is reported across all consumers in our survey, and by quartile of the total 2000 expenditure distribution. These expenditure shares on premium brand, high-quality products are reported separately by year for the basket of all products, and separately for food, cleaning, and beauty products. Overall, consumers reduced the expenditure share on premium brand products by 5 percentage points in 2002 (from 55.2% to 50.0%). Similar reductions were seen for each quartile of expenditure, suggesting that quality substitution was not just something done by the middle class. This rules out suggestions that the poor have no possibility of reducing quality since they already consume the lowest quality of each product, or that the rich are able to avoid taking such measures.[16] There is some variability across products in terms of the amount of quality substitution. Consumers reduced their share of premium brand cleaning products by eleven percentage points, compared to only a four point drop for beauty products.[17]

5. Explaining the Increase in Shopping Frequency

Households are seen to have increased both the number of days per period which they shop, and the number of channels they go to in doing their shopping. We combine these two measures into channel-days to obtain an overall measure of shopping frequency. For each pseudo-household, the number of channel-days is the sum over the ten different channels (excluding welfare programs) of the days spent shopping at each channel, divided by the number of households in the pseudo. Both more days spent shopping at the same channel, and more channels shopped at on the same day will increase this measure.

[16] This is true even when we consider deciles of the 2000 expenditure distribution. Both the top and bottom decile reduced their expenditure share on premium products by 4.7 percentage points in 2002.

[17] As explained in section 3, for each article LatinPanel classifies manufacturers (not products) into quality levels. Thus, our measures may underestimate quality substitution as we do not observe substitution across different versions produced by the same manufacturer (or by manufacturers of similar quality).

On average each pseudo-household spent 6.15 channel-days shopping each 10-day period in 2001, which increased to 6.63 in 2002.

5.1. The Income Level Effect

A first potential explanation for the increase in shopping frequency observed during 2002 is that it just reflects an income effect. As real incomes fell with the crisis, the opportunity cost of time decreased, and therefore consumers may be expected to substitute time for expenditure. As Becker (1965, p. 516) writes "women, the poor, children, the unemployed, etc. would be more willing to spend their time in a queue or otherwise ferreting out rationed goods than would high-earning males". Aguiar and Hurst (2004) find that retired households are 25 percent more likely to shop for food at least once a week than are nonretirees. Following Becker, they argue that when time is cheap, individuals are more likely to substitute toward time intensive activities like searching for sales across multiple stores.

We first employ a non-parametric analysis to examine the cross-sectional relationship between income and shopping frequency prior to the devaluation. We take total household labor income from the EPH labor force survey deflated by the overall CPI and match it by pseudo-household to the corresponding months of 2001 in the LatinPanel data. The local linear regression of Fan and Gijbels (1996) is then used to examine non-parametrically the relationship between the number of days spent shopping and log real labor income.[18] The top plot in Figure 5 graphs the estimated cross-sectional relationship between shopping frequency and real labor income in 2001. We see that the number of channel-days spent shopping first increases, and then decreases with growing income. That is, it is the middle of the distribution who shop most frequently. An increase in income has two counteracting effects on shopping frequency. More income leads to higher expenditure within a given week, which will tend to increase shopping frequency as consumers shop for more goods. However, more income also increases the opportunity cost of time as discussed above, leading to less shopping frequency. For the top half of

[18] The Epanechnikov kernel was used with a bandwidth of approximately one-half of the observations.

the income distribution this second effect dominates, so shopping frequency declines with income.

Semi-parametric estimation can be used to control for the quantity of products purchased, enabling us to separate the two effects of higher income. We use Yatchew's (1997) higher-order differencing[19] method for two-step estimation of the following partial linear model:

$$Shopping\ Freq_h = g(\log income_h) + \sum_{j=1}^{37} \beta_j q_{j,h} + \varepsilon_h \quad (1)$$

where $q_{j,h}$ is the quantity of product j purchased by pseudo h. Local linear regression is then used in the second step to estimate the function $g(.)$, which is plotted in the lower half of Figure 5. One sees that after controlling for the quantity of products purchased, shopping frequency is strictly decreasing in log labor income, and close to linear. That is, a poorer household spends more days shopping and/or goes to more channels than a richer household in order to purchase the same quantity of products.

The cross-sectional evidence therefore suggests that as consumers become poorer, they will increase their shopping frequency. However, these results may reflect other determinants of shopping frequency that are correlated with income in the cross-section. Blaylock (1989) models and estimates the determinants of grocery shopping frequency in the United States. In addition to income, he finds shopping frequency to depend on consumer tastes for shopping, preferences for fresh foods, and household size and structure. We assume that preferences for shopping did not change during the crisis, so that households did not suddenly derive more utility (or disutility) from the act of shopping in 2002. We then use pseudo-household fixed effects to control for preferences and other household-specific determinants of shopping frequency. McKenzie (2004) shows that there was little change in household size or structure during the crisis, so the use of fixed effects will also control for these factors.

[19] We use a differencing order of five.

As noted, LatinPanel does not collect income data, and so in our panel analysis we are forced to use several proxies for income. In Table 7 we begin by simply using a 2002 dummy to account for the crisis. This has the advantage of capturing the effect of both transitory and permanent changes in income suffered by households, but the obvious disadvantage of also capturing other effects of the crisis on shopping frequency. We will discuss and attempt to control for a number of these additional factors, but realize the limitations of this measure. In Table 8 we instead use the real monthly wage as our measure of aggregate income. This real monthly wage series is calculated from the nominal average wage for employees contributing to the Social Security System provided by the Ministry of Finance (see http://www.mecon.gov.ar), deflated by the CPI. The series has the advantage of being available for every month in 2001 and 2002, and captures well the average level of income. The disadvantage is that it does not vary across households, and so is identified only from aggregate variation. In Table 9 we therefore return to using the labor force survey (EPH) data in order to estimate the mean log household labor income for each pseudo-household. This income measure is only available for the months of April and September each year, but varies both over time and across pseudos. As a result, this measure should allow more accurate estimation of the effect of income on shopping frequency, but less precision in controlling for other determinants of shopping frequency which vary only over time.

Column 1 of Tables 7, 8 and 9 then shows the effect of income on shopping frequency after controlling for pseudo-household fixed effects, but without any other controls. Column 2 of each Table then adds controls for the quantity of each product purchased. Quantity has a positive effect on shopping frequency, and since quantity fell in 2002, controlling for quantity results in a stronger effect of income. The results confirm the negative effect of income on shopping frequency found in the cross-section. The 2002 dummy in Table 7, which reflects lower income, is positive, showing consumers shopping 0.66 channel-days more per 10-days to buy the same quantity of items. Table 8 shows the 150 real peso fall in average income between 2001 and 2002 is associated with consumers shopping 0.6 more channel-days per 10-day period, while Table 9 shows that

the 0.34 fall in log household labor income between 2001 and 2002 is associated with an increase of 0.34 channel-days per 10-day period.

5.2. Shopping More as an Adjustment to Shocks

Households increased their shopping frequency during the crisis. As shown above, part of this represents an aggregate income level effect, whereby households as a whole saw their incomes fall and so shopped more frequently. In Column 3 of Tables 7 and 8 we now add a measure of the fall in labor income between 2001 and 2002 experienced by each pseudo-household. This is constructed by using the EPH labor force survey to estimate mean real log household labor income for each pseudo in 2001 and in 2002 and interacting this change with the 2002 dummy variable. The results show that pseudo-households whose labor income fell by more during the crisis were the ones who increased shopping frequency the most. This provides evidence that the increase in shopping frequency is not just an aggregate effect of the crisis, but is an adjustment mechanism used more by those households who suffered more during the crisis.

5.3. More Time to Shop?

Although a common response to an idiosyncratic shock is to send another household member to work or to increase own labor hours, rising unemployment and low labor demand make this more difficult to achieve during covariate shocks. McKenzie (2004) finds that mean household labor hours actually fell by an average of 5 hours per week during the crisis and that more than one quarter of all workers reported wishing to work more hours than they currently did. As a result, households unable to take their labor to the market may have substituted towards non-market uses of time, such as home production and increased shopping time. Fiszbein, Giovagnoli and Adúriz (2003) provide some evidence for this in their finding that 60% of households in their survey report increases in time dedicated to doing housework, including preparing meals.

In Column 4 of Tables 7 and 8 we therefore control for the change in household labor hours as well as the change in household labor income. The change in household labor hours has a small and insignificant coefficient in all specifications. This shows that once

one accounts for the effects of unemployment or changes in labor hours on labor income, there is no additional effect of the changes in the time spent at work on shopping frequency.

5.4. Other Direct Effects of the Crisis on Shopping Frequency

In addition to the large fall in income, the crisis was accompanied by other substantive changes in the Argentine economy which are likely to also have affected shopping behavior. The most important of these are the change in liquidity for consumers as a result of the *corralito*, the effect of inflation, and the effect of changes in price dispersion.

The *corralito* restricted the amount of funds which could be withdrawn from bank accounts each month, reducing liquidity. As a result, we would expect liquidity-constrained consumers to have less cash on hand, and be forced to shop more frequently for a smaller number of items each time. We measure the strength of the liquidity effect of the *corralito* using the corralito premium defined in Section 2.2.

As seen in Figure 1b, inflation surged following the devaluation of the peso, reaching a peak of 13 percent a month in April of 2002, before subsiding towards the end of 2002. For a single product, Casella and Feinstein (1990) and Tommasi (1999) argue that the direct effect of inflation is to reduce search. In their models, consumers hold nominal balances while shopping. As a result, traders spend less time searching for the best price, since the cost of search is higher in terms of depreciating nominal money. However, since LatinPanel consumers buy several goods at once from a particular store, the consumer problem is really one of joint search. Nevertheless, as Carlson and McAfee (1984) show, many of the insights of the single-product search models will transfer to the joint search problem. They show that, with joint search and a cost of returning to stores already searched, the optimal sequential search strategy uses a reservation sum for any subset of items. When the observed prices for the desired basket of goods at a particular store total more than the corresponding reservation sum, the consumer will purchase at most only a subset of items and continue searching for the remaining items at other stores. Search will

terminate if and only if the observed price vector falls within the reservation sum for every subset of items.

Inflation will therefore lower the reservation price for each single product, and the reservation sum for any subset of items. A lower reservation price for each single product will tend to lower shopping frequency, as consumers search less across stores or over days for the same product. However, a lower reservation sum across subsets of items makes it more likely that in any given store or on any given day, some subset of items is below the reservation sum so that a transaction occurs. Since we only measure shopping frequency in terms of realized transactions, and not in terms of search activity itself, shopping frequency may increase or decrease with inflation. We include the monthly food inflation rate as a control in our regressions to capture these effects.

In addition to the direct effect of the level of inflation on search activity, inflation is generally also accompanied by increasing price dispersion. Empirically, Van Hoomissen (1988) examines the prices for the same products across different stores in Israel during periods of varying inflation rates and finds that price dispersion increases with inflation at a decreasing rate. Her explanation is that inflation results in the ranking of prices across stores changing from period to period. The result is that the stock of knowledge that consumers have about where to find the best prices depreciates more quickly with higher inflation. As a result, consumers engaged in search will find it optimal to hold a lower *stock* of knowledge about prices when search is costly. Van Hoomissen makes clear that this does not necessarily mean that consumers will choose to search less during inflation as more search may be necessary to hold a smaller stock of information. However, as a result of consumers holding less information, price dispersion will increase with inflation.

Tommasi (1994a) builds on this explanation by considering consumer search with repeated purchase, which fits the context of grocery-shoppers in this paper. In his model, inflation depreciates the information which current prices convey about future relative

prices.[20] Tommasi (1994b) provides evidence for this. Using weekly prices from Buenos Aires supermarkets from 1990-91, he finds that the forecast error in predicting future prices from current prices was higher during periods of higher inflation. As in Van Hoomissen's model, although consumers hold smaller stocks of information, the investment flow of information, which may be measured by the expected number of stores visited in a given period, may increase or decrease. Tommasi points out that there are two counteracting forces at work. A lower correlation of prices over time makes it less likely that the lowest cost store this time will be the lowest in the next period, increasing the number of stores visited. However, if the lowest priced store this period turns out to have higher prices next period, the higher reservation acceptance price makes the consumer search less. The net effect of increased price dispersion on search is therefore uncertain, and depends on the underlying distribution of equilibrium prices. We control for price dispersion using a weighted coefficient of variation in prices paid by pseudos for all products (see Figure 1c and section 2.1).

Column 5 of Tables 7 and 8 and Column 3 of Table 9 examine the effect of controlling for the corralito, inflation, and price dispersion as additional determinants of shopping frequency. Adding these controls to Table 7 reduces the magnitude of the 2002 dummy from 0.46 to 0.24, indicating that this dummy variable was capturing more than just the income effect of the crisis. Nevertheless, the coefficient on the change in household labor income shows very little change, and continues to show that those households whose income fell most during the crisis were the ones whose shopping frequency grew the most, even after controlling for these other effects of the crisis. A similar result is seen in Table 8, with the effect of the aggregate income weakening slightly, while the household level income change coefficient does not change significantly. Likewise, the magnitude of the income effect also falls in Table 9 once we control for these other variables.

In all three specifications we find that higher price dispersion is associated with lower shopping frequency, while in both Tables 7 and 8 we find a positive association between

[20] Ball and Romer (2003) provide a model which derives this link between inflation and price dispersion, in a context similar to Tommasi (1994a), in which buyers enter long-term relationships with sellers.

inflation and shopping frequency. We obtain a negative coefficient on inflation in Table 9, although this appears to reflect multicollinearity present in the much shorter time series available with the individual income data.[21] The corralito is found to have a small, but positive effect on shopping frequency, in accordance with the view that less liquidity results in more shopping.

A potential concern is that changes in shopping frequency could themselves have an effect on inflation and price dispersion if shopping more changes the price consumers pay for a product. To counter this endogeneity concern, we instrument inflation with the one-month lag in the peso depreciation rate, and price dispersion with the concurrent peso depreciation rate. These instruments are strongly correlated with inflation and price dispersion.[22] It also seems reasonable to argue that apart from the effect through prices, changes in the exchange rate had no other significant direct effects on household shopping frequency, thereby satisfying the exclusion restriction.

Column 6 of Tables 7 and 8 and Column 4 of Table 9 show the instrumental variable fixed effect results. Instrumenting price dispersion and inflation results in no significant changes in the estimated income effects, and some changes in the magnitude but not sign of the other variables. We still find a negative effect of price dispersion on shopping frequency. This accords with the fact that price dispersion was highest in March and April, when the peso was depreciating rapidly, and lower at the end of 2002, whereas shopping frequency continued to rise throughout the year. A one standard deviation increase in price dispersion (0.029) is associated with between a 0.19 and 0.27 fall in shopping channel-days. In Tables 7 and 8 we find a positive effect of inflation, whereas Table 9, with only four months to identify the effect of inflation from, shows a negative effect.[23] However, in all cases a one standard deviation increase in inflation (3.1 percent) is associated with less than a 0.1 change in channel-days. The corralito restrictions show

[21] This interpretation is supported by inflation having a significant and positive coefficient when price dispersion and the corralito are omitted from Column 3 of Table 9.
[22] A time series regression of inflation on the depreciation and lagged depreciation instrument has an F-statistic of 61.9 on these two instruments, while a time series regression of price dispersion on depreciation and lagged depreciation has a F-statistic of 34.4.
[23] We obtain a positive effect when we omit price dispersion and the corralito premium.

consumers shopping more often with less liquidity, with a one standard deviation increase in the premium (4 percent) associated with a 0.6 increase in channel-days. Finally, columns 5 and 6 of Table 9 replicate the format of the last columns in Table 7 and 8 for comparison purposes. We find both an effect of the level of income and the fall in average income between 2001 and 2002 on increasing shopping frequency.

Controlling for these other factors, from Column 6 of Table 8 we estimate that the overall income effect of the crisis, consisting of the 150 real peso fall in average income and the 0.34 fall in log household labor income, was a 0.39 increase in channel-days per 10-day period. Comparing this to the 0.66 increase in channel-days conditional on quantity found in Column 2 of Table 7, we see that the fall in income accounts for approximately 60 percent of the increase in shopping frequency during the crisis.

5.5. Robustness

Table 10 examines the robustness of the estimated income effects to alternate measures of price dispersion and inflation, and to the inclusion of a control for banking holidays. The baseline specification we check is Column 6 of Table 8, which contains the instrumented fixed effect results, using the aggregate real wages as our measure of the overall income shock. Row 1 of Table 10 repeats the coefficient estimates on average real wages and on the pseudo-level change in income. This baseline specification uses a measure of price dispersion which is calculated after trimming the top and bottom 1 percent of observations to control for outliers. Rows 2 and 3 show that the income effects remain robust to the use of non-trimmed data, or to trimming the top and bottom 5 percent of observations. Price dispersion is still found to have a significant negative coefficient in both cases. Row 4 replaces the food inflation rate with the overall inflation rate as a control. We again find a significant positive effect of inflation, with no significant change in the estimated income effects.

In addition to the corralito, the Argentine Government imposed a number of exceptional banking holidays. The three major periods were from December 21, 2001, to January 10, 2002; February 4, 2002, to February 8, 2002; and April 22, 2002 to April 26, 2002.

During these periods liquidity was further tightened as ATMs were quickly emptied of cash and most banking transactions were halted. In Row 5 of Table 10 we add a dummy variable for a period with banking holidays to our baseline specification to see whether this additional liquidity effect matters in terms of estimating the effect of income on shopping frequency. There is no change in the income coefficients from the baseline specification, and the banking holiday dummy variable is insignificant. Our estimates therefore are robust to a number of alternate specifications and show a strong effect of income on shopping frequency during the crisis period.

6. How Important is this as a Crisis Adjustment Mechanism?

Households generally rely on a number of coping strategies in response to a shock. In judging the relative importance of increases in shopping frequency among these, it is important to consider both the prevalence of households using this strategy, and the magnitude of the gains to each household made possible by doing so. We examine each in turn.

6.1. Prevalence

Increasing shopping frequency is an adjustment mechanism that can be employed by a large number of households during an aggregate shock, in contrast to many other adjustment mechanisms. In Table 11 we calculate the percentage of pseudo-households that increased their shopping days, shopping channels, and channel-days in total in 2002 compared to in 2001. Over 61 percent of households are found to have increased their shopping days, 76 percent increased the number of channels used, and 66 percent increased their channel days. Moreover, when we look at the use of this mechanism across 2001 income quartiles, we see that the increase in shopping frequency applied across the income distribution, with the lowest income quartile showing the least prevalence. As shown in the previous section, shopping frequency is decreasing in income once we condition on quantity, so the poorest households would have already been shopping more frequently in 2001, and so perhaps had fewer gains to be realized from increasing their shopping frequency further.

For comparison, we use the EPH to calculate the percentage of pseudo-households increasing their household labor hours over this same period. Only 36 percent of households are seen to have increased labor hours, while 63 percent reduced labor hours, and less than one-third of households in the top three quartiles increasing labor hours. Moreover, McKenzie (2004) shows that the proportion of households increasing their labor hours was actually lower in 2002 than in the previous years, so that much of the increase in labor hours can be seen as standard labor market churn, rather than a specific response to the crisis.

Further evidence as to the relative importance of changes in consumption behavior compared to other adjustment mechanisms is provided by Fiszbein, Giovagnoli and Adúriz (2003), who conducted a special survey in mid-2002 which directly asked households whether they had used a variety of coping strategies. They find that almost all households report changing their patterns of consumption in response to the crisis, with 75 percent reducing consumption of food, 92 percent replacing food items with cheaper products, and 37 percent purchasing non-food goods of a lower quality brand. In comparison, only 15 percent of households said that they had worked more hours, 13 percent sent more members to the labor market, 11 percent used loans from family members and friends, 5 percent used their savings and less than 2 percent used bank loans. As a result, in terms of prevalence, increases in shopping frequency and the associated changes in consumption patterns are one of the most used coping strategies.

6.2 What are the benefits of shopping more?

In order for the increase in shopping frequency observed during the crisis to be useful as an adjustment mechanism, more frequent shopping must confer benefits upon households. Viewing the frequency of shopping as an indicator of search suggests at least two gains to be made from more shopping. The most obvious is that by going to more stores consumers are able to find lower prices for the same products. A second potential advantage is that more search allows consumers to identify other brands and, in particular, be able to substitute less known and less expensive brands for premium quality items. We examine each of these explanations in detail, but also note that there may be

other benefits to consumers of more frequent shopping which our data does not allow us to measure. For example, consumers may save on gasoline and other transportation costs by switching from a once a week shopping trip in the car to the supermarket towards more frequent trips by foot to nearby local stores.

To estimate the change in prices associated with a change in shopping frequency we estimate the following baseline equation for good *i* of quality *q* purchased in time period *t* by pseudo-household *h*:

$$\ln\left(price_{i,q,t,h}\right) = \gamma_{i,q,t} + \beta\, Channeldays_{t,h} + \lambda_h + \varepsilon_{i,q,t,h} \qquad (2)$$

The term $\gamma_{i,q,t}$ captures the effect of inflation, allowing this to differ by product and quality. The pseudo-household fixed effect λ_h is intended to capture the effects of location and household characteristics which may be related to both the price paid by a pseudo-household on average and its shopping frequency. However, controlling very generally for time effect and pseudo-household fixed effects removes a lot of the variation in the data, making it harder to identify β. For these reasons we also present results from alternate specifications. For comparison we first give results without fixed effects, which may overstate the gains from shopping more if omitted household characteristics influence both prices and shopping frequency. As a compromise, we provide results from an intermediate specification, which controls for location and household size, two of the key characteristics we would be concerned about. A second set of specifications replaces the very general product-quality time effect $\gamma_{i,q,t}$ with $\delta_{q,t} + \eta_i$, which demeans each product and then allows for different inflation rates for premium and priced products. In carrying out this estimation, we weight equation (2) by the average expenditure share on the product by consumers in 2000, so that price gains on items which comprise a larger share of household budgets are given more weight.

As discussed in the previous section, there are a number of reasons for the increase in shopping frequency observed during the crisis, with only part of the effect due to the fall in income. Inflation and price dispersion were also found to have an effect on shopping

frequency. As a result, channel-days is likely to be endogenous to prices in equation (2). To counter this concern and isolate the effect of increases in shopping frequency due to lower income on prices paid, we use EPH income as an instrument for shopping frequency. This instrument was already shown to be strongly correlated with shopping frequency.

Table 12 then presents the resulting estimates of β using these different methods. Since the dependent variable is log prices, 100* β can be interpreted as giving the change in prices associated with one more channel-day shopping. In the cross-section, and after adding controls for location and household size, one finds a strong negative effect of shopping frequency on prices. One more channel-day of shopping is estimated to result in a 5-6 percent saving in prices. The coefficients are closer to zero when pseudo-household fixed effects are included, which may reflect measurement error attenuation bias. Nevertheless, the coefficients retain a negative sign, and in the specification with the more parsimonious set of time controls, the estimated effect of a 3 percent fall in prices is marginally significant (p-value of 0.12). Overall then, we estimate the effect of one more channel-day shopping to be a 3-6 percent reduction in prices.

Shopping at a wider variety of stores may also provide consumers with more choice over brands, and substitute priced brands for premium quality items. Priced goods have a price which is on average only 83 percent of the price of premium goods in our data. Although this price differential may reflect actual or perceived quality differences, consumers may be willing to substitute towards priced goods in order to maintain the quantity of food and other items consumed as their incomes fall. The change in the percentage share of priced goods for product *i* purchased in time *t* by pseudo-household *h* from a change in shopping frequency is estimated according to the following equation:

$$pricedshare_{i,t,h} = \theta Channeldays_{t,h} + \pi_h + \nu_{i,t,h} \qquad (3)$$

Again we instrument channel-days with EPH income. We obtain an estimate of θ of 11.5 with a highly significant t-statistic of 7.52. That is, shopping one more channel-day is

estimated to increase the share of priced goods by 11.5 percentage points. If consumers save 17 percent of the price by doing so, then one more channel-day saves consumers an additional 1.96 percent as a result of switching qualities.

Combining the above results, we have that shopping one more channel-day is associated with a 3-6 percent fall in the price paid for the same products, along with a 2 percent saving from switching to cheaper brands. Recall that the estimated increase in channel-days resulting from the income effect of the crisis was 0.39 days per 10-day period. Therefore the estimated average savings to consumers from shopping more frequently as a response to falling income is a 2.0 to 3.2 percent saving in the price of food, beauty and cleaning products. These savings in price allow a given level of expenditure to buy more, and thereby mitigate approximately 20 to 30 percent of the 10 percent fall in real expenditure on these items seen in Table 2.

7. Conclusions

Argentine consumers reacted in part to the crisis by changing their shopping behavior. Although consumers bought less after the devaluation, they shopped more days. This increase in shopping frequency occurred over a wider variety of channels, and was almost entirely through increased shopping for priced products. The share of expenditure allocated to premium brand products fell for all parts of the expenditure distribution, suggesting that consumers were also reducing the quality of their goods purchased during the crisis.

Our analysis shows that part of this increase in shopping frequency can be attributed to the fall in real incomes experienced by consumers during the crisis. Inflation, price dispersion, and illiquidity effects of the *corralito* are also found to play a role in accounting for the changes observed in shopping frequency. However, the continuation of high frequency shopping behavior towards the end of 2002, when these effects had subsided, suggest that the fall in income was the prime determinant. More frequent shopping is found to be associated with consumers paying lower prices for the same products, and shifting a portion of their expenditure from premium to priced goods. Our

calculations suggest that on average consumers were able to save 2 to 3.2 percent of the cost of their food, beauty and cleaning products by increasing shopping frequency, allowing them to mitigate 20 to 30 percent of the fall in food expenditure. Therefore these changes in shopping behavior appear to have been an important adjustment mechanism during an aggregate shock.

These observed changes have several further implications for the measurement of the impact of economic shocks. Nutrition-based poverty lines will tend to overestimate the increase in poverty when expenditure is used for calculations, since the adjustments in shopping behavior change the relationship between expenditure and the consumption arising from it. However, just as consumption growth may be overstated during periods of economic progress due to quality upgrading (see Klenow, 2003), the quality downgrading we observe during economic crises may result in an underestimate of the fall in quality-adjusted consumption, thereby understating utility-based welfare measures. Changes in the locations at which consumers shop are also likely to further result in inflation being mismeasured during crises.

Appendix 1: Classification of Household Socioeconomic Levels

Following the methodology of the Argentine Marketing Association, LatinPanel classifies households by socioeconomic levels in the following way. First, households are assigned index points according to the maximum educational attainment of the household head (up to 32 points), the profession and occupational status (employee, employer, self-employed, unemployed, or retired) of the household head (up to 40 points), the possession of home appliances and use of services such as personal computers, credit cards, washing machine, dishwashing machine, telephone, color TV, video, and freezer (up to 14 points), and the quality and age of the car/s owned (up to 14 points).[24] For each household, the index takes values between 4 and 100 points. Households are then classified into four socioeconomic levels according to the following table:

SOCIOECONOMIC LEVEL	POINTS
ABC1 - High income	64-100
C2C3 - Middle income	35-63
D1 - Upper-low income	27-34
D2E - Low income	4-26

For the households included in the LatinPanel sample throughout the period of analysis, 5.8% of the households changed SEL between 2000 and 2001 and 7.2% between 2001 and 2002. These small rates of SEL change are explained by the broadness of the categories and the fact that the index awards points to several characteristics not immediately affected by the crisis.

[24] For the assignment of points for each concept and further details, see Asociación Argentina de Marketing (1998).

References

ACNielsen (2003) "Fin del 2003: Un Nuevo Escenario", Buenos Aires, November.

Aguiar, Mark and Erik Hurst (2004) "Consumption vs. Expenditure", mimeo., University of Chicago

Asociación Argentina de Marketing (1998), "Indice de Nivel Socio Económico Argentino".

Ball, Lawrence and David Romer (2003) "Inflation and the informativeness of prices", *Journal of Money, Credit, and Banking* 35(2): 177-196.

Becker, Gary S. (1965) "A theory of the allocation of time", *The Economic Journal* 75(299): 493-517.

Blaylock, James R. (1989) "An economic model of grocery shopping frequency", *Applied Economics* 21: 843-852.

Burstein, Ariel, Martin Eichenbaum, and Sergio Rebelo (2004) "Why is inflation so low after large devaluations?", mimeo., Department of Economics, UCLA.

Burstein, Ariel, Martin Eichenbaum, and Sergio Rebelo (2003) "Large devaluations and the real exchange rate", mimeo., Department of Economics, UCLA.

Calvo, Guillermo, Alejandro Izquierdo, and Ernesto Talvi. 2002. "Sudden Stops, the Real Exchange Rate and Fiscal Sustainability: Argentina's Lessons." Background paper prepared for the Annual Meetings of the Inter-American Development Bank. Fortaleza, Brazil, 11 March 2002.

Carlson, John A. and R. Preston McAfee (1984) "Joint search for several goods", *Journal of Economic Theory* 32(4): 337-345.

Casella, Alessandra and Jonathan S. Feinstein (1990) "Economic exchange during hyperinflation", *Journal of Political Economy* 98(1): 1-27.

De la Torre, Augusto, Eduardo Levy Yeyati and Sergio L. Schmukler. "Living and Dying with Hard Pegs: The Rise and Fall of Argentina´s Currency Board." *Economía* 3(2), Spring 2003.

Dercon, Stefan (2002) "Income Risk, Coping Strategies and Safety Nets" *The World Bank Research Observer* 17(2): 141-66

Diamond, Peter A. (1993) "Search, sticky prices, and inflation", *The Review of Economic Studies* 60(1): 53-68.

Economist Intelligence Unit (EIU) (2002) *Country Report: Argentina*, March 2002, Economist Intelligence Unit: London.

Feldstein, Martin. 2002. "Argentina´s Fall: Lessons from the Latest Financial Crisis." *Foreign Affairs* 81(2): 7-14.

Fan, Jianqing and Irène Gijbels (1996) *Local Polynomial Modeling and Its Applications*, Monographs on Statistics and Applied Probability 66, Chapman & Hall: New York.

Fiszbein, Ariel, Paula Inés Giovagnoli and Isidro Adúriz (2002) "Argentina's crisis and its impact on household welfare", World Bank Office for Argentina, Chile, Paraguay and Uruguay Working Paper No 1/02.

Fiszbein, Ariel, Paula Inés Giovagnoli and Isidro Adúriz (2003) "El impacto de la crisis argentina en el bienestar de los hogares" (The impact of the Argentine crisis on household well-being) *Revista de la CEPAL* 79:151-167

Frankenberg, Elizabeth, James P. Smith and Duncan Thomas (2003) "Economic shocks, wealth and welfare", *Journal of Human Resources* 38(2): 280-321.

Galiani, Sebastián, Daniel Heymann, and Mariano Tommasi. "Great Expectations and Hard Times: The Argentine Convertibility Plan." *Economía* 3(2), Spring 2003.
Gallup (2002) "Estudio de Opinión Pública: Cambios en los hábitos de consumo", April 2002, Gallup Argentina, http://www.gallup.com.ar
Halac, Marina and Sergio L. Schmukler (2003) "Distributional effects of crises: the role of financial transfers", Mimeo., The World Bank.
Hausmann, Ricardo, and Andrés Velasco. 2003. "Hard Money's Soft Underbelly: Understanding the Argentine Crisis." In Brookings Trade Forum: 2002, edited by Susan M. Collins and Dani Rodrik (forthcoming). Washington: Brookings.
Klenow, Peter J. (2003) "Measuring consumption growth: The impact of new and better products", *Federal Reserve Bank of Minneapolis Quarterly Review* 27(2): 10-23.
Lustig, Nora L. (2000) "Crises and the Poor: Socially Responsible Macroeconomics", *Economia* 1(1): 1-30.
McKenzie, David J. (2004) "Aggregate shocks and labor market responses: Evidence from Argentina's financial crisis", *Economic Development and Cultural Change* 52(4): 719-758.
McKenzie, David J. (2003) "The consumer response to the Mexican peso crisis", mimeo. Stanford University.
Mussa, Michael (2002) "Argentina and the Fund: From Triumph to Tragedy". Institute of International Economics: Washington, D.C.
Obstfeld, Maurice and Kenneth Rogoff (2000) "The Six Major Puzzles in International Macroeconomics: Is There a Common Cause?", NBER Working Paper No. w7777.
Rao, Vijayendra (2000) "Price heterogeneity and "real" inequality: A Case-study of prices and poverty in rural South India", *Review of Income and Wealth* 42(2): 201-11
Skoufias, Emmanuel (2003) "Economic Crises and Natural Disasters: Coping Strategies and Policy Implications", *World Development* 31(7): 1087-1102.
Thomas, Duncan, Elizabeth Frankenberg, Kathleen Beegle and Graciela Teruel (1999) "Household budgets, household composition and the crisis in Indonesia: Evidence from longitudinal household survey data", mimeo, UCLA Department of Economics.
Tommasi, Mariano (1994a) "The consequences of price instability on search markets: toward understanding the effects of inflation", *American Economic Review* 84(5): 1385-1396.
Tommasi, Mariano (1994b) "Inflation and the informativeness of prices: Microeconomic evidence from high inflation", UCLA Department of Economics Working Paper No. 718.
Tommasi, Mariano (1999) "On high inflation and the allocation of resources", *Journal of Monetary Economics* 44: 401-421.
Van Hoomissen, Theresa (1988) "Price dispersion and inflation: Evidence from Israel", *Journal of Political Economy* 96(6): 1303-1314.
Weisbrot, Mark and Dean Baker (2002) "When "good parents" go bad: The IMF in Argentina", Center for Economic and Policy Research Briefing Paper, April 2, 2002.
Yatchew, Adonis (1997) "An elementary estimator of the partial linear model", *Economics Letters* 57: 135-143.

TABLE 1: MACROECONOMIC SUMMARY

Indicator	Source	1999	2000	2001	2002	2003
Real GDP growth (%)	a	-3.4	-0.8	-4.4	-10.9	8.8
Real private consumption growth (%)	a	-2.0	-0.7	-5.7	-14.4	8.2
Urban unemployment rate (May) (%)	b	14.5	15.4	16.4	21.5	15.6
Households below the poverty line (May) (%)	c	19.1	21.1	23.5	37.7	39.4
Peso/USD Exchange rate (annual average)	d	1.00	1.00	1.00	3.06	2.90
Inflation rates (%):						
Consumer Price Index (GBA)	e	-1.8	-0.7	-1.5	41.0	3.7
Consumer Price Index (Cordoba)	f	-3.5	-2.0	-3.3	50.3	4.0
Consumer Price Index (Santa Fe)	g	-4.8	-8.3	-1.4	70.6	-0.8
Food and Beverages Prices (GBA)	e	-5.1	-1.5	-2.1	57.9	4.7
Clothing Prices (GBA)	e	-3.9	-4.6	-3.2	58.7	7.4
Housing and Basic Services Prices (GBA)	e	1.0	-0.1	-1.6	13.1	4.6
Medical Expenses (GBA)	e	0.8	1.6	1.2	27.9	3.1
Transport and Communications (GBA)	e	1.8	1.6	-1.3	31.3	0.8
Leisure Expenses (GBA)	e	-0.9	-3.1	-3.4	54.0	4.3
Education Expenses (GBA)	e	0.4	-1.0	-1.9	6.8	2.1
Wholesale Price Index	h	1.2	2.4	-5.3	118.0	2.0
Producer Price Index	h	1.1	2.3	-5.6	124.9	1.9
Wholesale Prices of Imported Products	h	-1.9	-1.9	-3.5	204.5	-11.4

Sources and Notes:
Consumer Price Indices for Cordoba and Santa Fe use different baskets and different weights than the official price index for Greater Buenos Aires.
a: INDEC Quarterly GDP at constant prices series, www.indec.mecon.ar [Feb 16, 2004]
b: INDEC, total urban employment and unemployment from 1974 to present, www.indec.mecon.ar [Feb 16, 2004].
c: INDEC, Living Conditions, Poverty Lines and Basic Living Basket, www.indec.mecon.ar [Feb 16, 2004]
d: IMF, International Financial Statistics Online [accessed Feb 16, 2004]
e: Annual inflation, December to December, from INDEC for Greater Buenos Aires (GBA)
www.indec.mecon.ar [Feb 16, 2004]
f: Provincial Government of Cordoba, Cost of living index for City of Cordoba,
http://web2.cba.gov.ar/actual_web/estadisticas/índices.htm#uno [Feb 16, 2004]
g: Provincial Government of Santa Fe, Consumer Price Index, City of Santa Fe
http://www.santafe.gov.ar/gobernacion/ipec/indices/c0702001.xls [Feb 16, 2004]
h: INDEC wholesale price indices, www.indec.mecon.ar [Feb 16 2004]. Wholesale price indices include sales tax, whereas the producer price index does not.

TABLE 2: CHANGES IN EXPENDITURE

Dependent Variable	Mean of the dependent variable			Difference in Means		Percentage Change	
	2000	2001	2002	2000-01	2000-02	2000-01	2001-02
A: Total Expenditure on Food, Beauty and Cleaning							
Nominal 10-day expenditure	30.63	28.27	34.38	-2.36	6.11	-7.7	21.6
				(-11.88)	(23.39)		
10-day expenditure deflated by the CPI	30.68	28.62	27.61	-2.06	-1.01	-6.7	-3.5
				(-10.35)	(-4.85)		
10-day expenditure deflated by Food CPI	30.91	29.08	26.38	-1.83	-2.70	-5.9	-9.3
				(-9.11)	(-12.74)		
10-day expenditure deflated by LatinPanel price index	31.01	30.24	27.03	-0.77	-3.21	-2.5	-10.6
				(-3.79)	(-14.49)		
B: Expenditure on Premium Products							
10-day expenditure deflated by the CPI	18.08	16.08	14.07	-2.00	-2.00	-11.1	-12.5
				(-14.36)	(-14.02)		
10-day expenditure deflated by Food CPI	18.22	16.34	13.46	-1.88	-2.88	-10.3	-17.6
				(-13.37)	(-19.31)		
C: Expenditure on Priced Products							
10-day expenditure deflated by the CPI	11.31	11.03	11.98	-0.28	0.95	-2.5	8.6
				(-3.20)	(8.70)		
10-day expenditure deflated by Food CPI	11.39	11.21	11.43	-0.18	0.22	-1.6	2.0
				(-2.11)	(2.15)		
D: Total Expenditure deflated by Food CPI by 2000 Total Expenditure Quartile							
Bottom quartile	20.08	19.65	18.59	-0.43	-1.06	-2.2	-5.4
				(-1.30)	(-2.51)		
Second quartile	26.38	25.24	23.71	-1.14	-1.53	-4.3	-6.1
				(-3.91)	(-5.26)		
Third quartile	33.59	31.45	28.48	-2.14	-2.97	-6.4	-9.4
				(-6.72)	(-8.31)		
Top quartile	47.06	44.61	39.29	-2.45	-5.32	-5.2	-11.9
				(-3.78)	(-8.61)		

Notes: Robust t-statistics which allow standard errors to be clustered at the pseudo-level are shown in parentheses. Means and standard errors are also weighted by the number of households in a given pseudo.

TABLE 3: CHANGE IN QUANTITY PURCHASED

		Mean 10-day quantity						
Item	**Units**	**2000**	**2001**	**2002**	**2000-01**		**2001-02**	
Cooking Oil	Lt	1.073	1.026	0.932	-4.4	*	-9.2	*
Cocoa Powder	Kg	0.052	0.052	0.043	0.6		-17.9	*
Coffee	Kg	0.070	0.065	0.054	-6.9	*	-16.4	*
Yerba Mate & Tea	Lt	0.466	0.486	0.548	4.3	*	12.7	*
Dressings sauce	Kg	0.213	0.196	0.153	-8.0	*	-22.1	*
Biscuits	Kg	0.664	0.624	0.498	-6.0	*	-20.2	*
Breakfast Cereals	Kg	0.030	0.030	0.023	-1.8		-22.7	*
Pasta & noodles	Kg	0.925	0.926	0.963	0.1		3.9	*
Soups	Lt	1.245	1.151	0.957	-7.5	*	-16.8	*
Canned Food	Kg	0.702	0.713	0.645	1.7		-9.6	*
Milk	Lt	4.176	4.181	3.933	0.1		-5.9	*
Carbonated Drinks	Lt	5.761	6.096	5.052	5.8	*	-17.1	*
Bottled Water	Lt	5.432	5.148	4.115	-5.2	*	-20.1	*
Beer	Lt	1.002	0.879	0.784	-12.3	*	-10.8	*
Fruit Juice	Lt	5.308	4.589	4.074	-13.6	*	-11.2	*
Frozen Food	Kg	0.209	0.191	0.135	-8.6	*	-29.5	*
Icecream	Lt	0.296	0.268	0.193	-9.5	*	-27.9	*
Yoghurt	Lt	0.617	0.606	0.495	-1.7		-18.2	*
Butter	Kg	0.097	0.096	0.098	-1.9		2.1	
Margarine	Kg	0.052	0.047	0.046	-9.1	*	-2.1	
Total Kilograms		3.01	2.94	2.66	-2.4	*	-9.6	*
Total Litres		25.38	24.43	21.08	-3.7	*	-13.7	*

* indicates that the change is statistically significant at the 5% level
Lt denotes Litres, Kg denotes Kilograms

Table 4: Test of Difference in Mean Shopping Days, Number of Channels, and Concentration of Expenditure Shares.

Dependent Variable	Mean of the dependent variable 2001	2002	Difference in Means	% change
A: Days Shopping per 10 day period				
Total days spent shopping	5.03	5.21	0.185	3.7
			(7.42)	
Days shopping for premium products	3.47	3.35	-0.119	-3.4
			-(4.89)	
Days shopping for premium products conditional on buying some premium products	3.61	3.53	-0.081	-2.3
			-(3.44)	
Days shopping for priced products	3.63	3.93	0.298	8.2
			(12.58)	
Days shopping for priced products conditional on buying some priced products	3.79	4.07	0.283	7.5
			(12.57)	
B: Number of Channels Shopped at per 10 day period				
Total channels	2.39	2.58	0.193	8.1
			(16.36)	
Channels used to buy premium products	1.74	1.77	0.030	1.7
			(3.43)	
Channels used to buy premium products conditional on buying some premium products	1.81	1.87	0.054	3.0
			(6.25)	
Channels used to buy priced products	1.88	2.07	0.192	10.2
			(17.65)	
Channels used to buy priced products conditional on buying some priced products	1.96	2.15	0.186	9.5
			(18.19)	
C: Herfindahl Index of Expenditure Shares across Channels				
All goods	0.306	0.285	-0.020	-6.6
			-(7.86)	
Premium goods	0.353	0.335	-0.018	-5.0
			-(5.91)	
Priced goods	0.302	0.286	-0.016	-5.2
			-(6.08)	

Notes: Robust t-statistics which allow standard errors to be clustered at the pseudo-level are shown in parentheses. Means and standard errors are also weighted by the number of households in a given pseudo.

TABLE 5: Mean Proportion Using Each Channel within a 10-day period by Socioeconomic Level

					Proportion Using Channel by Socioeconomic Class									
	All households				High Income - ABC1			Middle Income - C2C3			Upper Low Income - D1			Low Income - D2E		
Channel	2000	2001	2002		2001	2002		2001	2002		2001	2002		2001	2002	
Hypers	0.234	0.184	0.180		0.338	0.323		0.235	0.239		0.154	0.157		0.113	0.102	*
Supermarkets	0.512	0.465	0.452	*	0.679	0.708		0.548	0.526	*	0.401	0.399		0.371	0.362	
Discounts	0.099	0.120	0.153	*	0.148	0.176	*	0.133	0.171	*	0.125	0.156	*	0.094	0.124	*
Autoservicios	0.564	0.581	0.612	*	0.353	0.386		0.538	0.589	*	0.622	0.632		0.646	0.663	
Almacenes	0.341	0.348	0.398	*	0.129	0.164	*	0.288	0.329	*	0.416	0.456	*	0.409	0.473	*
Wholesalers	0.020	0.019	0.035	*	0.028	0.057	*	0.023	0.044	*	0.020	0.034	*	0.011	0.022	*
Kioscos	0.179	0.188	0.213	*	0.061	0.076		0.160	0.179	*	0.224	0.245	*	0.219	0.250	*
Farmacias/Perfumerias	0.107	0.101	0.125	*	0.104	0.137	*	0.108	0.136	*	0.106	0.128	*	0.085	0.108	*
Trueque	0.000	0.001	0.020	*	0.000	0.004		0.000	0.012	*	0.001	0.028	*	0.001	0.027	*
Other Channels	0.381	0.380	0.392	*	0.403	0.407		0.430	0.436		0.373	0.395	*	0.315	0.334	*
Mean number of channels	2.439	2.388	2.579	*	2.243	2.439	*	2.462	2.660	*	2.442	2.629	*	2.262	2.465	*

* denotes that the 2001 proportion is significantly different from the 2002 proportion at the 5% significance level.
Notes: Robust t-statistics which allow standard errors to be clustered at the pseudo-level are
used to calculate significance. Means and standard errors are also weighted by the number of households
in a given pseudo.

TABLE 6: QUALITY SUBSTITUTION
Mean Percentage of Monthly Expenditure within an Expenditure Category spent on Premium Brand Products

	Year		
	2000	2001	2002
A: All LatinPanel Products			
All consumers	58.2	55.2	50.0
Bottom quartile of 2000 Expenditure	55.0	51.5	46.4
Second quartile of 2000 Expenditure	57.5	54.6	49.3
Third quartile of 2000 Expenditure	58.4	55.4	50.4
Top quartile of 2000 Expenditure	62.0	59.7	55.2
B: Food Products			
All consumers	54.6	51.0	46.7
Bottom quartile of 2000 Expenditure	51.4	47.6	43.1
Second quartile of 2000 Expenditure	53.8	50.3	45.8
Third quartile of 2000 Expenditure	54.8	51.2	47.2
Top quartile of 2000 Expenditure	58.8	55.9	52.1
C: Beauty Products			
All consumers	67.6	66.7	62.3
Bottom quartile of 2000 Expenditure	65.0	62.9	59.1
Second quartile of 2000 Expenditure	66.3	65.5	61.0
Third quartile of 2000 Expenditure	68.9	67.8	63.3
Top quartile of 2000 Expenditure	70.6	70.9	67.4
D: Cleaning Products			
All consumers	71.1	68.5	57.6
Bottom quartile of 2000 Expenditure	67.0	63.3	53.3
Second quartile of 2000 Expenditure	71.5	69.1	58.1
Third quartile of 2000 Expenditure	70.9	69.0	57.5
Top quartile of 2000 Expenditure	73.9	71.3	61.3

Table 7: Determinants of Shopping Frequency 2001-02
Results using Year 2002 dummy as proxy for aggregate shock

Dependent Variable: Day Channels Shopped at per 10 day period

	(1) FE	(2) FE	(3) FE	(4) FE	(5) FE	(6) IV-FE
Year 2002 dummy	0.439	0.660	0.463	0.462	0.242	0.149
	(10.77)**	(17.29)**	(6.92)**	(6.92)**	(3.54)**	(5.22)**
Year 2002 dummy * EPH change in household labor income			-0.570	-0.599	-0.600	-0.563
			(3.91)**	(3.90)**	(3.93)**	(11.96)**
Year 2002 dummy * EPH change in household labor hours				0.002	0.002	0.002
				(0.53)	(0.49)	(1.54)
Price Dispersion					-7.170	-9.260
					(15.22)**	(25.21)**
Food CPI inflation					0.020	0.029
					(4.88)**	(8.24)**
Corralito Premium					0.006	0.015
					(1.70)	(5.58)**
Quantity of each product controlled for	no	yes	yes	yes	yes	yes
Observations	24445	24445	24445	24445	24445	24445
Adjusted R-squared	0.5996	0.7165	0.7183	0.7184	0.7249	
Number of Pseudo-households	383	383	383	383	383	383

Notes: Robust t-statistics which allow standard errors to be clustered at the pseudo-household level and weight by the number of households within a pseudo are given in parentheses.
* significant at 5%; ** significant at 1%
Quantity controls are the quantity in kilograms or litres of each of 37 separate product categories.
In column 6 price dispersion and inflation are instrumented with the depreciation and lagged depreciation rates.

Table 8: Determinants of Shopping Frequency 2001-02
Results using real average wage series as proxy for aggregate shock

Dependent Variable: Day Channels Shopped at per 10 day period

	(1) FE	(2) FE	(3) FE	(4) FE	(5) FE	(6) IV-FE
Real average monthly wage (in hundreds of pesos)	-0.218	-0.402	-0.313	-0.312	-0.212	-0.118
	(9.93)**	(18.42)**	(12.37)**	(12.36)**	(5.17)**	(3.91)**
Year 2002 dummy * EPH change in household labor income			-0.636	-0.662	-0.623	-0.638
			(6.71)**	(6.26)**	(4.77)**	(14.30)**
Year 2002 dummy * EPH change in household labor hours				0.002	0.002	0.002
				(0.49)	(0.49)	(1.59)
Price Dispersion					-3.671	-6.616
					(5.29)**	(7.29)**
Food CPI inflation					0.011	0.023
					(2.70)**	(5.14)**
Corralito Premium					0.014	0.017
					(3.65)**	(6.67)**
Quantity of each product controlled for	no	yes	yes	yes	yes	yes
Observations	24445	24445	24445	24445	24445	24445
Adjusted R-squared	0.5983	0.7231	0.7268	0.7268	0.7276	
Number of pseudo-households	383	383	383	383	383	383

Notes: Robust t-statistics which allow standard errors to be clustered at the pseudo-household level and weight by the number of households within a pseudo are given in parentheses.
* significant at 5%; ** significant at 1%
Quantity controls are the quantity in kilograms or litres of each of 37 separate product categories.
In column 6 price dispersion and inflation are instrumented with the depreciation and lagged depreciation rates.

Table 9: Determinants of Shopping Frequency 2001-02
Results using EPH income measure (months of April and September only)

Dependent Variable: Day Channels Shopped at per 10 day period

	(1) FE	(2) FE	(3) FE	(4) IV-FE	(5) FE	(6) IV-FE
EPH Log Household Labor Income	-0.811	-0.994	-0.386	-0.288	-0.102	-0.184
	(8.91)**	(11.03)**	(4.21)**	(4.55)**	(0.84)	(2.27)*
Year 2002 dummy * EPH change in household labor income					-0.741	-0.321
					(3.57)**	(2.31)*
Year 2002 dummy * EPH change in household labor hours					0.004	0.004
					(0.70)	(1.36)
Price Dispersion			-5.777	-9.681	-3.777	-8.736
			(5.07)**	(10.98)**	(3.03)**	(8.67)**
Food CPI inflation			-0.082	-0.031	-0.093	-0.037
			(6.58)**	(2.22)*	(7.02)**	(2.59)**
Corralito Premium			0.237	0.157	0.240	0.161
			(10.57)**	(6.62)**	(10.61)**	(6.75)**
Quantity of each product controlled for	no	yes	yes	yes	yes	yes
Observations	3970	3970	3970	3970	3970	3970
Adjusted R-squared	0.6410	0.7123	0.7410		0.7441	
Number of Pseudo-households ID. See notes for reference	375	375	375	375	375	375

Notes: Robust t-statistics which allow standard errors to be clustered at the pseudo-household level and weight by the number of households within a pseudo are given in parentheses.
* significant at 5%; ** significant at 1%
Quantity controls are the quantity in kilograms or litres of each of 37 separate product categories.
In columns 4 and 6 price dispersion and inflation are instrumented with the depreciation and lagged depreciation rates.

Table 10: Robustness of Income Effects to alternate measures

Row	Specification	Real average monthly wage		Year 2002 dummy * EPH change in household labor income	
		Coefficient	T-stat	Coefficient	T-stat
1	Baseline specification (Table 8, column 6)	-0.118	(3.91)**	-0.638	(14.30)**
2	Untrimmed price dispersion used	-0.178	(7.74)**	-0.604	(13.66)**
3	Price dispersion trimmed 5-95	-0.157	(6.20)**	-0.658	(14.52)**
4	Overall inflation instead of Food inflation	-0.120	(3.99)**	-0.639	(14.32)**
5	Banking holiday controls included	-0.118	(3.91)**	-0.638	(14.30)**

Note: each row after the first makes one change to the specification in Table 8 column 6
See Table 8 for details.

Table 11: Prevalence of use of different adjustment mechanisms

Adjustment Mechanism	All Pseudos	Percentage of Households 2001 Household Labor Income Quartile			
		1	2	3	4
Increase in Days	61.6	56.5	60.9	62.1	65.2
Increase in Channels	75.8	71.7	74.7	83.2	72.8
Increase in Channel-days	66.0	58.7	65.5	69.5	68.5
Increase in household labor hours	36.1	49.0	33.0	26.5	33.0

Source: own calculations from LatinPanel data and matched EPH income data

Table 12: Estimating Price Gains from Shopping more often
Dependent variable: log price

	Instrumented Channel-days		
	Coefficient	T-statistic	p-value
Baseline specification: quality*time*product effects			
no other controls	-0.045	-3.47	0.001
controls for location and household characteristics	-0.059	-4.01	0.000
pseudo-household fixed effects	-0.005	-0.34	0.733
Controlling for quality*time + product effects			
no other controls	-0.048	-3.79	0.000
controls for location and household characteristics	-0.065	-4.47	0.000
pseudo-household fixed effects	-0.027	-1.56	0.120

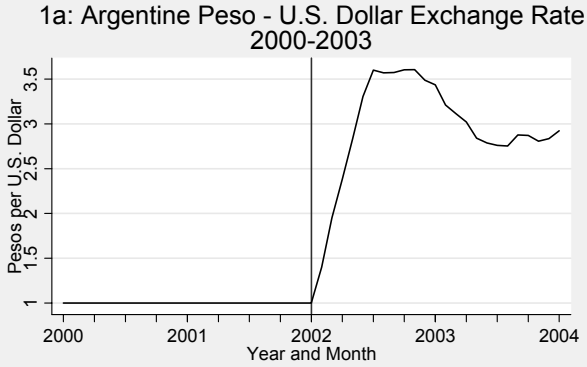
Notes: methodology described in text.
EPH income used as an instrument for channel-days.

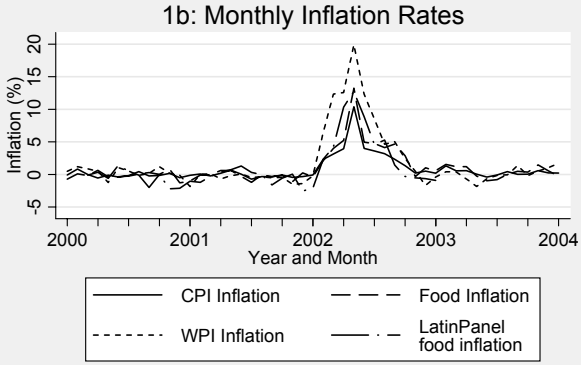
Table A1: How Much of Expenditure Does Latinpanel Capture?
Expenditure shares for Greater Buenos Aires from the 1996/97 Expenditure Survey

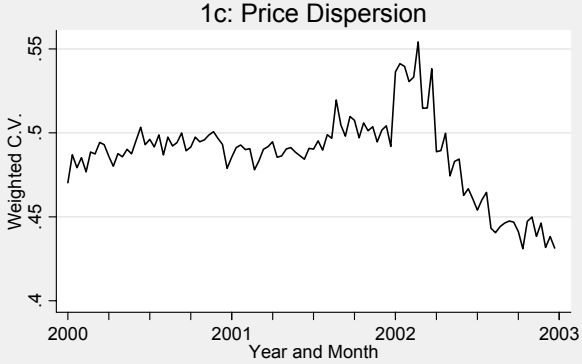
	Quintiles of Net Monthly Household Income					
Expenditure Share on Category	Lowest	2nd	3rd	4th	Highest	Total
Food and Beverages	46.2	42.2	38.0	34.2	26.1	32.9
Meat	12.1	11.2	9.5	7.8	4.8	7.4
Fruit and Vegetables	7.5	5.9	5.1	4.2	2.7	4.1
Bread	6.5	5.1	4.2	3.2	1.9	3.2
Food and Drink Consumed Outside the Home	2.2	4.1	4.6	5.7	6.8	5.6
Food items collected by Latinpanel	16.9	15.1	14.0	12.9	9.6	12.1
Clothing	3.9	5.2	5.7	5.9	6.2	5.8
Housing	12.8	14.6	15.4	13.3	11.8	13.1
Household Durables and Maintenance Expenses	5.0	4.8	5.7	6.1	8.6	6.9
Cleaning and Maintenance	2.3	2.1	2.1	1.7	1.4	1.7
Medical and Health Expenses	12.7	9.2	8.6	9.6	10.0	9.8
Transport and Communications	9.4	11.5	11.7	14.2	15.4	13.7
Leisure and Culture Expenses	3.8	5.3	6.3	7.4	11.7	8.7
Education	1.3	1.8	3.2	4.1	5.7	4.2
Beauty and Personal Care Items	2.8	3.3	3.1	3.0	2.6	2.9
Other goods and services	2.1	2.1	2.3	2.2	2.0	2.1
Latinpanel Food as Share of Total Food at Home	38.4	39.6	42.0	45.2	49.9	44.5
Latinpanel Food, Cleaning and Beauty as Share of Total Expenditure	21.9	20.5	19.2	17.6	13.7	16.7

Source: INDEC, Encuesta Nacional de Gastos de los Hogares 1996/97 Summary Tables, own calculations

Figure 1: Macro variables







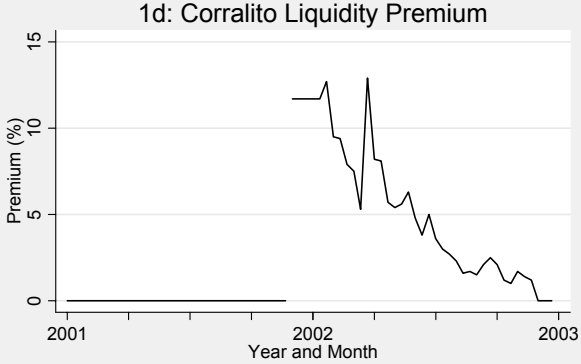
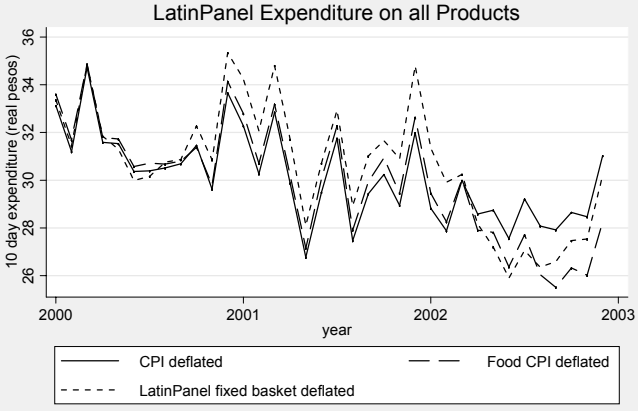
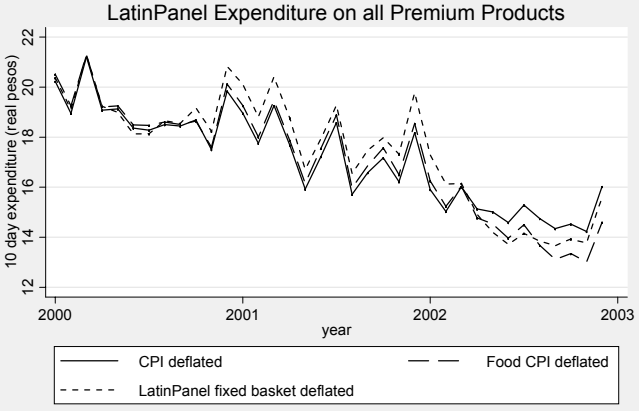


Figure 2: LatinPanel Expenditure 2000-2002





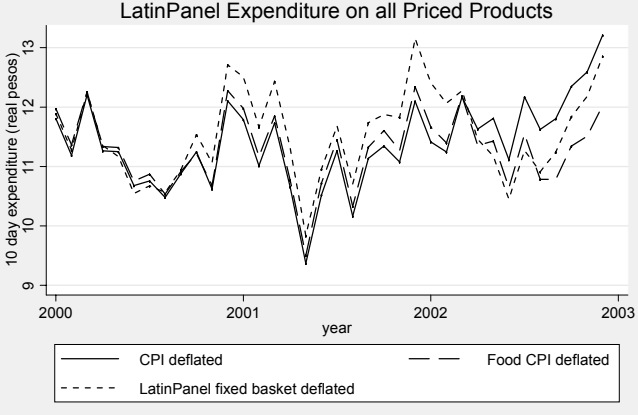


Figure 3: Mean days each household spent shopping per 10 day period 2001-2002

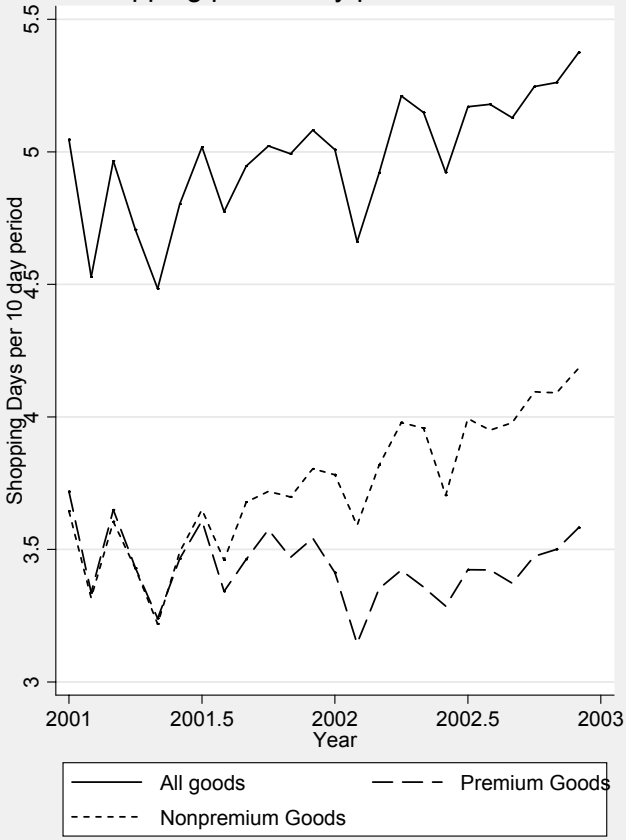
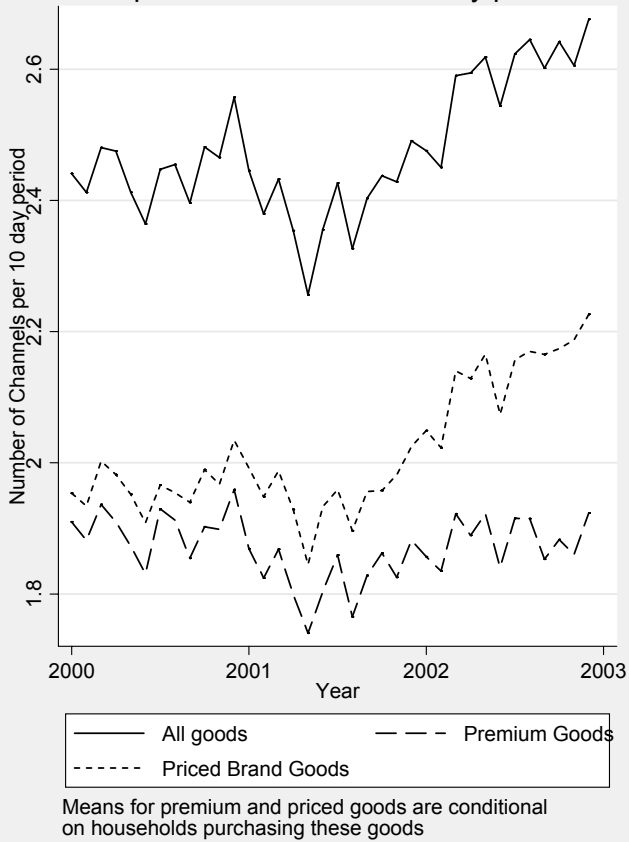
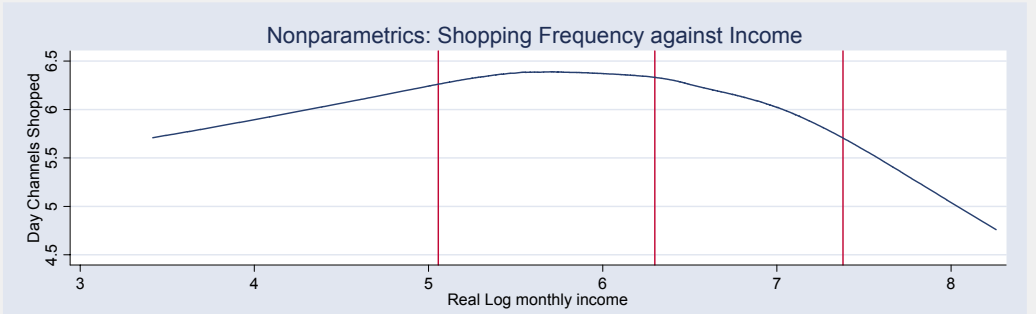


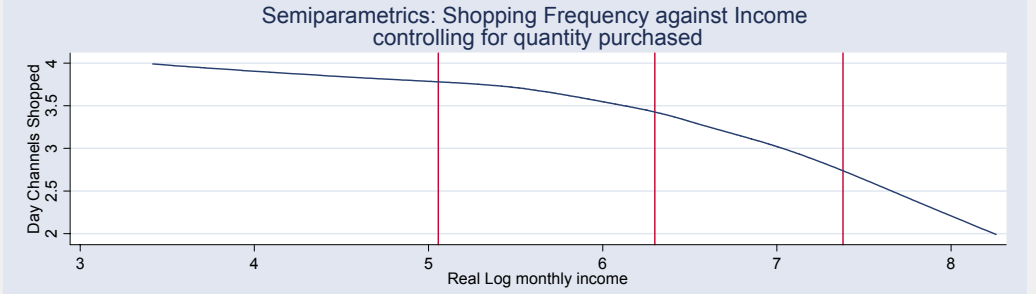
Figure 4: Mean number of channels shopped at per household each 10 day period



Means for premium and priced goods are conditional on households purchasing these goods

Figure 5: Shopping Frequency and Income





vertical lines indicate 10th, 50th, and 90th percentiles of income distribution