ESCUELA DE NEGOCIOS
Universidad Torcuato Di Tella

CIF

Centro de Investigación en Finanzas

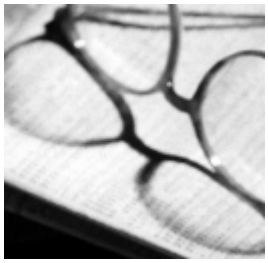
Documento de Trabajo 01/2005

Buying Less, But Shopping More: Changes In Consumption Patterns During A Crisis

David McKenzie
Stanford University

Ernesto Schargrodsky
Universidad Torcuato Di Tella






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

David McKenzie#
Stanford University

Ernesto Schargrodsky##
Universidad Torcuato Di Tella

February 11, 2005

Abstract

Market research data are utilized to examine the use of changes in shopping behavior as a method of mitigating the effects of the 2002 Argentine economic 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 a recession, 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.

Keywords: *crisis mitigation; aggregate shocks; non-market labor*

JEL classification codes: D12, J22, O12.

---

* Thanks to Sebastian Gimenez of LatinPanel for help with the market research data used in this study, to Nestor De Cesare for *corralito* expertise, to Matias Cattaneo and Sebastian Calonico for extremely valuable research assistance, and to comments from seminar participants at the Bay Area Development Day, BREAD, Di Tella, NEUDC 2004, SITE 2004, UCLA, Virginia, and Virginia Tech. Financial support was provided by a SIEPR seed grant.

Department of Economics, Stanford University, 579 Serra Mall, Stanford, CA 94305-6072; E-mail: mcken@stanford.edu; Fax: (650) 725-5702; Phone: (650) 723-9276. Part of this research was conducted while McKenzie was visiting the Poverty Research Group of the World Bank DECRG, whose hospitality is gratefully acknowledged.

Universidad Torcuato Di Tella, Miñones 2177, (1428) Buenos Aires, Argentina; E-mail: eschargr@utdt.edu; Fax: (54-11) 4783-3220; Phone: (54-11) 4783-3112.

1. Introduction

Despite missing markets and widespread market imperfections in many developing countries, households have been shown to use a wide variety of behavioral and institutional responses in order to smooth a large amount of idiosyncratic risks (Townsend, 1994, 1995). These mechanisms include, among others, income smoothing (Morduch, 1995), the use of durable assets as buffer stocks (Rosenzweig and Wolpin, 1993) and informal credit arrangements (Udry, 1994). Economic crises which affect many households simultaneously, however, 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, resulting in little smoothing of total expenditure.[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, Frankenberg, Smith and Thomas (2003) find this to be the case during the Indonesian crisis, while McKenzie (2003) shows this pattern during

[1] See, for example, Thomas et al. (1999) and Strauss et al. (2004) on Indonesia, Skoufias (2003) on Russia, McKenzie (2003) on Mexico, and Paxson and Schady (2004) on Peru.

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.

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 expenditure surveys generally provide little information on these aspects 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 household expenditure data registering all the purchases every 10-day period of a sample of products, 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 a seven percent increase in shopping frequency, with consumers shopping more days a week and at a wider variety of stores. The increase in shopping frequency occurs 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.

We examine whether the observed change in shopping frequency represents an adjustment to falling income, or the result of changes in labor hours, inflation, price dispersion, and liquidity during the crisis. Although these other factors play a role, we find evidence for a large income effect on shopping frequency, whereby poorer consumers shop more often to buy a given quantity of products. In the face of a deep recession, increasing shopping frequency allows households to use non-market labor for search activity and is found to be one of the most prevalent 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 high to low-quality 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 four percent of the cost of their food, beauty, and cleaning product expenditure, thereby mitigating up to forty 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 at changes in quantities of food consumed with retirement. We have detailed high-frequency data on shopping behavior and 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 contribute towards explaining 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 pass cost increases through 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 household expenditure data obtained from LatinPanel, a market research firm. Section 4 then details the consumer responses to the crisis in terms

of changes in expenditure, quality and shopping behavior. 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. 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 per 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 average exchange-rate from the start of 2000 through the end of 2002.[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.

Argentina's real GDP fell 10.9 percent in 2002, the largest fall since records began in 1900. 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.

[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, and how much was a result of an unfortunate sequence of external shocks, including the appreciation of the U.S. dollar during the 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 (2003), 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.

McKenzie (2004) details evidence from forecasts that the severity of the crisis was not anticipated, 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. Although experts questioned the sustainability of the convertibility plan after the failure of a last IMF-supported program in the third quarter of 2001, 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 the general public that held small deposits did not. Moreover, any attempt to offset a possible devaluation by holding dollar deposits was stymied by a forced conversion of dollar deposits into pesos.

While the earlier years of recession had been accompanied by deflation, the devaluation resulted in significant inflation. 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. Economic recovery in 2003 and 2004 was accompanied by low inflation and annual growth rates surpassing 8%.

2.1. Inflation

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. 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 (2004) 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.

Figure 1b plots monthly inflation rates from January 2000 through to December 2002. The official Consumer Price Index (CPI) and Food Price Index 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 three 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. 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.

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 at that time) 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 developed for exchanging money from one to the other at a discount. Figure 1c shows the evolution of the tri-monthly average discount for these transactions from the main domestic Buenos Aires stock exchange house.[5] 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 small durable good prizes from LatinPanel through a "mileage" loyalty program.[6]

[5] No transactions occurred between the start of the *corralito* on December 3, 2001, and January 15, 2002, due to time taken for the market to develop and the lack of transactions during banking holidays. We assume the premium during this period to be that prevailing on the first day of operations (11.7%), which accounts for the flat portion in Figure 1c. Our results are robust to dropping observations over this period.

[6] For example, in just under a year a household would have accumulated enough points for a scientific calculator, and in approximately two years they would have enough points for a baby stroller or a discman.

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, representing an average annual attrition rate of approximately 3%. The relative importance of each of these three reasons for replacement have also been stable.[7] New families that decline the invitation to be included in the sample are also randomly replaced with households of similar characteristics.[8]

Each participating 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),[9] 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);[10] 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).

Due to confidentiality 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

[7] The rotation rate is slighty higher for the households in the top socioeconomic levels. This occurs because they are more likely to voluntarily interrupt participation, although they are less likely to be 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.

[8] 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 a minor decrease from 53% in 2001 to 50% in 2002, which LatinPanel attributes to the growing reluctance in the population to receive strangers at home at a time of large increases in crime throughout the country.

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

[10] 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.

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 for each period. 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. 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.

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 twenty food products (cooking oil, cocoa powder, coffee, yerba mate & tea, dressings sauce, biscuits, breakfast cereals, pasta & noodles, soups, canned food, milks, carbonated drinks, bottled water, beers, fruit juice, frozen food, ice creams, yoghurt, butter, and margarine); ten cleaning products (dishwashing detergent, bleach, home cleaners, floor waxes, air care products, kitchen rolls, napkins, toilet paper, laundry soap, and fabric softeners); and seven 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, LatinPanel considers three quality levels: premium brands, distributor brands, and priced brands.[11] The distributor brands are private, retailer labels that account for only five percent of the value of purchases, so we will concentrate on comparing premium, high-quality to priced, low-quality products.[12] The households also report the distribution channel where they obtained each product. Eleven distribution channels are

[11] LatinPanel also sells brand data at a more disaggregated level to its corporate clients.
[12] The classification between premium and priced brands is done at the manufacturer level, i.e. all the versions of the product made by the same manufacturer are classified under the same quality category.

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.

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 use location, socioeconomic level (see Appendix 1), household size, housewife's age and youngest child's age to 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 of changes in income and labor conditions on LatinPanel outcomes.

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

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 official consumer price index and 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 share of total expenditure. 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 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 important to the poor, the LatinPanel basket also contains a number of necessity items, such as milk, pasta, soup, cooking oil, and canned food.[15] 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

[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.

[15] For supermarket sales, the share of food products covered by LatinPanel does not fall as a percentage of total food sales (which includes fresh fruit and vegetables, meat and bread). Indeed, this share increased from 67.6% in 2000 and 68.4% in 2001 to 70.3% in 2002 (Encuesta de Supermercados de INDEC, www.indec.mecon.ar).

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, and Shopping Frequency

4.1. The Change in Expenditure, Quantity and Quality

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 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.

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 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.

The change in consumption during the crisis period can also be observed by examining changes in the physical quantities of goods obtained by consumers as a result of their purchases. Table 3A details the mean 10-day quantity of each of the food products collected by LatinPanel and Table 3B reports the changes in quantities of cleaning and beauty products. While some goods show reductions in quantity during 2001, there are much larger reductions in 2002. Eleven of the 20 food 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.[16] Households reduced the quantity of all cleaning and beauty products, with 11 of the 17 products showing declines of over 10 percent.

Table 4 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 for each year. Overall, consumers reduced the expenditure share on premium brand products by 5 percentage points in 2002 (from 55.2% to 50.0%).[17] Similar reductions were seen for each quartile of expenditure, suggesting that quality substitution was not just something

[16] 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.

[17] Burstein, Eichenbaum, and Rebelo (2004) find similar results using supermarket scanner data. Our demand-side LatinPanel dataset also measures quality substitution across channels.

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.[18]

An alternative data source provides further evidence on the adjustment of household consumption as response to the crisis. Table 5 presents our own calculations based on the World Bank's Socioeconomic Impact of the Argentine Crisis survey (*Impacto Social de la Crisis en la Argentina (ISCA)*).[19] The survey directly asked households whether they had used or not a variety of coping strategies during the reference period. The table shows that a large percentage of households reduced the quantity of food consumed, substituted towards cheaper food, carried out more home production, and made other adjustments in consumption. Moreover, these adjustments in consumption not only took place during the most tumultuous phase of the crisis in the first part of 2002, but also continued throughout the rest of the year. Approximately the same percentage of households made these changes between June 2002 and November 2002 as the percentage of households making adjustments between October 2001 and June 2002.

4.2. The 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 these 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 6 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

[18] 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.
[19] Data available online at the World Bank's Argentina website: www.bancomundial.org.ar. See Fiszbein, Giovagnoli and Adúriz (2002) for details.

when we condition on individuals buying some premium products, so does not simply reflect people stopping shopping for these products altogether.

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 6 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 shopping days and the number of channels shopped at 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 9.5% between 2001 and 2002. It cannot either be explained by an increase in the variety of products. CCR (2003) reports a reduction in the number of SKUs offered in supermarkets of 14.3% between 2001 and 2002.[20] Moreover, the measured increase in the number of stores is not induced by tiny purchases at new channels. Panel C of Table 6 shows a reduction in Herfindahl indexes of expenditure shares across channels, indicating less concentration amongst channels in the value of expenditure.

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

[20] Shortages cannot explain these findings either. The products that disappeared from the market were high-quality, premium goods (mainly imports), whereas shopping days and the number of channels increased for priced goods.

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 on the same day. For example, consumers may now shop at two supermarkets instead of one. If this occurs on different days we will capture it as separate transactions, but will only measure it as one transaction if it occurs on the same day.

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. Panel D of Table 6 shows that on average each pseudo-household spent 6.28 channel-days shopping each 10-day period in 2001, which increased to 6.71 in 2002, a seven percent increase in shopping frequency.

Panel E of Table 6 reports the average number of transactions made by households per product each 10-day period in 2001 and 2002. A transaction for a given product is measured as a channel-day in which that particular product was purchased. For example, if a household purchased milk and tea at the supermarket today, coffee at the hypermarket today, and milk at the supermarket again tomorrow, this would represent three channel-days shopping, with two transactions for milk, one transaction for tea, and one transaction for coffee. Households are seen to have *reduced* the average number of transactions made per product, with more of a decrease for beauty and cleaning products than for food. This shows that the increase in shopping frequency is a result of households buying their basket of goods over more days and channels, rather than due to them increasing the number of transactions for each individual item in their basket.

To examine further which channels account for this increase in total channel use, Table 7 reports the proportion of buyers using each channel. The increase in the number of channels used is seen to arise from an increase in use of down-the-trade channels such as self-services (*autoservicios*), grocery stores (*almacenes*), candy stores (*kioscos*), and discount stores. 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 barter clubs (*trueque*) 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.

5. Explaining the Increase in Shopping Frequency

5.1. The Income Level Effect

A first potential explanation for the increase in shopping frequency observed during 2002 is that it reflects an income effect. As real incomes fell with the crisis, consumption decreased. Assuming a decreasing marginal utility of consumption, consumers may now be expected to substitute leisure time for consumption by increasing shopping search in order to extract more consumption from a given amount of 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". When income is low, 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.[21] 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, leading to less shopping frequency. For the top half of 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[22] method for two-step estimation of the following partial linear model:

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

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 (the number of channel-days shopped per 10-day period) 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

[21] The Epanechnikov kernel was used with a bandwidth of approximately one-half of the observations.
[22] We use a differencing order of five.

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.

In order to estimate the effect of income on shopping frequency during the crisis, we run the following model:

$$Shopping\ Freq_{h,t} = \alpha \log income_{h,t} + \gamma Z_t + \delta X_{h,t} + \sum_{j=1}^{37} \beta_j q_{j,h} + \mu_h + \varepsilon_{h,t} \qquad (2)$$

where, for pseudo h in period t, $Shopping\ Freq_{h,t}$ is the number of channel-days shopped at (divided by the number of households in the pseudo), log $income_{h,t}$ are alternative income measures that can vary by time or by time and pseudo, Z_t alternatively represents aggregate controls that only vary by time or time effects, $X_{h,t}$ are controls that vary by time and pseudo, $q_{j,h}$ is the quantity of product j purchased by pseudo h, and μ_h are pseudo-household fixed effects. We will cluster the standard errors to allow for arbitrary correlation of the error terms $\varepsilon_{h,t}$ at the pseudo-household level.

As noted, LatinPanel does not collect income data, and so in our panel analysis we employ additional data sources to measure income. In Panel A of Table 8 we use the log 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 in the formal economy. Column 1 of Table 8.A first shows the effect of income on shopping frequency after controlling for pseudo-household fixed effects, but without any other controls. Column 2 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 disadvantages of this income measure are that it does not vary across households, and so is identified only from aggregate variation, and that it does not capture labor income changes outside of formal employment. The labor force survey (EPH) is then used to obtain a measure of the mean change in log household labor income experienced by each pseudo-household between 2001 and 2002, in order to determine whether households which experienced more of a fall in income increased their shopping frequency most. Averaging income in this manner enables us to use the full time series of observations in our regressions, providing more power in detecting the effects of other variables which vary only over time. Column 3 of Table 8.A then adds the fall in labor income between 2001 and 2002 experienced by each pseudo-household and shows that pseudo-households whose labor income fell by more during the crisis were the ones who increased shopping frequency the most. The results confirm the negative effect of income on shopping frequency found in the cross-section. Based on column 2, one estimates that the 0.17 fall in log aggregate wages is associated with consumers shopping 0.59 more channel-days per 10-day period, while based on column 3, the joint effect of the fall in log aggregate wages and 0.34 fall in EPH wages is a 0.67 channel-day increase in shopping frequency.

As an alternative, in Panel B of Table 8 we use the log household labor income for each pseudo-household for the months of the labor force survey, thereby restricting our analysis to the months of April and September of each year. Again, column 1 of Table 8.B first shows the effect of income on shopping frequency after controlling for pseudo-household fixed effects, but without any other controls, and then column 2 adds controls for the quantity of each product purchased. We again find a strong negative effect of income on shopping frequency. The 0.34 fall in EPH log household labor income between 2001 and 2002 is associated with an increase of 0.34 channel-days per 10-day period.

5.2. Other Potential 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 forced availability of extra-time generated by unemployment, the liquidity restrictions for consumers as a result of the *corralito*, the effect of inflation, and the effect of changes in price dispersion. We control for these factors in Table 9, after repeating in each panel the last regression of Table 8.

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. Thus, unemployment and underemployment could have affected the availability of shopping time, in addition to their income effect. We therefore control for changes in household labor hours in our regressions to capture these effects.

A second factor is that 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 control for the strength of the liquidity restrictions 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, 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 INDEC 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. In particular, inflation results in the ranking of prices across stores changing from period to period. 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. Tommasi (1994) also

provides evidence for this. Using weekly prices from Buenos Aires supermarkets for 1990-91, he finds that the forecast error in predicting future prices from current prices was higher during periods of higher inflation. 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.

We follow Van Hoomissen (1988) in measuring price dispersion as the interstore price variability from month to month. We calculate the LatinPanel inflation rate $I_{c,j,q,t}$ for a given product j of quality q between month t and month t-1 in each channel c, and then take the standard deviation of these inflation rates across channels to obtain a measure of price variability $V_{j,q,t}$ for each product, quality and month. The aggregate share of expenditure in 2000 on each product is then used to weight the individual product-quality price variabilities in order to obtain an aggregate measure of price dispersion. This price dispersion measure rises during the first part of 2002 following the depreciation, and falls again later in the year.

Column 2 of Panels A and B of Table 9 then examines the effect of controlling for the labor hours, *corralito*, inflation, and price dispersion as additional determinants of shopping frequency. Adding these controls to Panel A does not have any significant impact on the coefficients of the income variables. Shopping frequency is still found to have increased as aggregate income fell, and to have increased by more for the households whose incomes fell most during the crisis. The magnitude of the labor income coefficient falls somewhat in Panel B when we restrict the analysis to only the months of the EPH, but still shows a sizeable and significant negative effect of income on shopping frequency.

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 and

changes in labor hours on labor income, there is no additional effect of the changes in the time spent at work on shopping frequency.

The *corralito* premium is found to have a significant positive impact on shopping frequency, so that consumers shop more often when there is less liquidity. However, the magnitude of the estimated effect is small when the full set of months is used for estimation: according to Panel A of Table 9 a one standard deviation increase (4 percent) in the *corralito* premium is associated with only a 0.04 increase in channel-days. The estimated effect is larger in Panel B, but since is estimated from only two months each year, it appears to be picking up mainly the large increase in shopping frequency between 2001, when there was no *corralito*, and 2002. The coefficients on price dispersion and inflation are unstable in terms of sign and significance across the two Panels.

The finding that the income effect remains highly significant after the introduction of the liquidity, inflation, and price dispersion controls should not be surprising. Our LatinPanel data shows that households continued to increase their shopping frequency in the second half of 2002 (see Figures 3 and 4), even though the exchange rate and inflation had stabilized and the *corralito* was becoming less binding. In contrast, real income continued to fall throughout most of the second half of 2002, requiring further adjustment in expenditure. In accordance with our LatinPanel results, the World Bank survey results presented in Table 5 suggest that households did indeed make *further* adjustments to consumption in the second half of 2002. Although this survey does not ask directly about shopping frequency, it shows, for example, that more than 60% of households report increases in time dedicated to doing housework for both periods considered. Thus, the continuation of changes in shopping behavior throughout 2002 seems robust to alternative data sources.

Still, a potential concern with our results is that there may be other aggregate shocks in the economy arising from the crisis which are correlated with both income and shopping frequency. Therefore in Column 3 of both panels of Table 9 we introduce time effects, which will capture the impact of the *corralito*, inflation, price dispersion, and any other

aggregate effects. The impact of changes in labor income is then only identified from differences in the changes in these variables across households. The coefficient on the change in income in Panel A does not change significantly after adding time effects, and still shows that households whose incomes fell by more increased their shopping frequency by more. In the second panel, where we were not controlling separately for aggregate income, the magnitude of the coefficient on labor income falls after introducing time effects. This suggests that the aggregate component in labor income was also picking up the effects of other macro-shocks on shopping frequency. Nevertheless, one still finds a significant negative effect of income on shopping frequency.

Although the addition of time effects captures any aggregate influence on shopping frequency, it may still be the case that the *corralito*, inflation, and price dispersion had different impacts on different households. We therefore examine the robustness of our results to adding pseudo-specific measures of these controls.

As during the *corralito*, money within the financial system could be used to buy items from stores that accepted credit cards, we interact the percentage of households in a pseudo owning a credit card prior to the crisis (provided by LatinPanel) with the *corralito* premium in order to allow the liquidity restrictions to differ across households.

In order to construct a pseudo-specific inflation measure, we use the expenditure shares in the year 2000 of each pseudo on each product as weights to multiply the inflation rates of each individual item in the official Food Price Index (see http://www.indec.gov.ar). This allows a pseudo-household which tended to consume more of a particular product pre-crisis to be affected more by price increases in that product. Similarly, we use the expenditure shares in the year 2000 of different pseudos on each product and quality (instead of the mean shares across all pseudos) as weights on our Van Hoomissen (1988) measures of interstore price variability in calculating pseudo-specific price dispersion. This allows a pseudo-household which tended to consume more of a particular item pre-crisis to be affected more by price variability in that item.

Note that although the *aggregate* inflation and price dispersion considered above may be endogenous to shopping frequency if consumers shopping more affects the prices set by retailers, after controlling for aggregate time effects our pseudo-level measures will not suffer from this problem under the assumption that each individual pseudo-household has a negligible effect on the price of a product. This assumption appears reasonable given the large number of pseudos and the fact that no single pseudo makes up a substantial part of the market for any one product.

The coefficient on the change in log income proves extremely robust to the inclusion of all of these pseudo-specific controls in the last column of both panels of Table 9. None of the coefficients on the control variables are statistically significant. The income coefficient is larger in the first panel, although we cannot reject the equality of the income coefficients in Panels A and B at any standard significance level. Based on Column 4 of Table 9.A, which uses the largest number of observations, we estimate that the 0.34 average fall in log household labor income resulted in a 0.21 increase in channel-days shopped per 10-day period to purchase a given quantity. Comparing this to the 0.43 increase in channel-days seen in Table 6, we see that the fall in income accounts for approximately one half of the increase in shopping frequency during the crisis.

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 10 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. 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 (2002). They find that only 15 percent of households said that as a response to the crisis 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. In comparison, Table 5 showed 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 83 percent purchasing non-food goods of a lower quality brand. 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 possible 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.[23]

An alternative explanation is that the increase in shopping frequency is a result of liquidity constraints which prevent consumers from buying many items at the same time. In addition to the direct effect of the corralito on liquidity, it may be that households which suffered a fall in income also became more liquidity constrained, so that some of the income effect on shopping frequency also reflects liquidity. If this is the case, in contrast to the search rationale for shopping more, we would expect to find that shopping more due to liquidity constraints results in consumers paying higher prices. Similarly, if the need to avoid the inflationary erosion of money holdings or the increase in transportation costs drives the rise in shopping frequency, we should expect an association between increased shopping and higher prices.

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

[23] Petrol prices increased 82 percent while public transport prices remained fixed in nominal terms and real wages fell, so shopping by car became relatively more expensive compared to more time-consuming methods of transport or to walking. To the extent that consumers reduced expenses by switching from driving to supermarkets to going to stores by public transport or walking, we will underestimate the savings from the change in shopping patterns.

$$\ln\left(price_{i,q,t,h}\right) = \gamma_{i,q,t} + \beta\, ChannelDays_{t,h} + \lambda X_h + \varepsilon_{i,q,t,h} \qquad (3)$$

The fixed effects $\gamma_{i,q,t}$ capture the effect of inflation, allowing this to differ by product and quality. The term X_h captures household characteristics such as location of residence, household size, and demographic variables, which may be related to both the price paid by a pseudo-household on average and its shopping frequency. In carrying out this estimation, we weight equation (3) 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. Since there are multiple observations per pseudo-household in each period (one observation on each product and quality combination) we cluster the standard errors to allow for arbitrary correlation of the error terms within a time period for each pseudo-household.

As discussed in the previous section, there are a number of reasons for the increase in channel-days observed during the crisis, with only part of the effect due to the fall in income. Inflation and price dispersion could also have an effect on shopping frequency. As a result, shopping frequency is likely to be endogenous to prices in equation (3). We therefore isolate the effect of the increase in shopping frequency due to lower income on prices paid by using column (4) of Panel B of Table 9 to instrument channel-days.[24] Since we wish to examine the effect on prices of increasing the number of channel-days used to buy a given quantity of goods, we hold quantity constant in constructing the fitted values from Table 9.

Table 11 then presents the resulting estimates of β in equation (3) under several different specifications of controls. 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. The first three columns contain quality*time*product effects $\gamma_{i,q,t}$ and thereby

[24] The variation used to identify the impact of changes in shopping frequency on prices comes from changes in relative income across pseudos. We use panel B rather than panel A of Table 9, as the use of levels rather than annual changes in income provides more variation with which to identify β. Similar, but less precise, results are used using panel A.

isolate the impact of shopping more for the same products and qualities on prices. The results show a strong negative effect of shopping frequency on prices, which becomes larger in magnitude once one controls for household characteristics in Columns 2 and 3. One more channel-day of shopping is estimated to result in a 4 percent saving in prices without controlling for household characteristics, and 17-18 percent saving in prices after controlling for household characteristics. Controlling for household characteristics takes account of the fact that larger households shop less often to buy a given quantity, since they buy more each time, and that larger households also pay lower prices, due to a quantity discount. The result is that not controlling for household characteristics understates the price gains from shopping more frequently.

Columns 4 through 6 replace $\gamma_{i,q,t}$ with product*time effects. This allows us to also capture any reduction in prices resulting from switching to lower-quality goods when consumers shop more often. Shopping at a wider variety of stores may provide consumers with more choice over brands, and allow them to 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 coefficients are always larger in magnitude than their counterparts in columns (1)-(3) and comparing the coefficients suggests that consumers save an additional 1.6-2.0 percent in prices by switching qualities.

An alternative method of determining whether consumers switch to lower quality items by shopping more can be obtained by regressing the percentage share of priced goods for product i purchased at time t by pseudo-household h on shopping frequency and household fixed effects:

$$PricedShare_{i,t,h} = \theta\, ChannelDays_{t,h} + \pi_h + \nu_{i,t,h} \qquad (4)$$

As for equation (3), we instrument channel-days with EPH income holding quantity fixed. 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. This is almost exactly the estimate obtained by comparing the coefficients in columns (3) and (6) of Table 11.

Combining the above results, we have that shopping one more channel-day is associated with a 17-18 percent fall in the price paid for the same products, along with a 2 percent saving from switching to cheaper brands. Recall that the crisis resulted in a 0.34 fall in log household labor income, which based on the coefficient on log labor income in column 4 of Table 9.A is estimated to have increased channel-days by 0.21 channel-days per 10-day period. Therefore the estimated average savings to consumers from the increase in shopping frequency during the crisis in response to falling income is a 4 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 40 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.

Although inflation, price dispersion, and illiquidity effects of the *corralito* could have played a role in accounting for the changes observed in shopping behavior, our analysis suggests that the fall in income experienced by consumers during the crisis was the prime

determinant of the increase in shopping frequency. 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 4 percent of the cost of their food, beauty and cleaning products by increasing shopping frequency, allowing them to mitigate up to 40 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 implications for the measurement of the impact of economic shocks. Reductions in leisure time to increase consumption may have non-negligible welfare effects (see Krueger and Perri, 2003). Morever, 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. On the other hand, 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.

Appendix 1: Classification of Household Socioeconomic Levels

Following the methodology of the Argentine Marketing Association (1998), LatinPanel classifies households by socioeconomic level 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).[25] 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.

[25] For the assignment of points for each concept and further details, see Argentine Marketing Association (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

Argentine Marketing Association (1998), "Indice de Nivel Socio Económico Argentino".

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) "Large devaluations and the real exchange rate", mimeo, Department of Economics, UCLA.

Calvo, Guillermo, Alejandro Izquierdo, and Ernesto Talvi (2003) "Sudden Stops, the Real Exchange Rate and Fiscal Sustainability: Argentina's Lessons." NBER Working Paper No. w9828.

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.

CCR (2003) "Evolución de la cantidad de SKUs vendidos antes y después de la devaluación en las cadenas de Hipermercados, Supermercados y Hard Discounts en la Argentina".

De la Torre, Augusto, Eduardo Levy Yeyati and Sergio L. Schmukler (2003) "Living and Dying with Hard Pegs: The Rise and Fall of Argentina´s Currency Board." *Economía* 3(2): 43-107.

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 (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.

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 (2003) "Great Expectations and Hard Times: The Argentine Convertibility Plan." *Economía* 3(2): 109-160.

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. 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.

Krueger, Dirk, and Fabrizio Perri (2003) "On the Welfare Consequences of the Increase in Inequality in the United States", mimeo, Stanford University.

LatinFocus (2002) "LatinFocus Consensus Forecast: January 2002". Barcelona: LatinFocus; available at http://www.latin-focus.com (accessed March 28, 2003).

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.

Morduch, Jonathan (1995) "Income Smoothing and Consumption Smoothing", *Journal of Economic Perspectives* 9(3): 103-114.

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.

Paxson, Christina and Norbert Schady (2004) "Child Health and Economic Crisis in Peru", mimeo, The World Bank.

Rosenzweig, Mark R. and Kenneth Wolpin (1993) "Credit Market Constraints, Consumption Smoothing and the accumulation of durable production assets in low income countries: Investments in bullocks in India", *Journal of Political Economy* 101(2): 223-44.

Skoufias, Emmanuel (2003) "Consumption Smoothing in Russia: Evidence from the RLMS", *Economics of Transition* 11(1): 67-91.

Strauss, John, Kathleen Beegle, Yulia Herawati, Agus Dwiyanto, Daan Pattinasarany, Elan Satriawan, Bondan Sikoki, Sukamdi, Firman Witoelar (2004) *Indonesian Living Standards Before and After the Financial Crisis: Evidence from the Indonesia Family Life Survey*. RAND: Santa Monica.

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 (1994) "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.

Townsend, Robert M. (1994) "Risk and insurance in village India", *Econometrica* 62: 539-91.

Townsend, Robert M. (1995) "Consumption insurance: An evaluation of risk-bearing systems in low-income countries", *Journal of Economic Perspectives* 9(3): 83-102.

Udry, Christopher (1994) "Risk and insurance in a rural credit market: An empirical investigation", *Review of Economic Studies* 61(3): 495-526.

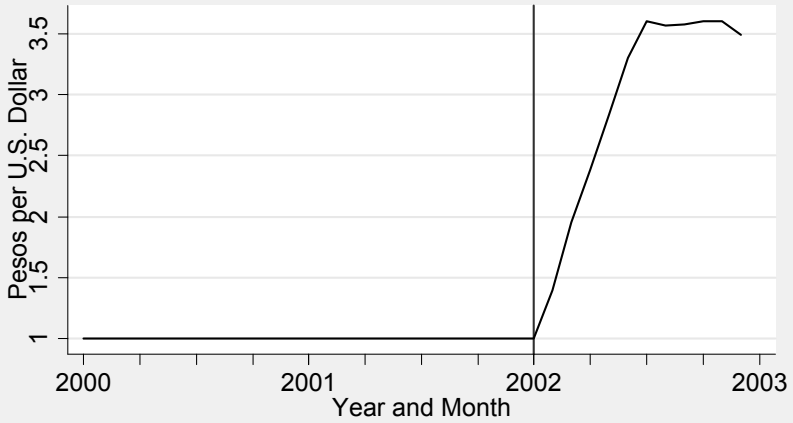
Van Hoomissen, Theresa (1988) "Price dispersion and inflation: Evidence from Israel", *Journal of Political Economy* 96(6): 1303-1314.

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.

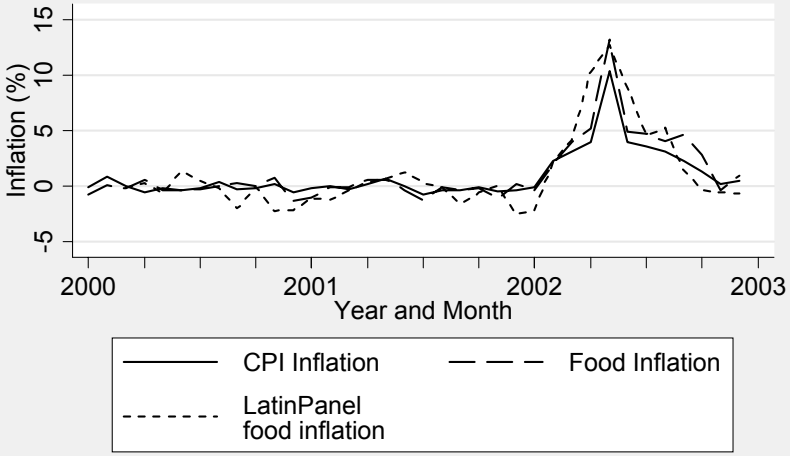
Yatchew, Adonis (1997) "An elementary estimator of the partial linear model", *Economics Letters* 57: 135-143.

Figure 1: Macroeconomic variables

1a: Argentine Peso - U.S. Dollar Exchange Rate 2000-2002



1b: Monthly Inflation Rates



1c: Corralito Liquidity Premium

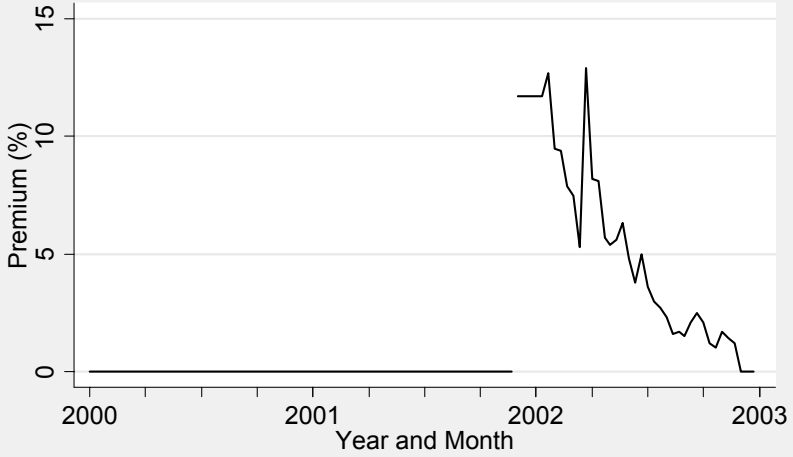
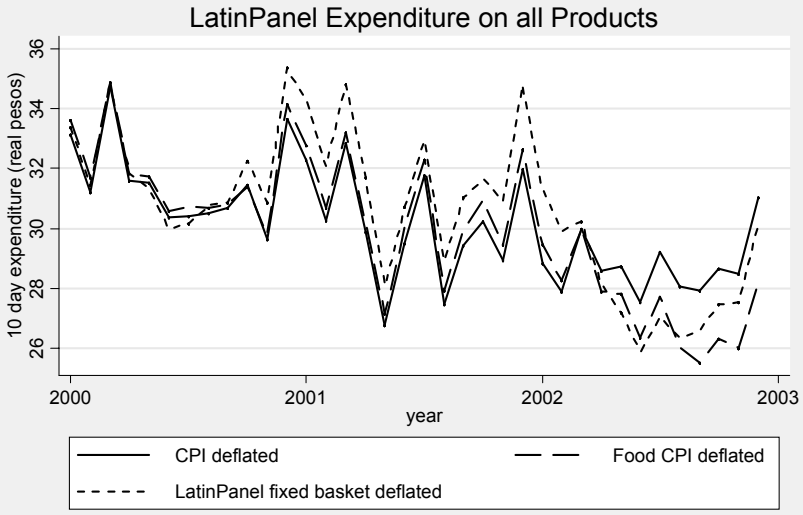
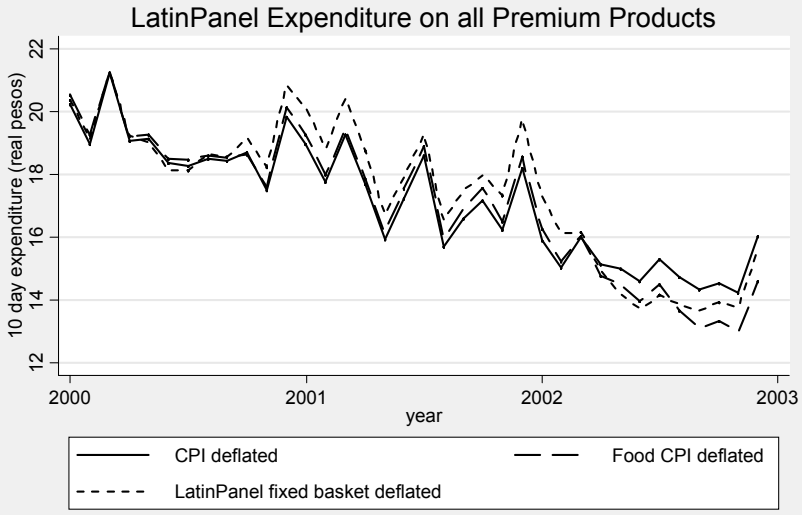


Figure 2: LatinPanel Expenditure 2000-2002





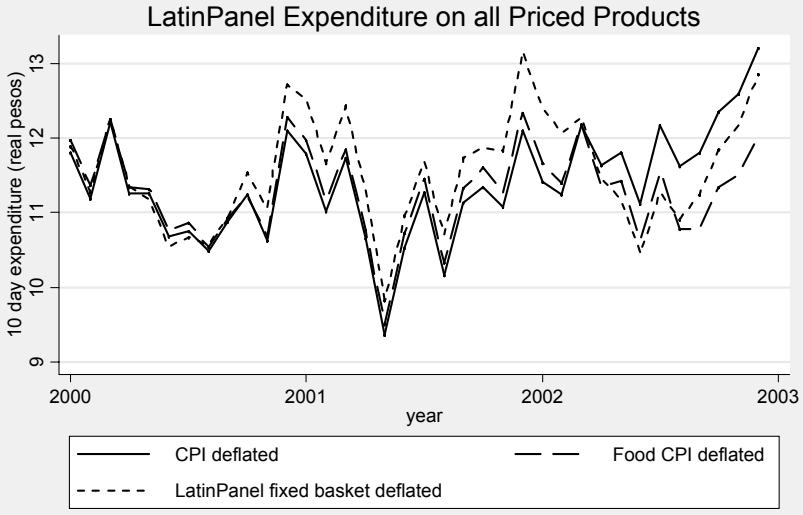


Figure 3: Mean days each household spent shopping per 10 day period 2001-2002

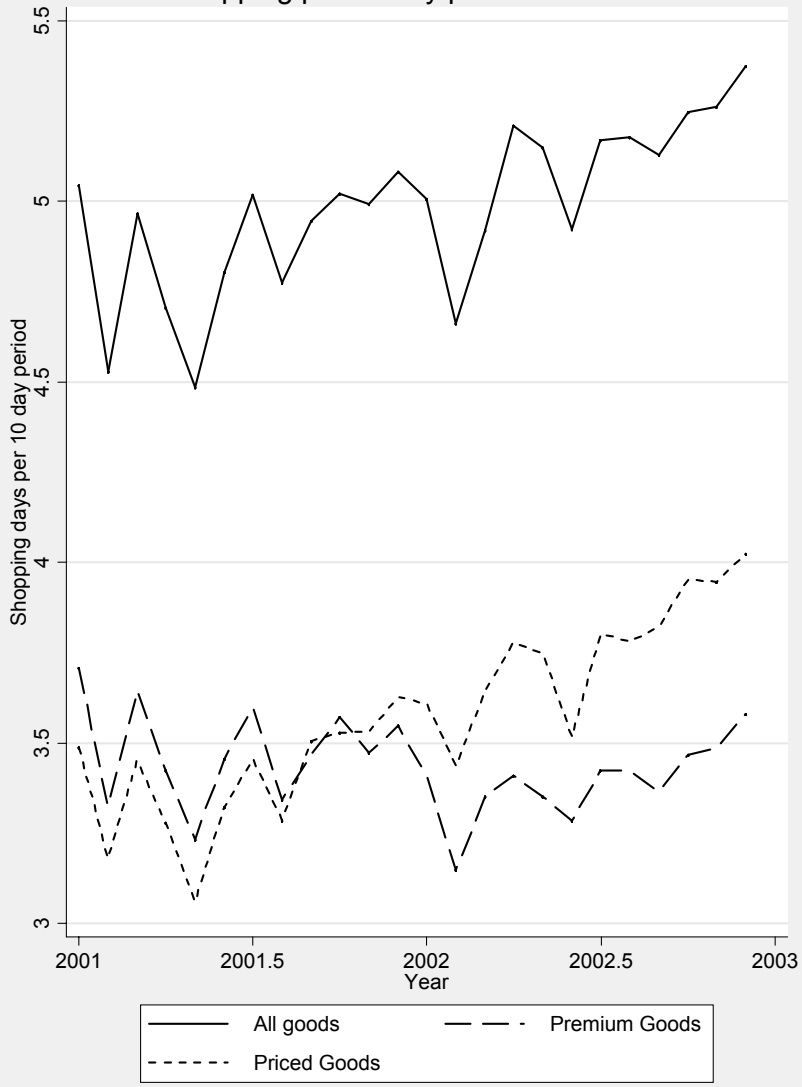


Figure 4: Mean number of channels shopped at per household each 10 day period

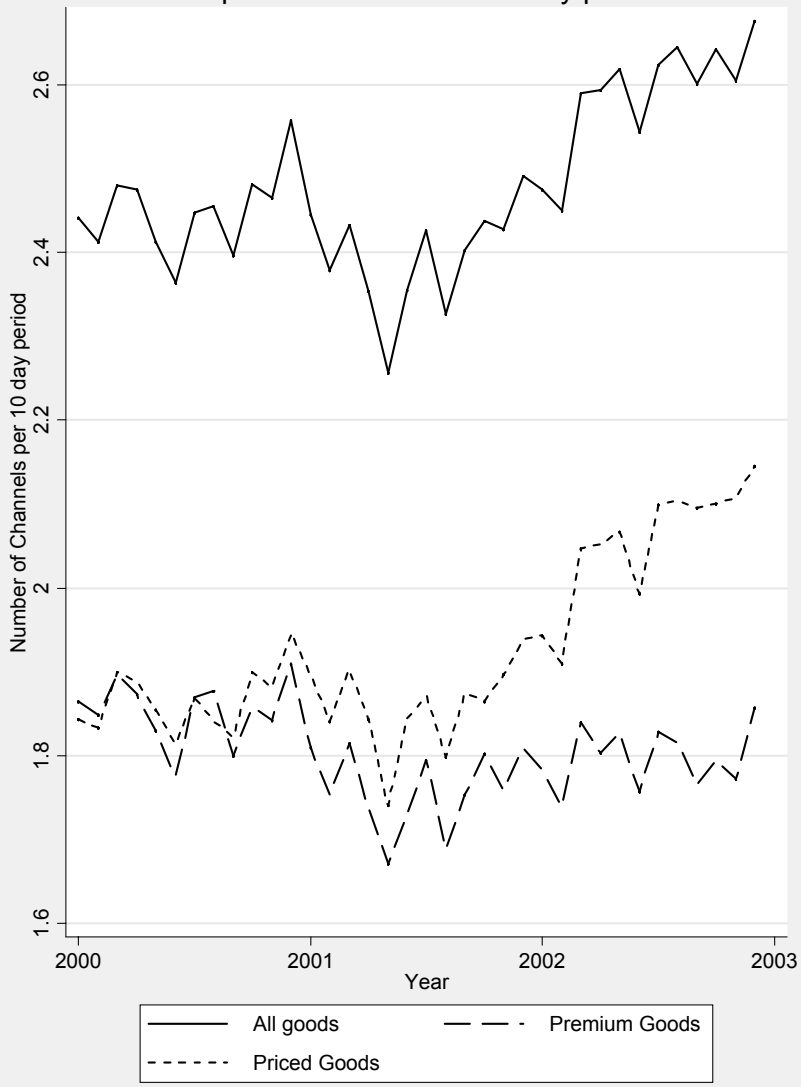
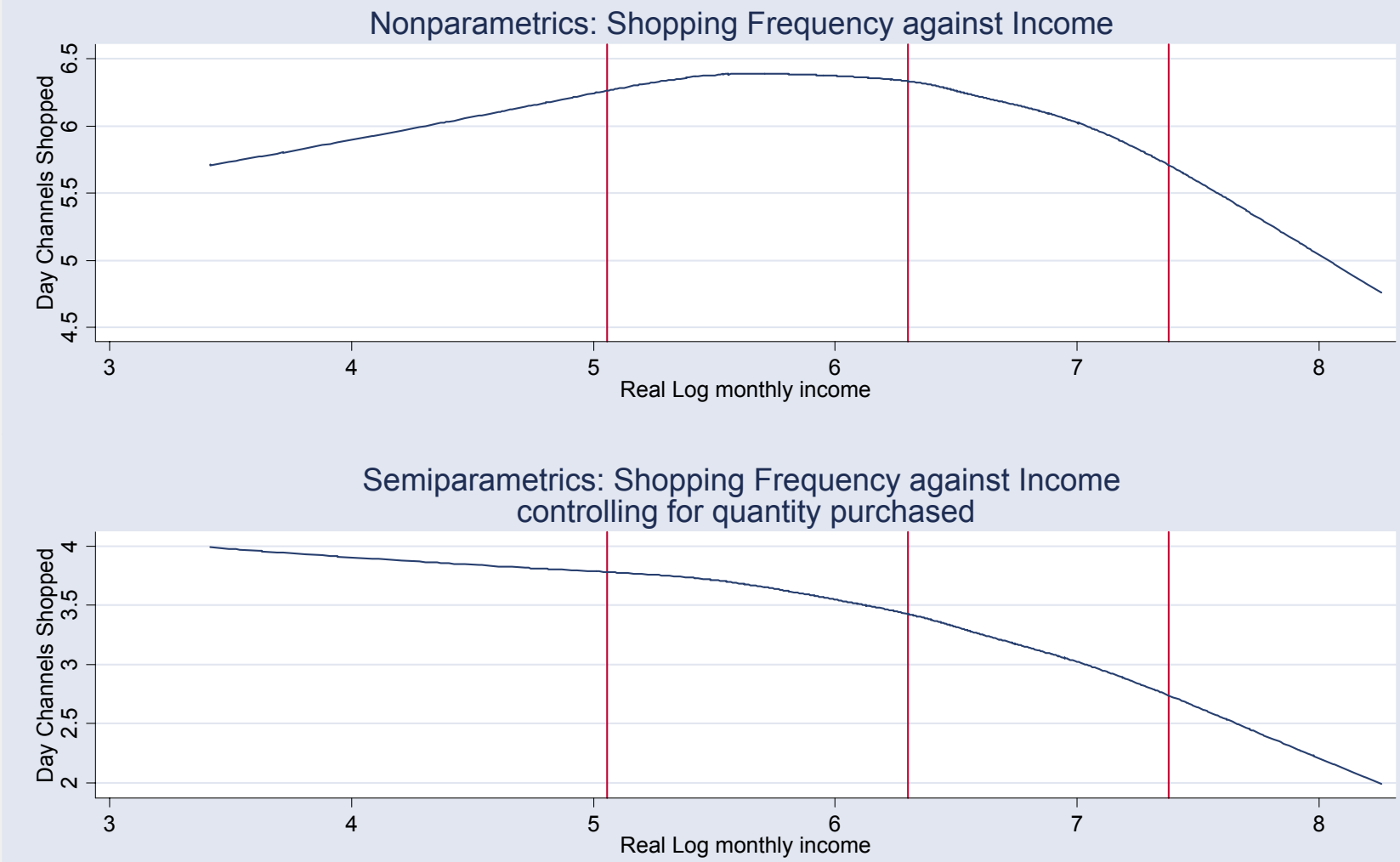


Figure 5: Shopping Frequency and Income



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

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
Basic Food Basket (GBA)	h	-7.5	-3.3	-3.7	74.9	0.0
Wholesale Price Index	i	1.2	2.4	-5.3	118.0	2.0
Producer Price Index	i	1.1	2.3	-5.6	124.9	1.9
Wholesale Price of Imported Products	i	-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: INDEC, Annual inflation for Greater Buenos Aires (GBA), December to December, 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, Annual inflation for Greater Buenos Aires (GBA) on Basic Food Basket used to calculate the indigence line, December to December for 2000-2003, September to September for 1999-2000, www.indec.mecon.ar [Feb 16, 2004]
i: 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

Expenditure Category	Mean			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 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 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 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. Real values are expressed in terms of 2001 pesos.
* and ** indicate significantly different from zero at the 5% and 1% levels.

TABLE 3A: CHANGE IN QUANTITIES OF FOOD PRODUCTS 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	*
Ice Cream	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	

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

TABLE 3B: CHANGE IN QUANTITIES OF CLEANING AND BEAUTY PRODUCTS PURCHASED

		Mean 10-day quantity						
Item	**Units**	**2000**	**2001**	**2002**	**2000-01**		**2001-02**	
Cleaning Products								
Dishwashing detergent	Lt	0.287	0.305	0.299	6.3	*	-2.1	
Bleach	Lt	0.521	0.562	0.545	7.8	*	-2.9	*
Home cleaners	Lt	0.224	0.242	0.216	7.8	*	-10.9	*
Floor waxes	Lt	0.045	0.039	0.027	-14.6	*	-29.7	*
Air care products	Lt	0.098	0.103	0.076	5.6	*	-26.7	*
Kitchen rolls	units	0.662	0.777	0.696	17.4	*	-10.5	*
Napkins	units	7.534	6.498	4.884	-13.7	*	-24.8	*
Toilet paper	units	3.260	3.418	3.266	4.9	*	-4.5	*
Laundry powder	Kg	0.542	0.523	0.452	-3.4	*	-13.6	*
Fabric softener	Lt	0.232	0.225	0.166	-2.8		-26.2	*
Beauty Products								
Soap	Kg	0.114	0.110	0.098	-3.3	*	-10.8	*
Deodorant	Lt	0.273	0.253	0.205	-7.5	*	-19.0	*
Toothpaste	Kg	0.028	0.027	0.024	-4.3	*	-10.6	*
Shampoo	Lt	0.143	0.138	0.135	-3.5	*	-2.2	
Conditioner	Lt	0.098	0.096	0.089	-2.2		-7.2	*
Hair coloring	units	0.049	0.046	0.043	-6.9	*	-5.0	
Feminine protection	units	5.698	5.603	4.930	-1.7		-12.0	*

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

TABLE 4: QUALITY SUBSTITUTION
Mean Percentage of Monthly Expenditure spent on Premium Brand Products

	Year		
	2000	2001	2002
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

TABLE 5: WORLD BANK SURVEY ON CONSUMPTION COPING STRATEGIES

	Percent of households using method in:	
	June 2002 compared	November 2002 compared
Method	to October 2001 levels	to June 2002 levels
Reduced quantity of food	75.3	70.3
Substituted for cheaper food	92.3	89.5
More home production for own consumption	60.4	62.3
Substituted non-food items for cheaper items	83.4	82.8
Have stopped buying some non-food items	79.9	80.0
Reduced frequency of clothing purchases	88.6	87.2
Have started buying second-hand items	35.1	28.6

Notes: Results for matched panel of urban households surveyed in June and November 2002.
Source: own calculations from World Bank ISCA survey

TABLE 6: CHANGE IN SHOPPING FREQUENCY 2001-2002

Dependent Variable	Mean of the dependent variable		%
	2001	2002	change
A: Days Shopping per 10-day period			
Total days spent shopping	5.03	5.21	3.7**
Days shopping for premium products	3.47	3.35	-3.4**
Days shopping for premium products conditional on buying some premium products	3.61	3.53	-2.3**
Days shopping for priced products	3.63	3.93	8.2**
Days shopping for priced products conditional on buying some priced products	3.79	4.07	7.5**
B: Number of Channels Shopped at per 10-day period			
Total channels	2.39	2.58	8.1**
Channels used to buy premium products	1.74	1.77	1.7**
Channels used to buy priced products	1.88	2.07	10.2**
C: Herfindahl Index of Expenditure Shares across Channels			
All goods	0.306	0.285	-6.6**
Premium goods	0.353	0.335	-5.0**
Priced goods	0.302	0.286	-5.2**
D. Channel-days shopped at per 10-day period	6.276	6.709	6.9**
E. Average number of transactions per product per pseudo			
All goods	0.399	0.388	-2.9**
Food	0.546	0.537	-1.7*
Beauty products	0.244	0.226	-7.3**
Cleaning products	0.200	0.190	-4.6**

Notes:
* and ** denote significantly different from zero at the 5% and 1% levels of significance according to a t-test of difference in means. Means and standard errors are weighted by the number of households in a given pseudo and allow for clustering of standard errors at the pseudo-level.

TABLE 7: PROPORTION OF BUYERS USING EACH CHANNEL

Channel	2000	2001	2002	Test of equality 2001 and 2002
Hypermarkets	0.234	0.184	0.180	
Supermarkets	0.512	0.465	0.452	*
Discounts	0.099	0.120	0.153	*
Self-service (*Autoservicios*)	0.564	0.581	0.612	*
Grocery stores (*Almacenes*)	0.341	0.348	0.398	*
Wholesalers	0.020	0.019	0.035	*
Candy stores (*Kioscos*)	0.179	0.188	0.213	*
Drugstores	0.107	0.101	0.125	*
Barter clubs (*Trueque*)	0.000	0.001	0.020	*
Other Channels	0.381	0.380	0.392	*
Mean number of channels	2.439	2.388	2.579	*

Notes: For each channel and year, the table reports the average across 10-day periods of the proportion of pseudos using the channel. 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. * denotes that the 2001 proportion is significantly different from the 2002 proportion at the 5% significance level.

TABLE 8: DETERMINANTS OF SHOPPING FREQUENCY 2001-02
Dependent Variable: Shopping Frequency (Channel-days shopped at per 10 day period)

A. Results using all months	(1)	(2)	(3)
Log of real average monthly wage	-1.859	-3.382	-2.631
	(10.00)**	(18.41)**	(12.36)**
Year 2002 dummy * EPH change in log household labor income			-0.637
			(6.73)**
Pseudo-Household Fixed Effects	yes	yes	yes
Quantity of each product controlled for	no	yes	yes
Time effects	no	no	no
Observations	24445	24445	24445
Adjusted R-squared	0.5985	0.7231	0.7268
Number of pseudo-households	383	383	383

B. Results using EPH reference months of April and September only	(1)	(2)
EPH log labour income	-0.805	-0.994
	(8.86)**	(11.03)**
Pseudo-Household fixed effects	yes	yes
Quantity of each product controlled for	no	yes
Time effects	no	no
Observations	4070	3970
Adjusted R-squared	0.6410	0.7135
Number of pseudo-households	374	374

Notes: Robust t-statistics which allow standard errors to be clustered at the pseudo-household level are given in parentheses. The number of households within a pseudo are used as weights in the regressions. * significant at 5%; ** significant at 1%
Quantity controls are the quantity in kilograms or litres of each of 37 separate product categories.

TABLE 9: DETERMINANTS OF SHOPPING FREQUENCY 2001-02
Controlling for Unemployment, Inflation, Price Dispersion and Liquidity
Dependent Variable: Shopping Frequency (Channel-days shopped at per 10 day period)

A. Results using all months	(1)	(2)	(3)	(4)
Log of real average monthly wage	-2.631	-2.631		
	(12.36)**	(10.37)**		
Year 2002 dummy * EPH change in log household labor income	-0.637	-0.614	-0.586	-0.621
	(6.73)**	(4.67)**	(4.02)**	(3.75)**
Year 2002 dummy * EPH change in household labor hours		0.002	0.002	0.003
		(0.48)	(0.45)	(0.76)
Corralito premium		0.010		
		(2.77)**		
Food CPI inflation		0.004		
		(1.03)		
Aggregate price dispersion across channels		-1.957		
		(3.97)**		
Corralito premium * Credit card ownership				-0.001
				(0.05)
Pseudo-level inflation				0.011
				(0.36)
Pseudo-level price dispersion				0.513
				(0.35)
Pseudo-Household Fixed Effects	yes	yes	yes	yes
Quantity of each product controlled for	yes	yes	yes	yes
Time effects	no	no	yes	yes
Observations	24445	24445	24445	20422
Adjusted R-squared	0.7268	0.7273	0.7345	0.7662
Number of pseudo-households	383	383	383	325

B. Results using EPH reference months of April and September only	(1)	(2)	(3)	(4)
EPH log labour income	-0.994	-0.563	-0.215	-0.253
	(11.03)**	(6.00)**	(2.07)*	(2.30)*
EPH labour hours		0.001	0.000	0.001
		(0.32)	(0.17)	(0.36)
Corralito premium		0.287		
		(12.34)**		
Food CPI inflation		-0.114		
		(8.23)**		
Aggregate price dispersion across channels		-1.627		
		(0.65)		
Corralito premium * Credit card ownership				0.026
				(0.90)
Pseudo-level inflation				-0.054
				(0.64)
Pseudo-level price dispersion				7.033
				(1.43)
Pseudo-Household fixed effects	yes	yes	yes	yes
Quantity of each product controlled for	yes	yes	yes	yes
Time effects	no	no	yes	yes
Observations	4070	4070	4070	3525
Adjusted R-squared	0.7135	0.7372	0.7563	0.7649
Number of pseudo-households	374	374	374	344

Notes: Robust t-statistics which allow standard errors to be clustered at the pseudo-household level are given in parentheses. The number of households within a pseudo are used as weights in the regressions. * significant at 5%; ** significant at 1%. Quantity controls are the quantity in kilograms or litres of each of 37 separate product categories.

TABLE 10: PREVALENCE OF USE OF DIFFERENT ADJUSTMENT MECHANISMS

		Percentage of Households			
	All	2001 Household Labor Income Quartile			
Adjustment Mechanism	Pseudos	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 data

TABLE 11: ESTIMATING PRICE GAINS FROM SHOPPING MORE OFTEN FOR THE SAME QUANTITY
Dependent variable: log price

	(1)	(2)	(3)	(4)	(5)	(6)
Instrumented channel-days shopped per 10-day period	-0.039	-0.169	-0.184	-0.055	-0.188	-0.205
	(2.77)**	(11.99)**	(13.09)**	(3.57)**	(12.20)**	(13.40)**
Quality*Time*Product effects	Yes	Yes	Yes	No	No	No
Product*Time effects	No	No	No	Yes	Yes	Yes
Controls for location, household size, age of mother and child	No	Yes	No	No	Yes	No
Pseudo-household fixed effects	No	No	Yes	No	No	Yes
Number of Observations	128,470	128,470	128,470	128,470	128,470	128,470
Number of Clusters	1368	1368	1368	1368	1368	1368

Notes:
Standard errors clustered by the pseudo-household*time period in parentheses
** denotes statistical significance at the 1% level
Channel-days are instrumented using pseudo-level income from the EPH, holding quantities fixed (see text).
Pseudo-household fixed effects include the complete interaction of location, household size, age of mother, and age of youngest child variabe.

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 (a)	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 (b)	2.2	4.1	4.6	5.7	6.8	5.6
Food items collected by Latinpanel (c)	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 (d)	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 (e)	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 = (c)/((a)-(b))	38.4	39.6	42.0	45.2	49.9	44.5
Latinpanel Food, Cleaning and Beauty as Share of Total Expenditure = (c)+(d)+(e)	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