

A changing market: expenditures by Hispanic consumers, revisited

As the composition of the Hispanic population changed, Hispanic consumers continued to increase their share of spending at a substantial pace; a revisited study examines whether changes in expenditure patterns are due to changes in income or other similar factors, or due to changes in underlying preferences

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The Hispanic population in the United States continues to grow. Accounting for more than 6 percent of the U.S. population in 1980, the share nearly doubled by the year 2000, with Hispanics accounting for just under 12 percent of the population.¹ Growing at more than 1 percent every 5 years since 1980, the Hispanic population experienced its largest increase during the 1995–2000 period, when it increased nearly 1.5 percent. Similarly, Hispanics account for an increasing portion of consumer spending—more than 6 percent in 1995 and more than 7 percent in 2000.²

Many authors treat Hispanics as a homogenous group, and have shown differences in expenditure patterns from other groups, such as White and Black consumers.³ However, recent work has shown that within the Hispanic community, expenditure patterns differ substantially by geographic origin. That is, families of Mexican origin spend differently from those of Puerto Rican, Cuban, or those of other Hispanic origin. This is true of expenditure patterns in general,⁴ and for expenditures on specific items, such as food.⁵ Due to these differences, it is important to note that the size and composition of the U.S. Hispanic population are changing. From 1994–95 to 2000–01, the number of Hispanic consumer units grew faster (21.8 percent) than the number of non-Hispanic

consumer units (5.9 percent).⁶ Among those Hispanic consumer units, the growth rates ranged from 9.4 percent for Mexican families to 76.6 percent for other Spanish families. The change in composition can be seen when examining the distribution of consumer units by ethnic origin. Although Mexican origin was still the largest segment in 2000–01 (56 percent), it has fallen as a share of all Hispanic consumer units since 1994–95 (62 percent). The Puerto Rican share was a little more than 11 percent in both years, while all other groups saw increases in their shares of Hispanic families over the same time period. Cuban and Central or South American families increased their shares between 1 percentage point and 2 percentage points; those of other Spanish origin increased their share by nearly 4 percentage points. (See table 1.) It is important to point out that some of these changes are undoubtedly due to changes in procedures used by the source from which these data are obtained. However, independent sources also show differences in growth patterns within the Hispanic community.⁷

Given the diversity of expenditure patterns across geographic origin, and the changing composition of the Hispanic market, it is important to examine recent expenditure patterns for the Hispanic population in the United States. In addition to examining the most recent data available, that is, data from 2000–01, this article

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Table 1. Weighted numbers and distributions of Hispanic and non-Hispanic consumer units, 1994–95 and 2000–01

Characteristic	Number of consumer units		Percent change
	1994–95	2000–01	
All consumer units	102,313,790	109,606,058	7.1
Hispanics	7,791,811	9,491,475	21.8
Non-Hispanics	94,521,979	100,114,583	5.9
Total Hispanics	7,791,811	9,491,475	21.8
Mexican	4,835,721	5,289,878	9.4
Puerto Rican	897,347	1,081,220	20.5
Cuban	357,584	579,773	62.1
Central or South American	1,049,660	1,390,334	32.5
Other Spanish	651,499	1,150,271	76.6
	Percentage of consumer units		Change in percentage
	1994–95	2000–01	
All consumer units	100.0	100.0	
Hispanics	7.6	8.7	1.1
Non-Hispanics	92.4	91.3	-1.1
Total Hispanics	100.0	100.0	
Mexican	62.1	55.7	-6.4
Puerto Rican	11.5	11.4	-.1
Cuban	4.6	6.1	1.5
Central or South American	13.5	14.6	1.1
Other Spanish	8.4	12.1	3.9

updates previous work in this area, which examined expenditures that occurred in 1994–95.⁸ Because the intra-ethnic differences for Hispanic consumers are well-established in the literature, this article examines differences within the Hispanic community rather than comparing Hispanics as a whole to other groups, as the previous work had done. Otherwise, the analysis is similar: Expenditure patterns are examined at the aggregate (total consumer spending) level; for the average consumer unit within each Hispanic group; and using regression analysis to estimate how spending patterns differ for Hispanic groups when income and characteristics other than geographic origin are the same.

The data

The data used in this study are from the Interview component of the Consumer Expenditure Survey. The Interview survey is a panel survey designed to collect expenditure information from families over five consecutive periods. During the second through fifth interviews, the respondent is asked to recall expenditures for the last 3 months for most items in the survey. The first interview, which has a 1-month recall period, is used for bounding purposes—that is, to make sure that the expenditures reported took place during the reference period. (For example, a family that purchased a refrigerator during the month prior to the first interview should report it during the first interview. If the respondent for that same family

reports purchasing a refrigerator in the second interview, the interviewer can make sure that the respondent is not referring to the same refrigerator reported in the first interview.) The Interview survey is designed primarily to collect recurring (for example, rent or insurance) and “big ticket” (for example, automobiles or major appliances) expenditures, because outlays for such items tend to be remembered for long periods. Although it is designed primarily to collect expenditures for relatively large purchases and expenses that occur on a regular basis, the Interview survey covers up to 95 percent of all expenditures.⁹ Although the sample size for the Interview survey was about 5,000 consumer units per quarter in 1994–95, the sample size increased in 1999 to include about 7,500 consumer units per quarter.

The sample used for study in this article includes all consumer units interviewed in 2000 or 2001, who identify their reference person¹⁰ as being of Mexican; Puerto Rican; Cuban; Central or South American; or other Spanish origin.¹¹ The sample includes observations from 5,546 Hispanic consumer units interviewed in 2000–01. The smallest group is Cubans (335 consumer units), and the largest group is Mexicans (3,212 consumer units). However, the observations may not be of *unique* consumer units. In the Consumer Expenditure Survey, the data are collected so that each quarter of data can be treated independently, even if consumer units have participated for more than one quarter. The data examined here are weighted to reflect the U.S. population.

Demographic characteristics

Among the several demographic characteristics for each of the Hispanic groups under study, income before taxes and age of reference person appear to have changed substantially over the 1994–95 to 2000–01 period. (See table 2.) On average, income before taxes appears to have experienced increases over time for complete income reporters.¹² The smallest increase is for Puerto Ricans (5.8 percent); the largest is for Central or South Americans (46.1 percent). Except for Puerto Ricans and other Spanish families, these increases all are statistically significant. However, these changes are only correct for nominal income. The Consumer Price Index (CPI) rose from 150.3 in the 1994–95 period to 174.7 in 2000–01; an increase of 16.2 percent. After adjusting for inflation, the outcomes are very different. Puerto Ricans had lower earnings in real (that is, inflation-adjusted) dollars (–8.9 percent). Income for all other groups increased, but at varying rates. Other Spanish real income rose 2.2 percent, while income for Central or South Americans rose 25.8 percent in real terms. Furthermore, none of these changes (increases or declines) is statistically significant for any individual group, once variance is taken into account. Similarly, over the same period, age of reference person appears to have changed for several groups. Relatively large changes in average age appear for Puerto Rican, Cuban, and other Spanish families. However, when the variance in each year is taken into account, the changes in age are not found to be statistically significant.

Several demographics for which percent reporting is shown have also changed, and in ways that one would probably associate with improved economic status. For example, the percentage of homeowners increased for all Hispanics from 42 percent to nearly 47 percent over the study period. In particular, large changes are seen for Puerto Ricans (26 to 35 percent); Cubans (46 to 59 percent); and other Spanish families (37 to 61 percent). Educational attainment has also increased for most groups, with declines in high school or less education, and increases in percent reporting at least some college. The exception is other Spanish families, for whom the percent reporting some high school or less rose sharply, from 19 percent to 31 percent. In contrast, the percent reporting high school graduation dropped from 30 percent to 22 percent. Similarly, the percentage of college graduates dropped from 23 percent to 15 percent. Other than the group of some high school or less, only the group with some college increased, from 28 percent to 32 percent among those reporting for other Spanish families. Several groups also reported higher percentages of reference persons for their consumer units who were working for pay. For example, Puerto Ricans reported 60 percent working (58 percent for a wage or salary; 2 percent self-employed) in 1994–95, compared with 68 percent in 2000–01. Although the percent

retired rose, from 7 percent to 10 percent, for this group, the proportion not working for reasons other than retirement fell from 34 percent to 24 percent. Similarly, Central or South American households reported 78 percent of reference persons working in 1994–95, and 19 percent not working for reason other than retirement. However, in 2000–01, the working proportion rose to 84 percent, and the other-reasons-not-working proportion fell to 11 percent. In most other cases, the proportions were similar in each period, with the exception of other Spanish households. For this group, the percent reporting that the reference person works dropped from 70 percent to 66 percent. Wage and salary reporters dropped from 67 to 60 percent, while reports of self-employment rose from 3 percent to 6 percent. The largest change, though, was in retirement: 9 percent of these other Spanish households reported a retired reference person in 1994–95, compared with 20 percent in 2000–01. At the same time, the percent reporting reference persons not working for reasons other than retirement dropped from more than 1 in 5 to about 1 in 7. Whether the changes in occupational status indicate higher economic status is an open question. It may be that the “others not working for pay” rate was higher in 1994–95 than 2000–01 because more families in 1994–95 could afford to have the reference person stay at home than those could in 2000–01. (One of the reasons for “others not working pay,” for example, is staying home to take care of children or family members.) If the changes described in the composition of the Hispanic community are due to increases in immigration by different groups, this also could play a role, as it is reasonable to assume that the desire to work is a major factor in the decision to immigrate.¹³

Other characteristics were stable over the period. For example, family composition did not change much for most Hispanic families, except for Cubans, who are less likely to be single and more likely to be “other families” in 2000–01 than in 1994–95. Similarly, other Spanish families experienced an increase in married-couple families (with and without children) and a decrease in other families. Degree of urbanization did not change substantially, except for other Spanish families; for this group in 1994–95, there were about 30 urban families for every rural family; but in 2000–01, there were only 2 urban families for every rural family.

Changes by region are also interesting. Except for Mexican and Puerto Rican families, all groups show smaller proportions in the Northeast in 2000–01 than in 1994–95. Which region experiences growth at the expense of the Northeast’s decline is different across Hispanic groups.

All groups but one show increases in the proportion of non-White families. The exception is other Spanish, for which the proportion of White families rises from 89 percent to 92 percent, and the proportion of Black families declines

Table 2. General characteristics of Hispanics by geographic origin, 1994–95 and 2000–01

General characteristic	Geographic origin of reference person											
	All Hispanics		Mexican		Puerto Rican		Cuban		Central or South American		Other Spanish	
	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01
Sample size	2,940	5,446	1,727	3,212	331	574	174	335	434	784	274	541
Number of consumer units represented	7,791,811	9,491,476	4,835,721	5,289,878	897,347	1,081,220	357,584	579,773	1,049,660	1,390,334	651,499	1,150,271
Percent of consumer units represented ...	100.0	100.0	62.1	55.7	11.5	11.4	4.6	6.1	13.5	14.6	8.4	12.1
Income before taxes ¹	\$27,112	\$34,984	\$26,063	\$33,703	\$28,332	\$29,984	\$28,370	\$38,813	\$28,781	\$42,057	\$29,703	\$35,284
Percent complete reporters	87.8	83.9	87.3	84.6	84.5	84.6	92.6	84.4	89.6	82.3	89.9	82.8
Age of reference person	41.0	42.5	40.1	40.6	40.5	43.5	54.7	50.0	39.2	40.7	43.3	48.4
Average number in consumer unit:												
Persons	3.4	3.4	3.7	3.8	3.0	2.9	2.4	2.7	3.2	3.1	2.8	2.5
Under 18	1.3	1.2	1.5	1.5	1.1	1.0	.5	.6	1.2	.9	.9	.7
Age 65 and older .....	.2	.2	.2	.2	.2	.2	.5	.4	.1	.1	.2	.4
Earners	1.5	1.6	1.6	1.8	1.1	1.3	1.2	1.3	1.5	1.8	1.4	1.3
Vehicles	1.6	1.6	1.8	1.7	.9	1.1	1.3	1.4	1.3	1.3	1.5	1.7
Automobiles	1.1	.9	1.1	.9	.8	.8	1.1	.9	1.1	.9	1.1	1.0
Other vehicles ..	.5	.7	.7	.8	.1	.3	.2	.5	.2	.4	.4	.7
Housing characteristics:												
Rooms (excluding bedrooms)	4.8	4.8	4.8	4.8	4.8	4.7	4.5	4.6	4.7	4.5	5.0	5.1
Bedrooms	2.4	2.4	2.4	2.4	2.3	2.3	2.1	2.6	2.3	2.2	2.4	2.5
Bathrooms	1.3	1.4	1.3	1.4	1.2	1.2	1.5	1.7	1.4	1.4	1.3	1.4
Half-baths .....	.1	.1	.1	.1	.1	.2	.1	.2	.2	.2	.2	.2
Percent distribution:												
Housing tenure:												
Homeowner	42.1	46.8	48.1	48.1	26.2	35.1	45.5	58.8	30.5	33.8	36.5	61.1
With mortgage ...	28.0	29.8	29.4	30.3	22.4	24.4	31.9	45.7	27.3	27.0	24.7	27.6
Without mortgage	14.1	17.0	18.7	17.8	3.8	10.7	13.6	13.2	3.2	6.9	11.8	33.5
Renter	57.9	53.2	51.9	51.9	73.8	64.9	54.5	41.2	69.5	66.2	63.5	38.9
Race of reference person:												
White	95.6	93.9	97.9	96.7	93.2	88.6	94.7	91.4	91.5	89.4	89.4	92.3
Black	3.3	4.5	0.9	1.4	4.9	10.7	5.3	7.1	7.4	9.8	10.4	5.2
Other	1.1	1.6	1.2	1.9	1.9	.7	(²)	1.5	1.1	.8	(²)	2.5
Education of reference person:												
Some high school or less	45.0	41.8	52.0	49.9	40.8	37.2	42.0	26.8	34.0	29.6	18.6	30.9
High school graduate	26.1	24.4	25.9	24.5	28.7	27.9	20.7	25.6	23.8	22.9	30.4	22.3
Some college	18.6	22.5	16.4	19.6	19.5	25.4	18.2	23.1	22.6	23.3	27.7	31.7
College graduate	10.3	11.3	5.7	6.1	10.9	9.5	19.0	24.5	19.6	24.2	23.3	15.0
Family composition:												
Single person	15.8	15.8	11.8	11.0	19.7	19.4	36.2	19.2	17.7	18.2	25.7	29.8
Husband and wife only	10.9	10.3	11.6	8.5	7.2	9.8	17.2	16.0	8.1	9.4	11.7	17.6
Husband and wife, own children only	34.1	33.3	38.6	38.5	27.0	22.5	26.1	23.2	30.5	32.1	20.9	26.2
Single parent	11.9	9.1	10.4	8.2	22.0	17.5	2.6	4.8	15.4	7.8	9.1	9.0
Other families	27.3	31.5	27.7	33.9	24.1	30.7	17.9	36.8	28.3	32.4	32.6	17.5

See footnotes at end of table.

Table 2. Continued—General characteristics of Hispanics by geographic origin, 1994–95 and 2000–01

General characteristic	Geographic origin of reference person											
	All Hispanics		Mexican		Puerto Rican		Cuban		Central or South American		Other Spanish	
	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01
Region												
Northeast	16.7	15.5	0.8	1.5	67.7	67.7	16.0	7.3	37.8	29.0	30.1	18.8
Midwest	7.1	7.0	8.3	7.8	4.8	9.6	.4	6.1	6.5	4.8	6.0	4.2
South	35.6	34.9	35.6	37.6	24.7	17.8	75.4	78.0	30.1	35.7	37.5	15.8
West	40.7	42.6	55.3	53.1	2.8	5.0	8.2	8.6	25.7	30.5	26.3	61.2
Degree Urbanization												
Urban	98.3	93.8	98.2	96.5	98.2	99.7	100.0	96.8	99.2	99.4	96.8	67.9
Rural	1.7	6.2	1.8	3.5	1.8	.3	(²)	3.2	.8	.6	3.2	32.1
Working status of reference person:												
Wage or salary earner	72.1	71.9	76.3	75.3	57.8	65.9	63.6	65.0	71.1	77.8	66.7	59.8
Self-employed	3.8	3.6	3.8	2.9	2.1	1.9	2.0	2.1	6.5	5.9	3.0	6.3
Retired	8.6	9.2	9.0	6.6	6.6	9.8	22.6	20.5	3.4	5.4	9.1	19.7
Other not working ...	15.5	15.3	10.9	15.3	33.6	23.5	11.8	12.3	19.0	10.9	21.2	14.3

¹ Complete income reporters only.² No data reported.

substantially, from 10 percent to 5 percent. However, the proportion from other races increases over the period from virtually none in 1994–95 (there were no data reported that year) to 3 percent in 2000–01.

Expenditure patterns

Aggregate expenditures. Aggregate annual expenditures are the total dollars in the economy that are accounted for by each group's spending. The term "aggregate expenditure shares" in this case is defined as the proportion of total "Hispanic expenditures" accounted for by each group. Table 3 shows aggregate annual expenditures and aggregate expenditure shares for Hispanics in 1994–95 and 2000–01. Note that in every case (except reading) aggregate expenditures rose from 1994–95 to 2000–01, at least for Hispanics as a whole. This is less meaningful than it might seem at first glance, because these data are in nominal dollars—that is, they do not account for inflation. This adjustment will be made subsequently. More useful, perhaps, is to examine aggregate expenditure shares. Most groups accounted for their expected share for most items (according to their share of the population), but spent differently than expected for other items. For example, in 2000–01, Mexican families account for 56 percent of Hispanic families, and account for 56 percent of Hispanic spending on apparel and services, but they account for less spending than expected for housing (51 percent) and more for transportation (59 percent). These differences are similar to the earlier period; Mexicans accounted for 62 percent of Hispanic households, 58 percent of Hispanic housing expenditures, and 65 percent of Hispanic expenditures on transportation.

As in 1994–95, expenditures on transportation in 2000–01 show interesting patterns. Mexican families account for a little more spending on private transportation, and Puerto Ricans account for less than expected; but other groups account for approximately their population share. However, the public transportation share varies substantially from the population share for all groups except other Spanish consumer units (who account for 12 percent of the Hispanic population, and 11 percent of Hispanic public transportation expenditures). Mexican families (56 percent of Hispanic families) and Cuban families (6 percent of Hispanic families) account for far less of the aggregate public transportation expenditure—38 percent for Mexican families, and 3 percent for Cuban families. Puerto Rican families (11 percent of Hispanic families) and Central or South American families (15 percent of Hispanic families) account for far greater shares than expected—21 percent for Puerto Ricans, and 28 percent for Central or South American families.

In health care, the results are mixed among the groups. Other Spanish families spend more than their share for all components of health care. Cuban families also spend more than their share for all components except medical supplies. Puerto Rican families spend less than their share for all components, as do Mexican families (except for prescription drugs, which, at 57 percent, is slightly larger than their population share). Central or South American families show mixed results for each component.

Expenditure levels and percent reporting. As with aggregate annual expenditures, nearly all expenditures in 2000–01 are larger than those in 1994–95. However, this does not necessarily mean that any group is purchasing more—it may only be a

Table 3. Aggregate expenditure shares for Hispanics by geographic origin of the reference person, 1994–95 and 2000–01

Expenditure category	Total Hispanics		Aggregate expenditure share (in percent)									
			Mexican		Puerto Rican		Cuban		Central or South American		Other Spanish	
	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01
Number	7,791,811	9,491,476	4,835,721	5,289,878	897,347	1,081,220	357,584	579,773	1,049,660	1,390,334	651,499	1,150,271
Percent of total Hispanics	100.0	100.0	62.1	55.7	11.5	11.4	4.6	6.1	13.5	14.6	8.4	12.1
Total expenditures (in billions of dollars)	\$194.1	\$290.9	60.2	53.7	10.7	10.1	4.6	7.0	15.3	17.6	9.1	11.6
Food at home	29.3	38.6	60.8	56.6	12.4	10.8	4.3	5.9	13.9	16.3	8.5	10.4
Housing (excluding vacation and pleasure trips)	64.9	97.1	57.9	51.4	11.8	11.3	4.4	7.9	17.1	18.6	8.8	10.8
Shelter and utilities	56.2	83.3	57.2	51.4	12.0	11.6	4.2	7.9	17.7	18.4	8.9	10.7
Other housing	8.6	13.7	62.1	51.0	10.8	9.7	5.4	8.3	13.1	19.7	8.5	11.4
Apparel and services	9.7	12.5	64.3	55.9	10.4	11.1	3.1	5.0	13.7	16.4	8.5	11.6
Transportation excluding vacation and pleasure trips)	36.1	62.9	65.3	58.8	7.3	7.7	4.2	6.4	14.0	15.7	9.1	11.5
Private	35.2	61.8	66.3	59.1	7.0	7.4	4.2	6.5	13.6	15.4	8.9	11.5
Public (excluding vacation and pleasure trips) ....	.9	1.1	27.2	38.1	20.3	21.3	5.8	2.7	30.5	27.5	16.3	10.7
Health care	7.5	11.1	60.9	50.8	10.0	9.5	6.1	8.3	14.2	15.1	8.8	16.2
Health insurance	3.7	5.8	61.3	47.9	12.2	10.6	7.8	9.4	9.0	14.5	9.6	17.5
Medical services	3.0	3.4	60.9	53.9	6.4	7.6	3.6	7.5	21.3	18.2	7.6	13.0
Prescription drugs .....	.6	1.4	59.7	56.9	11.8	10.0	7.8	6.9	10.6	10.8	9.6	15.4
Medical supplies .....	.2	.4	55.4	47.4	15.2	9.0	5.1	4.7	15.9	12.5	8.4	26.0
Recreation and related expenditures .	17.3	25.5	57.3	52.5	11.3	10.9	5.4	7.3	15.9	17.1	10.2	12.2
Food away from home	7.0	10.3	60.3	56.0	9.5	9.3	5.4	6.2	16.5	16.8	8.4	11.6
Entertainment	7.3	10.9	58.9	53.8	11.4	11.1	5.2	7.2	13.7	15.1	10.8	12.9
Reading .....	.6	.6	50.5	51.1	13.7	12.2	5.5	6.7	18.5	15.1	12.5	15.6
Transportation (on trips)	1.5	2.1	42.8	40.5	15.6	13.0	6.1	10.6	21.0	26.4	14.3	9.3
Other lodging	1.0	1.7	49.4	38.1	14.9	15.8	6.0	10.9	18.3	21.2	11.3	13.9
Other	29.3	45.7	58.6	50.6	10.8	9.5	5.6	7.1	15.0	20.0	9.9	12.9
Alcohol	1.4	2.0	65.8	55.0	6.8	8.7	5.6	6.9	14.6	17.9	7.3	11.5
Tobacco and smoking supplies	1.1	1.7	52.2	46.9	23.6	17.0	4.0	8.4	9.6	13.4	10.6	14.2
Education	2.2	3.2	39.6	35.6	17.7	12.4	7.1	6.8	26.6	26.9	8.8	18.2
Personal care	1.6	2.2	55.8	52.0	10.6	10.4	7.5	7.2	16.9	17.6	9.4	13.0
Cash contributions ..	3.3	6.5	58.0	46.1	8.4	8.0	10.3	5.1	13.4	30.5	9.8	10.2
Personal insurance .	15.7	25.4	59.3	53.6	10.4	9.3	4.5	7.0	14.6	17.2	11.2	12.9
Miscellaneous	4.0	4.7	66.8	49.3	8.6	7.7	5.4	9.9	12.4	20.1	6.8	13.0

reflection of increasing prices. To help account for this, the percent change between 1994–95 and 2000–01 in each expenditure is shown in table 4 for each group. As noted earlier, the CPI for all items rose 16.2 percent from 1994–95 to 2000–01. Therefore, if all goods and services under study had price increases at the same rate, expenditures for each good and service would be expected to rise 16.2 percent if quantities purchased did not change. Increases in expenditures of more than 16.2 percent would indicate larger quantities purchased, while increases of less than 16.2 percent

(or decreases in expenditures) would indicate a decrease in quantity purchased. Even so, using the CPI in this way must be done with caution. The CPI is most useful when market baskets (the mix of goods and services purchased) do not change over time. It is possible that a change in real expenditure as measured by deflating a nominal expenditure by the CPI may be due to the fact that consumers are purchasing a different combination of goods and services in the second period than in the first, rather than a change in the total number of goods and services purchased.

The CPI for all items is most reliable for total expenditures, because the index reflects price changes in overall consumer purchases. Given this, it can be seen from table 4 that for Hispanics in general, total expenditures increased in real terms over this period. That is, the average annual expenditure for all Hispanics rose 23.0 percent, in excess of the 16.2 percent threshold. However, the table also shows that the increases were not consistent across groups: the rate of increase for Central or South American families (29.5 percent) and Cuban families (40.6 percent) was much faster than the rate of increase in the CPI. For other Spanish families, the increase (8 percent) was smaller than the increase in the CPI. These findings are less surprising when considering changes in real income, described earlier. Puerto Rican families had the only decline in real income (9 percent), and other Spanish families had the smallest increase (2 percent). Central or South American families (26 percent) and Cuban families (18 percent) had the largest increases in real income. Mexican families, whose total expenditures rose slightly faster (18.2 percent) than the CPI (16.2 percent), had increases in real income of 11.3 percent.

For other expenditures, analysis using the CPI for all items may not accurately reflect changes in spending patterns. For example, expenditures for apparel and services by all Hispanics rose by only 6 percent during the period under study. Applying the CPI for all items to this item would make it appear that Hispanics on average dramatically reduced their clothing purchases. However, the CPI specifically for apparel and services declined 3.2 percent during the period under study. Therefore, quantities purchased increased substantially for the average Hispanic consumer unit. To correct for this, changes in expenditures for selected items are compared with changes in their price indexes. Most of the items selected are major categories from table 4 (for example, food at home). However, caution should be used when interpreting these data. As noted earlier, there may be changes in the composition of the market basket for a particular good or service. For example, when considering food at home, consumers may still purchase the same total number of pounds of meat in two periods, but may purchase more beef and less poultry in one period than the other. Assuming the prices are different for these goods, the reallocation of purchases by itself would cause expenditures for food at home to change, even if prices for all food items were constant over time. In addition, although the CPI category may appear to match the expenditure, there may be differences in the CPI category and the expenditure category. For example, the CPI for transportation includes changes in prices of airfares. Expenditures for airfares in this study are included in "transportation on trips," which is included in the separate "recreation and related expenditures" category.

The CPI for food at home increased at about the same rate (16.5 percent) as the CPI for all items. Given this increase in prices, it is interesting to see dramatic declines in real

expenditures for food at home for most Hispanics. For the average Hispanic family, expenditures for food at home rose only 8.0 percent. For Mexican families (12.0 percent) and Cuban families (11.1 percent), the rate of increase in expenditures for food at home was also less than the CPI for food at home. Expenditures actually fell in nominal terms for Puerto Rican families (4.9 percent) and other Spanish families (9.5 percent). Only for Central and South American families (16.5 percent) was the rise in these expenditures consistent with the rise in the CPI for food at home, meaning there was no real change in food at home expenditures for these families. When examining expenditures for food away from home, the situation becomes no clearer. The CPI for food away from home increased 16.4 percent, also at about the same rate as the CPI for all items. Expenditures for food away from home rose faster for Mexican families (25.0 percent) and for Puerto Rican families (nearly 19.5 percent), but at about the same rate for (16.2 percent) for other Spanish families. For the two remaining groups, the increases in expenditures were smaller than the increase in the CPI for food away from home: 13.6 percent for Central or South American families, and 3.3 percent for Cuban families. For Mexican families, whose expenditures for food at home rose 12 percent, some of the decrease in real terms may be due to increases in real terms in expenditures for food away from home. But clearly, this is not true for all other Hispanic families. It is important to keep in mind, though, that lower real expenditures in this case do not necessarily mean that Hispanic families are eating less food. It may be that they are buying food both at, and away from home in 2000–01 that is less expensive than the food bought in 1994–95. This could be due to dietary differences in Hispanic and non-Hispanic families, because the CPI for food at home is based on the average American urban family, and it is not adjusted by ethnicity. Other literature has shown that Hispanics have different food-at-home expenditure patterns than non-Hispanics, and if Hispanics tend to eat foods that are lower in price than non-Hispanics, this could also explain some of the difference.¹⁴

The CPI for housing rose 18 percent from 1994–95 to 2000–01, compared with a 23-percent increase in expenditures on housing (less trips) for all Hispanics. Several groups experienced increases in housing expenditures that were somewhat above the CPI change: Mexican families (21 percent); Puerto Rican families (19 percent); and Central or South American families (23 percent). For Cuban families, however, the increase in housing expenditures (67 percent) was markedly higher than the CPI increase; and for other Spanish families, it was markedly lower (less than 4 percent). This is interesting, because table 2 shows that the average size of dwellings occupied by Hispanic families has not substantially changed over this period. For other Spanish families, part of the answer may lie in the fact that a substantially larger proportion of these families live in rural

Table 4. Average annual expenditures and expenditure shares for Hispanics by geographic origin of the reference person, 1994–95 and 2000–01

Expenditure category	Average annual expenditures (nominal dollars)								
	Total Hispanics			Mexican			Puerto Rican		
	1994–95	2000–01	Percent change	1994–95	2000–01	Percent change	1994–95	2000–01	Percent change
Number	7,791,811	9,491,476	21.8	4,835,721	5,289,87	9.4	897,347	1,081,220	20.5
Percent of total Hispanics	100.0	100.0	...	62.1	55.7	...	11.5	11.4	...
Total expenditures	\$24,911	\$30,651	23.0	\$24,164	\$29,545	22.3	\$23,194	\$27,191	17.2
Food at home	3,761	4,063	8.0	3,686	4,127	12.0	4,052	3,853	-4.9
Housing (excluding vacation and pleasure trips)	8,325	10,225	22.8	7,764	9,424	21.4	8,533	10,162	19.1
Shelter and utilities	7,216	8,779	21.7	6,653	8,102	21.8	7,489	8,937	19.3
Other housing	1,110	1,446	30.3	1,111	1,322	19.0	1,045	1,225	17.2
Apparel and services	1,246	1,322	6.1	1,291	1,325	2.6	1,125	1,292	14.8
Transportation (excluding vacation and pleasure trips)	4,632	6,629	43.1	4,875	6,989	43.4	2,950	4,453	50.9
Private	4,518	6,515	44.2	4,825	6,911	43.2	2,749	4,241	54.3
Public (excluding vacation and pleasure trips)	114	114	.0	50	78	56.0	201	213	6.0
Health care	966	1,166	20.7	948	1,063	12.1	838	976	16.5
Health insurance	480	615	28.1	474	529	11.6	509	573	12.6
Medical services	380	361	-5.0	373	349	-6.4	211	241	14.2
Prescription drugs	79	143	81.0	76	146	92.1	81	125	54.3
Medical supplies	28	47	67.9	25	40	60.0	37	37	.0
Recreation and related expenditures	2,219	2,684	21.0	2,047	2,529	23.5	2,170	2,558	17.9
Food away from home	894	1,080	20.8	869	1,086	25.0	740	884	19.5
Entertainment	937	1,150	22.7	889	1,110	24.9	924	1,116	20.8
Reading	75	60	-20.0	61	55	-9.8	89	64	-28.1
Transportation (on trips)	190	220	15.8	131	160	22.1	258	252	-2.3
Other lodging	123	174	41.5	98	119	21.4	159	242	52.2
Other	3,762	4,815	28.0	3,553	4,370	23.0	3,528	4,012	13.7
Alcohol	182	215	18.1	193	212	9.8	108	165	52.8
Tobacco and smoking supplies	145	176	21.4	122	148	21.3	297	262	-11.8
Education	276	332	20.3	176	212	20.5	423	362	-14.4
Personal care	207	236	14.0	186	220	18.3	191	215	12.6
Cash contributions	426	686	61.0	398	567	42.5	311	481	54.7
Personal insurance	2,013	2,676	32.9	1,925	2,573	33.7	1,815	2,193	20.8
Miscellaneous	513	495	-3.5	552	438	-20.7	383	336	-12.3

areas in 2000–01 (32 percent) than in 1994–95 (3 percent). It may be that rents and mortgages are much lower in rural areas than in urban areas for similarly sized dwellings. If so, this does not appear to explain the sharp rise in expenditures for Cuban families. Although no Cuban families reported residing in rural areas in 1994–95, only 3 percent reported rural residence in 2000–01. However, there was a larger proportion of owners with mortgages in 2000–01 (46 percent) than in 1994–95 (32 percent). Similarly, for other Spanish consumer units, the percent reporting ownership without mortgage rose substantially, from 12 percent to 34 percent. Differences in

ownership and rental costs may explain some of the differences for these groups over time.

For all groups except Cubans and Central or South Americans, expenditures for apparel and services rose less rapidly than the CPI for all items. However, as the CPI for apparel and services declined 3.2 percent from 1994–95 to 2000–01, Hispanics appeared to either buy more apparel and services than they used to, or perhaps more expensive apparel and services than the population as a whole. The percent increase ranges from 0.3 percent for other Spanish families to 28.3 percent for Cuban families. The evidence presented in

Table 4. Continued—Average annual expenditures and expenditure shares for Hispanics by geographic origin of the reference person, 1994–95 and 2000–01

Expenditure category	Average annual expenditures (nominal dollars)								
	Cuban			Central of South American			Other Spanish		
	1994–95	2000–01	Percent change	1994–95	2000–01	Percent change	1994–95	2000–01	Percent change
Number	357,584	579,773	62.1	1,049,660	1,390,334	32.5	651,499	1,150,271	76.6
Percent of total Hispanics	4.6	6.1	...	13.5	14.6	...	8.4	12.1	...
Total expenditures	\$25,127	\$35,341	40.6	\$28,367	\$36,727	29.5	\$27,127	\$29,286	8.0
Food at home	3,535	3,926	11.1	3,884	4,524	16.5	3,839	3,475	-9.5
Housing (excluding vacation and pleasure trips)	7,953	13,273	66.9	10,584	12,973	22.6	8,770	9,110	3.9
Shelter and utilities	6,651	11,312	70.1	9,505	11,028	16.0	7,642	7,750	1.4
Other housing	1,301	1,960	50.7	1,080	1,945	80.1	1,128	1,361	20.7
Apparel and services	848	1,088	28.3	1,264	1,481	17.2	1,263	1,267	.3
Transportation (excluding vacation and pleasure trips)	4,264	6,958	63.2	4,813	7,086	47.2	5,058	6,303	24.6
Private	4,122	6,907	67.6	4,555	6,871	50.8	4,836	6,202	28.2
Public (excluding vacation and pleasure trips)	143	51	-64.3	258	214	-17.1	222	101	-54.5
Health care	1,287	1,585	23.2	1,019	1,204	18.2	1,014	1,557	53.6
Health insurance	818	945	15.5	322	609	89.1	552	888	60.9
Medical services	302	441	46.0	602	449	-25.4	344	387	12.5
Prescription drugs	135	162	20.0	62	105	69.4	91	182	100.0
Medical supplies	31	36	16.1	33	40	21.2	28	101	260.7
Recreation and related expenditures	2,617	3,206	22.5	2,613	3,137	20.1	2,712	2,705	-.3
Food away from home	1,055	1,090	3.3	1,092	1,240	13.6	893	1,038	16.2
Entertainment	1,058	1,356	28.2	955	1,186	24.2	1,215	1,223	.7
Reading	90	66	-26.7	103	62	-39.8	112	77	-31.3
Transportation (on trips)	254	383	50.8	296	397	34.1	325	168	-48.3
Other lodging	161	311	93.2	167	252	50.9	166	199	19.9
Other	4,624	5,579	20.7	4,190	6,586	56.7	4,471	5,117	14.4
Alcohol	223	243	9.0	197	263	33.5	159	204	28.3
Tobacco and smoking supplies	126	243	92.9	103	161	56.3	183	206	12.6
Education	430	372	-13.5	545	610	11.9	292	499	70.9
Personal care	339	277	-18.3	260	283	8.8	233	254	9.0
Cash contributions	955	575	-39.8	425	1,430	236.5	499	580	16.2
Personal insurance	1,953	3,068	57.1	2,188	3,140	43.5	2,686	2,845	5.9
Miscellaneous	599	800	33.6	472	678	43.6	419	529	26.3

table 5, which shows the percent reporting each expenditure in 1994–95 and 2000–01, tends to support the latter hypothesis (more expensive apparel purchased) over the former (more apparel purchased). For Puerto Rican families, the percent reporting rises slightly, from 82 percent to 84 percent. For all other Hispanic families, it falls. The smallest decline is for Mexican families (3 percentage points) and the largest is for other Spanish families (15 percentage points). Given that

percent reporting is lower in most cases, this would suggest that Hispanics are buying apparel and services less frequently than they used to, but that they are paying more for the apparel and services than they used to, even after adjusting for general apparel and service price increases.

Similarly, expenditures for transportation (excluding vacation and pleasure trips) rose much more rapidly (43.1 percent) for Hispanics than did the price index for trans-

Table 5. Percent reporting expenditures for Hispanics by geographic origin of the reference person, 1994–95 and 2000–01

Characteristic	Total Hispanics			Mexican			Puerto Rican		
	1994–95	2000–01	Percentage point change	1994–95	2000–01	Percentage point change	1994–95	2000–01	Percentage point change
Number	7,791,811	9,491,476	...	4,835,721	5,289,878	...	897,347	1,081,220	...
Percent of total Hispanics	100.0	100.0	...	62.1	55.7	...	11.5	11.4	...
Expenditure category									
Total expenditures	100.0	100.0	0.0	100.0	100.0	0.0	100.0	100.0	.0
Food at home	99.1	99.4	.3	99.6	99.7	.1	99.3	99.0	–.3
Housing (excluding vacation and pleasure trips)	99.9	99.7	–.2	99.9	99.8	–.1	100.0	99.6	–.4
Shelter and utilities	99.7	99.5	–.2	99.8	99.5	–.3	99.8	99.6	–.2
Other housing	67.4	67.7	.3	69.3	68.7	–.6	57.1	66.2	9.1
Apparel and services ...	88.7	84.1	–4.6	89.4	86.4	–3.0	81.6	84.0	2.4
Transportation (excluding vacation and pleasure trips)	93.1	92.2	–.9	94.6	94.0	–.6	83.1	85.8	2.7
Private	83.5	84.3	.8	89.9	89.0	–.9	58.7	68.9	10.2
Public (excluding vacation and pleasure trips)	21.0	16.6	–4.4	14.9	12.3	–2.6	36.0	28.4	–7.6
Health care	61.7	65.4	3.7	62.5	62.2	–.3	55.3	63.8	8.5
Health insurance	43.3	46.6	3.3	42.9	41.7	–1.2	45.2	47.2	2.0
Medical services	35.8	35.9	.1	36.7	36.4	–.3	25.3	32.6	7.3
Prescription drugs ...	26.2	30.9	4.7	25.5	30.8	5.3	21.0	29.7	8.7
Medical supplies	6.3	7.6	1.3	6.1	7.2	1.1	6.4	6.4	.0
Recreation and related expenditures ..	91.8	92.4	0.6	92.4	92.5	.1	90.8	94.0	3.2
Food away from home	75.6	74.2	–1.4	77.6	77.6	.0	65.7	68.4	2.7
Entertainment	81.7	83.7	2.0	82.7	82.9	.2	79.8	87.6	7.8
Reading	46.4	33.6	–12.8	44.6	32.1	–12.5	52.3	38.8	–13.5
Transportation (on trips)	9.7	8.9	–.8	7.9	7.7	–.2	12.5	10.1	–2.4
Other lodging	12.0	11.0	–1.0	12.0	10.7	–1.3	9.1	10.2	1.1
Other	95.0	95.6	.6	96.4	96.7	.3	90.4	90.7	.3
Alcohol	36.8	32.7	–4.1	38.2	33.1	–5.1	26.5	26.7	.2
Tobacco and smoking supplies ..	23.4	19.0	–4.4	21.4	18.1	–3.3	36.0	21.4	–14.6
Education	15.6	15.8	.2	16.0	14.8	–1.2	13.4	15.5	2.1
Personal care	70.1	72.4	2.3	71.9	72.7	.8	56.0	64.2	8.2
Cash contributions ...	38.7	38.5	–.2	35.2	38.0	2.8	32.6	30.5	–2.1
Personal insurance ..	80.5	78.6	–1.9	84.1	82.8	–1.3	67.2	67.2	.0
Miscellaneous	39.3	38.5	–.8	40.8	38.0	–2.8	26.0	32.5	6.5

See footnote at end of table.

portation (12.5 percent). Each group experienced increases in private transportation expenditures, ranging from 28 percent for other Spanish families to 68 percent for Cuban families. However, public transportation (excluding vacation and pleasure trips) shows big differences within the Hispanic community. Although on average these expenditures were unchanged in nominal terms, these expenditures fell substantially for Central or South American families (17 percent), other Spanish families (55 percent), and Cuban

families (64 percent). These expenditures rose for Puerto Rican families (6 percent) and Mexican families (56 percent). When examining percent reporting, all groups have lower figures for public transportation in 2000–01 than for that in 1994–95. Despite a fairly large decline in expenditures by Central or South American families (17 percent), this group had the smallest decline in percent reporting (1 percentage point). However, both Cuban (18 percentage points) and other Spanish families (15 percentage points) experienced large

Table 5. Continued—Percent reporting expenditures for Hispanics by geographic origin of the reference person, 1994–95 and 2000–01

Characteristic	Cuban			Central or South American			Other Spanish		
	1994–95	2000–01	Percentage point change	1994–95	2000–01	Percentage point change	1994–95	2000–01	Percentage point change
Number	357,584	579,773	...	1,049,660	1,390,334	...	651,499	1,150,271	...
Percent of total Hispanics	4.6	6.1	...	13.5	14.6	...	8.4	12.1	...
Expenditure category									
Total expenditures	100.0	100.0	0.0	100.0	100.0	0.0	100.0	100.0	0.0
Food at home	99.3	99.4	.1	97.0	99.2	2.2	99.7	99.0	-.7
Housing (excluding vacation and pleasure trips)	99.5	99.7	.2	99.6	99.9	.3	99.9	99.6	-.3
Shelter and utilities	99.5	99.7	.2	99.0	99.5	.5	99.9	99.6	-.3
Other housing	68.7	67.0	-1.7	70.0	71.1	1.1	63.1	60.4	-2.7
Apparel and services	85.8	77.0	-8.8	91.3	85.1	-6.2	90.4	75.9	-14.5
Transportation (excluding vacation and pleasure trips)	89.0	88.0	-1.0	93.8	92.3	-1.5	96.2	91.8	-4.4
Private	77.1	84.3	7.2	79.5	77.9	-1.6	79.9	85.5	5.6
Public (excluding vacation and pleasure trips)	28.3	10.8	-17.5	28.8	27.7	-1.1	29.6	14.9	-14.7
Health care	76.2	78.2	2.0	57.3	64.1	6.8	64.2	76.6	12.4
Health insurance	66.8	66.8	.0	32.7	45.0	12.3	48.0	60.2	12.2
Medical services	31.8	28.4	-3.4	39.7	35.3	-4.4	39.5	41.4	1.9
Prescription drugs	39.0	29.2	-9.8	26.0	26.8	.8	31.4	38.2	6.8
Medical supplies	7.0	6.8	-.2	6.4	6.8	.4	6.9	12.4	5.5
Recreation and related expenditures	84.1	90.7	6.6	93.3	91.9	-1.4	90.5	92.1	1.6
Food away from home	67.3	67.0	-.3	78.1	75.0	-3.1	75.6	66.6	-9.0
Entertainment	71.1	84.4	13.3	81.0	82.6	1.6	83.7	85.1	1.4
Reading	43.1	27.1	-16.0	46.2	29.8	-16.4	54.3	43.1	-11.2
Transportation (on trips)	10.3	11.6	1.3	12.4	12.0	-.4	14.7	8.1	-6.6
Other lodging	9.8	12.8	3.0	13.0	11.3	-1.7	16.2	11.8	-4.4
Other	92.5	95.6	3.1	94.3	95.5	1.2	93.6	95.3	1.7
Alcohol	37.2	31.4	-5.8	36.8	34.6	-2.2	40.4	34.4	-6.0
Tobacco and smoking supplies	18.9	23.6	4.7	19.4	17.8	-1.6	29.8	19.6	-10.2
Education	15.3	13.9	-1.4	18.0	19.7	1.7	12.0	17.3	5.3
Personal care	79.3	76.6	-2.7	68.5	73.5	5.0	73.7	75.6	1.9
Cash contributions ¹	72.6	29.6	-43.0	48.9	43.7	-5.2	43.0	47.1	4.1
Personal insurance	68.6	65.2	-3.4	81.3	81.7	.4	77.9	73.2	-4.7
Miscellaneous	34.9	46.0	11.1	38.8	38.3	-.5	49.5	42.9	-6.6

¹ Prior to the second quarter of 2001, cash contributions were only collected during the fifth interview. Therefore, the percent reporting shown here is for fifth interview consumer units only.

declines in percent reporting, concomitant with large declines in expenditures.

Although expenditures for health care rose about 21 percent for all Hispanics, only Central or South American families (18.2 percent) were very close to the increase in the CPI for medical care (18.5 percent). Puerto Rican families had the next highest increase (16.5 percent), followed by Mexican families (12.1 percent). In contrast, expenditures by other

Spanish families rose much faster (53.6 percent) than the CPI for medical care. There is no clear pattern within the components to suggest why this would be. For example, health insurance expenditures rose dramatically for Central or South American families (89 percent), while expenditures for medical services fell sharply (25 percent). Although this may be an indication that Central or South American families were purchasing health insurance to cover medical service costs,

Table 6. Average annual expenditure shares for Hispanics by geographic origin of the reference person, 1994–95 and 2000–01

Expenditure category	Expenditure shares (in percent)											
	Total Hispanics		Mexican		Puerto Rican		Cuban		Central or South American		Other Spanish	
	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01
Number	7,791,811	9,491,476	4,835,721	5,289,878	897,347	1,081,220	357,584	579,773	1,049,660	1,390,334	651,499	1,150,271
Percent of total Hispanics	100.0	100.0	62.1	55.7	11.5	11.4	4.6	6.1	13.5	14.6	8.4	12.1
Total expenditures ...	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Food at home	15.1	13.3	15.3	14.0	17.5	14.2	14.1	11.1	13.7	12.3	14.2	11.9
Housing (excluding vacation and pleasure trips) ..	33.4	33.4	32.1	31.9	36.8	37.4	31.7	37.6	37.3	35.3	32.3	31.1
Shelter and utilities	29.0	28.6	27.5	27.4	32.3	32.9	26.5	32.0	33.5	30.0	28.2	26.5
Other housing	4.5	4.7	4.6	4.5	4.5	4.5	5.2	5.5	3.8	5.3	4.2	4.6
Apparel and services	5.0	4.3	5.3	4.5	4.9	4.8	3.4	3.1	4.5	4.0	4.7	4.3
Transportation (excluding vacation and pleasure trips)	18.6	21.6	20.2	23.7	12.7	16.4	17.0	19.7	17.0	19.3	18.6	21.5
Private	18.1	21.3	20.0	23.4	11.9	15.6	16.4	19.5	16.1	18.7	17.8	21.2
Public (excluding vacation and pleasure trips) .....	.5	.4	.2	.3	.9	.8	.6	.1	.9	.6	.8	.3
Health care	3.9	3.8	3.9	3.6	3.6	3.6	5.1	4.5	3.6	3.3	3.7	5.3
Health insurance	1.9	2.0	2.0	1.8	2.2	2.1	3.3	2.7	1.1	1.7	2.0	3.0
Medical services	1.5	1.2	1.5	1.2	.9	.9	1.2	1.2	2.1	1.2	1.3	1.3
Prescription drugs .....	.3	.5	.3	.5	.3	.5	.5	.5	.2	.3	.3	.6
Medical supplies .....	.1	.2	.1	.1	.2	.1	.1	.1	.1	.1	.1	.3
Recreation and related expenditures ...	8.9	8.8	8.5	8.6	9.4	9.4	10.4	9.1	9.2	8.5	10.0	9.2
Food away from home ...	3.6	3.5	3.6	3.7	3.2	3.3	4.2	3.1	3.8	3.4	3.3	3.5
Entertainment	3.8	3.8	3.7	3.8	4.0	4.1	4.2	3.8	3.4	3.2	4.5	4.2
Reading .....	.3	.2	.3	.2	.4	.2	.4	.2	.4	.2	.4	.3
Transportation (on trips) .....	.8	.7	.5	.5	1.1	.9	1.0	1.1	1.0	1.1	1.2	.6
Other lodging .....	.5	.6	.4	.4	.7	.9	.6	.9	.6	.7	.6	.7
Other	15.1	15.7	14.7	14.8	15.2	14.8	18.4	15.8	14.8	17.9	16.5	17.5
Alcohol .....	.7	.7	.8	.7	.5	.6	.9	.7	.7	.7	.6	.7
Tobacco and smoking supplies .....	.6	.6	.5	.5	1.3	1.0	.5	.7	.4	.4	.7	.7
Education	1.1	1.1	.7	.7	1.8	1.3	1.7	1.1	1.9	1.7	1.1	1.7
Personal care .....	.8	.8	.8	.7	.8	.8	1.3	.8	.9	.8	.9	.9
Cash contributions	1.7	2.2	1.6	1.9	1.3	1.8	3.8	1.6	1.5	3.9	1.8	2.0
Personal insurance	8.1	8.7	8.0	8.7	7.8	8.1	7.8	8.7	7.7	8.5	9.9	9.7
Miscellaneous	2.1	1.6	2.3	1.5	1.7	1.2	2.4	2.3	1.7	1.8	1.5	1.8

apparently, they did not achieve as much success in prescription drug coverage, as these expenditures rose 69 percent—more than the increase for Puerto Rican families (54 percent) or Cuban families (20 percent). In contrast, expenditures for health insurance rose 61 percent for other Spanish families, while expenditures for medical services rose 13 percent, and prescription drug expenditures rose 100 percent for these consumer units. The percent reporting does not add much clarity to the situation. The percent reporting health insurance was relatively stable for Mexican (1-percentage point decrease), Puerto Rican (2-percentage point increase), and Cuban families (no change). The percent reporting rose substantially for Central or South American and other Spanish families (12 percentage points in each case). However, percent reporting medical services decreased for Central or South American families (4 percentage points), while it increased for other Spanish families (2 percentage points).

Expenditure shares. Another way to analyze expenditure patterns is to examine expenditure shares, or the proportion of total expenditures allocated to specific goods and services by the average family. Expenditure shares control for price changes, at least to some extent; if expenditures for a specific item increase over time, it may be due to increased consumption or increased prices, as stated before. However, if all prices double, and quantities purchased remain the same, then expenditures will double but shares will remain the same. As evidenced earlier in this article, inflation is rarely “pure”—that is, affecting all items in the same way. Still, expenditure shares provide an idea of how consumption is changing in a relative framework. Regardless of price levels, differences in shares may indicate different consumption patterns for groups. One method of analyzing these changes was developed by Prussian economist Ernst Engel in the 19th century. According to Engel’s Proposition of 1857, as income increases, the proportion of total expenditures allocated to food decreases. Also, Engel found that shares allocated to housing and apparel stay roughly constant as income increases, while shares allocated for “luxury goods” increase.¹⁵ Engel’s findings can be used to analyze economic standing of different groups within the same time period, or the same group across time periods. For example, if the share of total expenditures allocated to food has decreased for a specific group over time, presumably, it is not because they are eating less food, but rather because prices for food have fallen, or incomes have risen (or both). Either way, this leaves more income for the group to allocate to other expenditures, and allows them to increase consumption or savings without giving up any food.

According to the type of analysis Engel performed, Hispanics are better off in 2000–01 than they were in 1994–95. As a group, the share of total expenditures allocated to food at home declined from 15 percent to 13 percent (table 6). The smallest change in percentage points was for Mexican

families, whose share decreased from 15.3 percent of total expenditures to 14.0 percent. The largest change in percentage points was for Puerto Ricans, whose share decreased from 17.5 percent to 14.2 percent.

Consistent with Engel’s findings, the shares allocated to apparel and services and housing were stable for all groups, with the exception of Cuban families. For these consumers, the share of total expenditures allocated to housing rose substantially, from 32 percent to 38 percent. This was nearly all accounted for by an increase in the share allocated to shelter and utilities, which rose from 27 percent to 32 percent. Similarly, expenditures for health care were stable for all groups; the largest change was for other Spanish families, in which case the share rose from 3.7 percent to 5.3 percent of total expenditures. Perhaps surprisingly, shares for recreation and related expenditures also held steady. This is not only true at the aggregate level, but also for all subcomponents for all groups.

Finally, according to Engel’s analysis, transportation appears to be a luxury good, as shares for all groups increase notably. For Hispanics in general, the share rose from 19 percent to 22 percent of total expenditures. Of course, this expenditure category is dominated by private transportation. Again, for each group, private transportation shares rose. The smallest increase was for Central or South American families (16.1 to 18.7 percent), while the largest was for Puerto Rican families (11.9 to 15.6 percent).

Regression analysis

As described, differences in expenditure patterns are observed across Hispanic groups. Some of these differences may be due to differences in tastes and preferences across the groups. However, table 2 shows that there are also demographic differences across groups. Differences in income, age, or other characteristics can also influence expenditure patterns. To help discern what differences may be due to demographic differences and what differences may be due to underlying differences in tastes and preferences by geographic origin, regression analysis is used. As described in the previous work that this study updates,¹⁶ regression analysis allows the user to estimate how (in this case) differences in geographic origin might be related to differences in expenditures, *ceteris paribus* (that is, given that all other characteristics are held constant). As with the previous work, major expenditure categories (food at home, shelter and utilities,¹⁷ apparel and services, transportation excluding vacation and pleasure trips, and recreation and related expenditures) are examined using ordinary least squares regression. The “other” expenditures category is omitted from the analysis, despite constituting a substantial share of total expenditures, because it is composed of an eclectic mixture of goods and services. It is not clear what the meaning of the results of this regression would be at the

Table 7. Standardized results: Marginal propensity to expend (MPE) and permanent income elasticity by Hispanic group and expenditure category, 1994–95 and 2000–01

Expenditure category	Mexican		Puerto Rican		Cuban		Central or South American		Other Spanish	
	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01
Total expenditures	\$24,911	\$30,651	\$24,911	\$30,651	\$24,911	\$30,651	\$24,911	\$30,651	\$24,911	\$30,651
Food at home	3,761	4,063	3,761	4,063	3,761	4,063	3,761	4,063	3,761	4,063
Marginal propensity to expend	0.034	¹ 0.040	² 0.055	0.044	0.045	0.046	² 0.061	¹ 0.040	0.038	0.041
Permanent income elasticity	0.228	0.299	0.363	0.334	0.299	0.344	0.406	0.303	0.252	0.310
Shelter and utilities	7,216	8,779	7,216	8,779	7,216	8,779	7,216	8,779	7,216	8,779
Marginal propensity to expend	0.145	¹ 0.151	² 0.189	² 0.201	0.120	^{1,2} 0.186	² 0.183	² 0.171	0.164	0.149
Permanent income elasticity	0.501	0.526	0.654	0.703	0.416	0.651	0.633	0.596	0.531	0.520
Apparel and services	1,246	1,322	1,246	1,322	1,246	1,322	1,246	1,322	1,246	1,322
Marginal propensity to expend	0.073	0.057	² 0.093	0.065	² 0.049	0.057	0.069	0.060	0.086	² 0.070
Permanent income elasticity	1.467	1.319	1.862	1.517	0.976	1.316	1.373	1.387	1.727	1.633
Transportation (excluding vacation and pleasure trips)	4,632	6,629	4,632	6,629	4,632	6,629	4,632	6,629	4,632	6,629
Marginal propensity to expend	0.268	0.320	² 0.386	² 0.403	² 0.341	² 0.405	0.254	0.343	² 0.168	² 0.258
Permanent income elasticity	1.443	1.481	2.074	1.865	1.833	1.870	1.367	1.586	0.903	1.191
Recreation and related expenditures	2,219	2,684	2,219	2,684	2,219	2,684	2,219	2,684	2,219	2,684
Marginal propensity to expend	0.143	0.144	0.157	0.129	² 0.184	0.159	0.142	0.140	0.150	0.148
Permanent income elasticity	1.611	1.641	1.766	1.478	2.063	1.814	1.593	1.602	1.689	1.695

¹ Income coefficient is statistically significantly different from 1994–95 at the 90-percent confidence level; see table 8 for more information.

² Income coefficient is statistically significantly different from Mexican consumers at the 90-percent confidence level; see table 8 for more information.

aggregate level, and the individual components are too infrequently reported to warrant separate analysis.

Description of variables. In addition to the expenditures described (that is, the dependent variables), several independent variables are used in these regressions. Most are common to all regressions. Consistent with the previous work, these variables include: total expenditures, age (and age squared) of reference person, number of adults (and number squared), number of children¹⁸ (and number squared), and dummy variables describing the reference person's family type (single person, husband and wife only, single parent, or other family), region of residence (Northeast, Midwest, or West), degree of urbanization (rural), education (less than high school graduate, some college, or college graduate), and working status (self-employed, retired, or not working for reasons other than retirement). The "omitted" categories for these dummy variables include: husband and wife with children (family type), South (region of residence), urban (degree of urbanization), high school graduate (education), and wage and salary earner (working status). These variables are omitted, as is traditional when dummy variables are employed, to avoid perfect multicollinearity.

In updating the previous work, two new binary variables are added: Black and other race. (The omitted category is White.) In the previous work, race did not differ substantially across Hispanic groups. Only two—Central or South American (7.4 percent) and other Spanish (10.4 percent) had substantially more than 5 percent reporting "Black" for race

of the reference person. (Cuban families had 5.3 percent reporting, but they were the smallest Hispanic group in 1994–95.) For "other race," all groups reported less than 2 percent, and two groups (Cuban and other Spanish) had no reports for reference person of "other race." However, as mentioned earlier, the sample is larger in 2000–01 than 1994–95, thus providing more observations for families whose reference person is Black or "other race." Additionally, the percentage that report Black for race of reference person has increased for all Hispanic groups except other Spanish (for whom it declined), and each group has at least some reports of "other race." Because the Hispanic groups are now less homogenous by race, and because homogeneity may continue to decrease in the future, race is now added to the regression analysis. The 1994–95 regression results reported in this work include this variable as well as the 2000–01 results.

In addition, a few independent variables are included only in selected regressions. For example, the housing regression contains dummy variables describing housing tenure (owned with no mortgage or renter; owned with mortgage is omitted) and continuous variables describing size of dwelling (number of rooms, bedrooms, bathrooms, and half-baths).¹⁹ The regressions for transportation and recreation and related expenditures also contain variables describing number of automobiles and other vehicles owned by the consumer unit. These variables are selectively included because in each case, they will clearly affect expenditures for the dependent variable under study, but do not necessarily directly affect other expenditures. (For example, number of bedrooms will clearly affect housing expenditures,

Table 8. Statistical significance of coefficient changes over time by Hispanic group and selected expenditure categories, 1994–95 and 2000–01

Expenditure category	Mexican		Puerto Rican		Cuban		Central or South American		Other Spanish	
	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01	1994–95	2000–01
Total expenditures	\$24,911	\$30,651	\$24,911	\$30,651	\$24,911	\$30,651	\$24,911	\$30,651	\$24,911	\$30,651
Food at home	3,761	4,063	3,761	4,063	3,761	4,063	3,761	4,063	3,761	4,063
Different intercept than Mexicans .....	...	...	99	(¹)	(¹)	(¹)	99	(¹)	(¹)	(¹)
Different MPE than Mexicans .....	...	...	99	(¹)	(¹)	(¹)	99	(¹)	(¹)	(¹)
Different intercept than own group 1994–95 .....	...	95	...	(¹)	...	(¹)	...	95	...	(¹)
Different MPE than 1994–95 .....	...	99	...	(¹)	...	(¹)	...	90	...	(¹)
Shelter and utilities	7,216	8,779	7,216	8,779	7,216	8,779	7,216	8,779	7,216	8,779
Different intercept than Mexicans .....	...	...	99	99	(¹)	99	99	90	(¹)	(¹)
Different MPE than Mexicans .....	...	...	99	99	(¹)	99	99	95	(¹)	(¹)
Different intercept than own group 1994–95 .....	...	(¹)	...	(¹)	...	99	...	(¹)	...	(¹)
Different MPE than 1994–95 .....	...	95	...	(¹)	...	99	...	(¹)	...	(¹)
Apparel and services	1,246	1,322	1,246	1,322	1,246	1,322	1,246	1,322	1,246	1,322
Different intercept than Mexicans .....	...	...	95	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	95
Different MPE than Mexicans .....	...	...	90	(¹)	90	(¹)	(¹)	(¹)	(¹)	95
Different intercept than own group 1994–95 .....	...	(¹)	...	(¹)	...	(¹)	...	(¹)	...	(¹)
Different MPE than 1994–95 .....	...	(¹)	...	(¹)	...	(¹)	...	(¹)	...	(¹)
Transportation (excluding vacation and pleasure trips)	4,632	6,629	4,632	6,629	4,632	6,629	4,632	6,629	4,632	6,629
Different intercept than Mexicans .....	...	...	99	99	95	99	(¹)	(¹)	99	99
Different MPE than Mexicans .....	...	...	99	99	95	99	(¹)	(¹)	99	99
Different intercept than own group 1994–95 .....	...	(¹)	...	(¹)	...	(¹)	...	90	...	90
Different MPE than 1994–95 .....	...	(¹)	...	(¹)	...	(¹)	...	(¹)	...	(¹)
Recreation and related expenditures	2,219	2,684	2,219	2,684	2,219	2,684	2,219	2,684	2,219	2,684
Different intercept than Mexicans .....	...	...	(¹)	(¹)	95	(¹)	(¹)	(¹)	(¹)	(¹)
Different MPE than Mexicans .....	...	...	(¹)	(¹)	95	(¹)	(¹)	(¹)	(¹)	(¹)
Different intercept than own group 1994–95 .....	...	95	...	(¹)	...	(¹)	...	(¹)	...	(¹)
Different MPE than 1994–95 .....	...	(¹)	...	(¹)	...	(¹)	...	(¹)	...	(¹)

¹ The difference is not statistically significant at the 90-percent confidence level.

but not food at home expenditures.)

Also important is the inclusion of total expenditures as a proxy for permanent income. This is done for both theoretical and empirical reasons. Theoretically, consumers do not make expenditure decisions based only on income received today (that is, current income), but also on income they expect to receive in the future. This theory, proposed by Milton Friedman, is known to economists as the “permanent income hypothesis.”²⁰ But there are empirical reasons for using permanent income as well. For example, because “permanent” income incorporates expectations of future earnings, there may be less variability in the relationship between expenditures and “permanent” income than “current” income.²¹ Furthermore, current income is not necessarily reported in full by all families, even by so-called complete reporters. Removing “incomplete” reporters reduces sample size, and not even in

a random fashion, because incomplete reporters are not randomly distributed throughout the CE sample.²²

Furthermore, following a general trend in income reporting, the percentage of Hispanic consumer units classified as complete income reporters was lower in 2000–01 than in 1994–95, especially for Cuban, Central or South American, and other Spanish families (table 2). For all these reasons, total expenditures are used as a proxy for permanent income. (For convenience, the term “income” will be used henceforth to mean “permanent income.”)

Model specification. The goal of the regressions is to obtain parameter estimates that can be used to calculate the marginal propensity to expend (MPE) for different goods and services for each Hispanic group in 2000–01, and to compare these results both intra-temporally (for example, Puerto Rican

families to Mexican families in 2000–01) and inter-temporally (for example, Puerto Rican families in 2000–01 to Puerto Rican families in 1994–95). The MPE's are then used to calculate income elasticity for each good or service to see whether or not there are differences in expenditure patterns among Hispanics of different geographic origin. Similarly, following the previous work, these elasticities are estimated for each Hispanic group by using its own mean permanent income (“unadjusted” estimation) or by using the average permanent income for the sample as a whole (“standardized” estimation) in cases where permanent income is needed to estimate these factors.

To achieve these goals accurately, Box-Cox transformations are performed on both the dependent variables and the income variables in each of the equations. These transformations are used to reduce heteroscedasticity. (See appendix for details.) For consistency, the same transformations are applied to the 2000–01 data as were applied to the 1994–95 data in the previous work. Because of the Box-Cox transformations, parameter estimates in most of the models do not have any immediately interpretable intuitive meaning. Therefore, for the reader's convenience, important measures that are derived from these parameter estimates (such as the MPE's and income elasticities, described subsequently) are presented in table 7. Table 8 describes whether the income parameters are different across geographic origin within each time period, and whether the income parameters have changed over time within each geographic origin.

The model, then, is specified as follows:

$$Y^* = \alpha_m + \alpha_m T + \sum \alpha_i D_i + \sum \alpha_i D_i T + \beta_m I + \beta_m IT + \sum \beta_i D_i I + \sum \beta_i D_i IT + \beta_j X_j + \beta_j X_j T + e$$

where

Y^* is the (Box-Cox transformation of the) dependent variable;

α_m is the intercept of the regression equation;

T is a dummy variable describing the time period for the interview (0 for 1994–95; 1 for 2000–01);

α_i are parameter estimates;

D_i are dummy variables describing geographic origin for non-Mexican Hispanics;

β_m, β_i are parameter estimates for the income variable;

I is permanent income (i.e., total expenditures);

β_j is a vector of parameter estimates for various independent variables;

X_j is a vector of independent variables;

e is the error of the regression.

This specification allows relationships for all variables to differ by geographic origin as well as over time, and for statistical tests to be performed to ascertain whether or not

observed differences are statistically significant. In the 1994–95 data, t -tests are sufficient to distinguish whether parameter estimates differ statistically from the reference group to the group in question. For changes over time, F -tests are used.²³

Because Mexicans are the largest segment of the Hispanic population, it is with reference to them that statistically significant differences are examined. While it is possible to test each group against each other (for example, are Cubans statistically significantly different from Puerto Ricans), such comparisons would be cumbersome with five groups, especially when comparing across years. Because the main point of this section is to test whether Hispanics are homogeneous or not in 2000–01, and whether expenditure patterns have changed over time for each group, this specification provides sufficient information.

Results. There are two ways to analyze the regression results: in “unadjusted” and “standardized” forms. Here the unadjusted results show the estimated MPE and elasticity for each good, assuming that they are purchased by the “average” Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish family. The standardized figures use average expenditures and permanent income from all Hispanic families. Therefore, the standardized results, presented in table 7, are analyzed here. They are the closest to *ceteris paribus* assumptions: That is, the MPE's and elasticities can only differ if the income parameter estimate differs across geographic origin. With the unadjusted results, it is possible that Engel curves are identical for two groups, but they still have different MPE's and elasticities because the average member of each group is on a different point of the same Engel curve. Therefore, it is more difficult to isolate reasons for differences in the unadjusted results. For this reason, the standardized results are described in this section. However, the unadjusted results are presented in the appendix because they may be of interest to readers who need information on MPE's and elasticities for each group, but who are not concerned with why the differences occur—that is, whether they are the result of differences in income, or the reflection of different tastes and preferences in the different groups. Consistent with the previous work, in this study, the unadjusted and standardized results are not largely different.

According to the regression results, expenditure patterns differ across Hispanic subgroups, although the differences are not entirely consistent with those found in 1994–95. For example, in 1994–95, both Puerto Rican and Central or South American families were found to have different intercepts and income coefficients for food at home than Mexican families. These differences were statistically significant at the 99-percent confidence level. However, in 2000–01, neither group is found to differ in a statistically significant way from Mexican families, indicating homogeneity by origin for food at home expenditures. Another example of inconsistency is

that other Spanish families were not statistically significantly different from Mexican families in their apparel and service expenditures in 1994–95, but they are different in 2000–01. In some cases, though, the differences are consistent across time. For example, Puerto Rican families are found to be significantly different from Mexican families in their transportation expenditures; in each time period tested, both the intercept and income coefficient differ statistically at the 99-percent confidence level. And for Cuban families, the difference has become more significant—rising from 95 percent confidence in 1994–95 to 99 percent confidence in 2000–01 for both the intercept and income coefficient.

Perhaps of more interest is whether changes within groups have taken place over time. That is, do Mexican families (and all other groups) in 2000–01 still have the same intercept and income coefficients that they had for food at home (or other expenditures) in 1994–95? In many cases, changes are observed over time for one or more groups of Hispanic consumers.

For food at home, Mexican consumers have experienced a change in both the intercept and slope of their Engel curves. The change in the slope means that MPE, and therefore, elasticity, have changed over time. The MPE has risen from 3 cents to 4 cents, and the elasticity has risen from 0.23 to 0.30. Central or South American families have had the opposite experience—the MPE has fallen from 6 cents to 4 cents, and elasticity has fallen from 0.41 to 0.30.

For shelter and utilities, the coefficient for income for Mexican families increased by a statistically significant amount, but it had little effect on the estimated MPE or elasticity. However, for Cuban families, both changed substantially. The MPE rose from 12 cents to 19 cents; the elasticity rose from 0.42 to 0.65. This may be related to the change in housing tenure observed for Cuban families over the study period.²⁴

For the remaining expenditures, no income coefficient changes are significant at the 95-percent confidence level. Although in some cases there appear to be notable changes over time (for example, for Cuban families, the apparel and service elasticity rises from 0.98 to 1.32) the change is not statistically significant, and may be observed by chance.

Summary and conclusions

Previous literature has shown that not only does ethnicity account for substantial variation in consumer expenditures, it has shown that these differences can occur among subgroups of particular ethnicities. In particular, while many researchers treat “Hispanics” as homogenous, previous work finds that there is substantial variation in expenditure patterns by Hispanics of different geographic origin.

This work shows that the Hispanic population is worth revisiting. The percentage of the population accounted for

by Hispanic consumers continues to increase at a substantial pace. In addition, the composition of the Hispanic population has changed even in the few years since the previous work was published. For example, although Mexican families are still the majority of Hispanic families, they account for a smaller portion of the total in 2000–01 than in 1994–95, in large part ceding ground to families of “other Spanish” origin. Given these changes, it is important to see whether expenditure patterns have changed at the aggregate level and, if so, whether or not the changes are due solely to changes in composition of the Hispanic population, or are at least in part caused by underlying changes in tastes and preferences of the groups under study. (These changes could be caused by changes in the groups themselves; for example, immigrants arriving from Mexico between 1994–95 and 2000–01 might have different tastes and preferences than those who were here prior to 1994. Unfortunately, because no data on length of residency in the United States are collected by the Consumer Expenditure Survey, it is not possible to precisely identify the cause of the differences.)

Some demographic characteristics, such as age of reference person, have not changed much over the study period for Hispanics. However, others, such as educational attainment, appear to have changed. Some of these changes may explain higher levels of total expenditures in 2000–01, which for Mexican, Cuban, and Central or South American families rose faster than inflation. For other Spanish families, total expenditures also increased, but at a slower rate than inflation. Despite these changes, though, most Hispanic families in the aggregate account for approximately their population share of total expenditures in the economy. (For example, Mexicans account for 56 percent of Hispanic consumer units and 54 percent of total consumer expenditures by Hispanics.)

Analysis of expenditure shares indicates that Hispanics, in general, are spending a smaller proportion of their dollars on food at home, which means they have a larger share to spend on other goods and services. Given that food at home is a necessity good, this suggests that Hispanics are a bit better off economically in 2000–01 than they were in 1994–95.

Finally, regression analysis is performed to estimate whether changes observed in expenditures are due to changes in income or other similar factors, or to changes in underlying preferences. As with the earlier study, substantial variation is observed across geographic origins. However, over time, only a few changes have occurred. As explained in the main text, it is difficult to control completely for price changes in performing these analyses, so these results should be interpreted cautiously.

This work shows that Hispanic consumers continue to be an important segment of total consumer expenditures in the United States. It also shows that expenditure patterns continue to differ by geographic origin, at the same time geographic origin is changing within the Hispanic community. Given

these changing characteristics and the increasing proportion of the population for which the Hispanic community accounts, it is important to continue to monitor these groups to obtain a better understanding of the patterns in consumer spending and predicting what shapes they may take in the future. □

Notes

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¹ U.S. Bureau of the Census, *Statistical Abstract of the United States: 2001*, p. 17, table 15, available on the Internet at: <http://www.census.gov/prod/2002pubs/01statab/pop.pdf>.

² More information on consumer spending by Hispanics, is available onand <http://www.bls.gov/cex/2000/Standard/tenracar.pdf>. However, comparable tables of consumer spending by Hispanics are not available at this site prior to 1994.

³ For examples, see Janet Wagner and Horacio Soberon-Ferrari, "The Effect of Ethnicity on Selected Household Expenditures," *The Social Science Journal*, February 1990, pp. 181–98; and Geoffrey D. Paulin, "A growing market: expenditures by Hispanic consumers," *Monthly Labor Review*, March 1998, pp. 3–21.

⁴ Paulin, "A growing market."

⁵ Geoffrey D. Paulin, "Variation in Food Purchases: A Study of Inter-Ethnic and Intra-Ethnic Group Patterns Involving the Hispanic Community," *Family and Consumer Sciences Research Journal*, vol. 29, no. 4, June 2001, pp. 336–381.

⁶ A consumer unit is defined as members of a household related by blood, marriage, adoption, or other legal arrangement; a single person living alone or sharing a household with others but who is financially independent; or two or more persons living together who share responsibility for at least two out of three major types of expenses— food, housing, and other expenses. In this article, the terms *consumer unit*, *family*, and *household* are used interchangeably for convenience.

⁷ These data describing consumer units are obtained from the Interview component of the Consumer Expenditure Survey. The weights for this survey are updated periodically using data obtained from the Census Bureau. In addition to using later information in computing the revised weights, the methodology for constructing the weights changed for processing the 1997 and later data. (See *BLS Handbook of Methods*, Chapter 16, http://www.bls.gov/opub/hom/homch16_c.htm.) For these reasons alone, one might expect to see differences in outcomes for 1994–95 data, which were processed using the old weighting scheme, and the 2000–01 data, processed using the revised weighting scheme. In addition, the sample size increased in 1999, as described subsequently in the text. However, data from the U.S. Bureau of the Census (based on the Current Population Survey) also shows that the Hispanic community is changing. The results, in fact, are similar to those shown in table 1, at least for overall growth rates. Using population, rather than consumer unit, figures, the Census data show that the non-Hispanic population increased 6 percent from 1995 to 2000, compared with 19 percent for the Hispanic population. They also show that each Hispanic ethnic group increased faster than the non-Hispanic population: 21 percent for Mexican origin; 8 percent for Puerto Rican origin; 12 percent for Cuban origin; 29 percent for Central or South American origin; and 7 percent for other Spanish origin. (For 1995 data, see U.S. Bureau of the Census, *Statistical Abstract of the United States: 1996*, p. 51, table 53,

<http://www.census.gov/prod/2/gen/96statab/pop.pdf>; for 2000 data, see U.S. Bureau of the Census, *Statistical Abstract of the United States: 2001*, p. 43, table 41, <http://www.census.gov/prod/2002pubs/01statab/pop.pdf>) Some of the differences between the Consumer Expenditure Survey and Census data may lie in the fact that the first set is based on numbers of consumer units, and the second set is based on individual members of the population; if one community has a large influx of single-person immigrants, for example, and the established community is comprised of multi-member families, the number of consumer units may increase dramatically, while the population for the group does not rise so rapidly. Additionally, there are differences in methodologies for calculating the figures used by the different sources. (For example, the Consumer Expenditure Survey weights are not computed using ethnic origin, but the Current Population Survey weights do use ethnic origin; see *BLS Handbook of Methods*, Chapter 1, http://www.bls.gov/opub/hom/homch1_g.htm.) Nevertheless, each shows that the Hispanic population is changing dramatically, and indicates usefulness in examining these groups once again.

⁸ Paulin, "A growing market."

⁹ A report describing the 1998–99 survey results indicates that the "Interview survey collects detailed data on an estimated 60 percent to 70 percent of total household expenditures. Global estimates, that is, expense patterns for a 3-month period, are obtained for food and other selected items, accounting for an additional 20 percent to 25 percent of total expenditures." See *Consumer Expenditure Survey 1998–99*, Report 955 (Bureau of Labor Statistics, November 2001), p. 272.

¹⁰ The first person identified when the respondent is asked who is responsible for owning or renting the home. In this study, the reference person is assumed to be the parent in all cases.

¹¹ "Mexican" origin includes reference persons identified as Mexican; Mexican-American; and Chicano. "Central or South American" origin may include reference persons from Brazil, French Guyana, or other areas where the official language is not Spanish. The Consumer Expenditure Survey only asks whether the reference person is of "Central or South American" origin, and does not allow for finer distinctions. Similarly, "other Spanish" could include persons with familial ties to Spain, Caribbean islands other than Puerto Rico or Cuba (such as the Dominican Republic), or other areas. It is important to note these differences, because changes over time in these groups (Central and South American as well as other Spanish) may be due to changes in the underlying composition of these groups, which are not detectable in the Consumer Expenditure Survey.

¹² In general, complete income reporters are defined as consumer units for which the respondent reports at least one major source of income for the consumer unit, such as wages and salaries, self-employment income, or Social Security income. However, even complete income reporters do not necessarily provide a full accounting of income from all sources.

¹³ Data from the U.S. Immigration and Naturalization Service confirm that patterns of immigration have changed for Central Americans. According to data presented in the *U.S. Statistical Abstracts* (1996, table 8; and 2002, table 7) immigration from Central America rose from 39,900 in 1994 to 66,400 in 2000; an increase of 66 percent. By far, the largest increase is for immigrants from Nicaragua. In 1994, approximately 5,300 immigrants arrived from this country. In 2000, the number increased to 24,000; an increase of 353 percent. In addition, the proportion of immigrants from Central America for which Nicaraguans accounted rose from 13 percent to 36 percent—that is, from fewer than 1 in 7 to more than 1 in 3. Immigrants from El Salvador, who had accounted for the largest proportion—44 percent—in 1994, dropped to second place in 2000—34 percent. Nevertheless, the only group for which the number of immigrants actually declined

was for Panama. There were 2,400 immigrants from this country in 1994 compared to 1,800 in 2000.

Although the data for South American immigrants are limited on these tables, they show that total immigration from South America rose 18 percent over this time, from 47,400 immigrants in 1994 to 56,100 in 2000. (When immigrants from Brazil and Guyana—the two non-Spanish speaking countries for which data are available—are excluded, the increase is 23 percent.) Data for other Spanish are even less available, although immigration from the Dominican Republic declined substantially, from 51,200 in 1994 to 17,500 in 2000.

For more information on immigration patterns from these areas, see the *U.S. Statistical Abstracts*.

¹⁴ Paulin, “Variation in Food Purchases,” 2001.

¹⁵ Louis Philips, *Applied Consumption Analysis* (Amsterdam, Elsevier Science Publishers B.V.; distributed in the U.S. and Canada by Elsevier Science Publishing Company, Inc. of New York, NY), p. 103.

¹⁶ Paulin, “A growing market.”

¹⁷ Shelter and utilities is analyzed instead of total housing because shelter (largely, rent and mortgage interest payments) and utilities constitutes the basic expenditures most families would incur on a recurring basis.

¹⁸ In this case, children are defined as persons under 18 years old. In the Consumer Expenditure Survey, they are defined as the offspring of the reference person. It is possible that a person under 18 is not the offspring of the reference person. This may be because the reference person is the grandparent, aunt or uncle, or some other relative of the person under 18. It may also be that the person under 18 is the reference person—for example, a 17-year-old college student might be included in the sample. By the same token, number of adults is ascertained by subtracting persons under 18 from total family size. Therefore, in the case of the 17-year-old college student, the consumer unit could have no adults and one child.

¹⁹ There are slightly fewer degrees of freedom for the housing regressions because variables related to size of dwelling are occasionally

missing in the Consumer Expenditure Survey data. However, the number of missing values is small, and the pattern of missingness is presumed to be random, so the omission of these observations should not cause any problems in the analysis.

²⁰ Milton Friedman, *A Theory of the Consumption Function* (Princeton, search, 1957), p. 221.

²¹ Suppose, for example, that one family consistently earns \$20,000 per year, and another one usually earns \$15,000, but for some reason received an unexpected \$5,000 in income during the past year. Even though both families earned \$20,000 in “current” income, they may have very different spending patterns. Note that each will have different “permanent” incomes, because the family receiving the extra transitory income (\$5,000) will realize that this is a one time only event, and adjust spending accordingly.

²² For a detailed discussion of “complete” and “incomplete” reporters, see Geoffrey D. Paulin and David L. Ferraro, “Imputing income in the Consumer Expenditure Survey,” *Monthly Labor Review*, December 1994, pp. 23–31.

²³ Additional tables containing specific results, such as parameter estimates, *t*-statistics, and *F*-statistics are available on the Internet at: <http://www.bls.gov/cex/csxart.htm> or upon request to the author: Paulin_G@bls.gov.

²⁴ The percentage of Cuban families sampled who report “owning with a mortgage” increases substantially from 1994–95 to 2000–01, while the percentage reporting renting their homes decreases substantially. In previous work, Geoffrey D. Paulin finds that homeowners and renters have different tastes and preferences, even when other characteristics are taken into account. This work finds that homeowners have a lower MPE than renters for primary housing and related services, but in that study, primary housing and related services includes household operations and house furnishings and equipment in addition to shelter and utilities, which are studied separately in this article. Therefore, it is difficult to say precisely whether the change in MPE is a direct result of the difference in percent reporting renting versus owning, or due to other factors. See Geoffrey D. Paulin, “A Comparison of Consumer Expenditures by Housing Tenure,” *The Journal of Consumer Affairs*, Summer 1995, pp. 164–198, especially, pp. 174–75.

APPENDIX: Notes on methodology

Box-Cox transformations. The two most important variables (aside from ethnicity) considered in this section are expenditures and income. However, neither of these is often found to have a normal distribution,¹ a problem that can cause biased regression results. One solution is to transform these data so that they are approximately normally distributed. One method that has been used with expenditure data is the Box-Cox transformation.² Perhaps the most frequently cited version is as follows:

$$Y^* = (Y^\lambda - 1)/\lambda$$

where

Y^* is the transformed version of the variable Y is expenditures for a specific good or service (for example, food at home or apparel)
 λ is a parameter.

This version of the equation is most useful in demonstrating two special cases for the value of λ . On the one hand, if λ is one, then no transformation of the independent variable is necessary. (The net result is that Y^* equals $Y - 1$, and subtracting a constant from each observation of Y will not affect the distribution.) On the other hand, if λ approaches zero, then Y^* is approximately equal to the natural log of Y .

Although this specification is useful for deriving the value of Y^* when λ approaches zero, it does not yield an intuitive interpretation when λ takes on any other value.³ However, on the same page of the original article on which they describe this specification, G.E.P. Box and D.R. Cox point out that this equation can be simplified to:

$$Y^* = Y^\lambda$$

This leads to a simple interpretation of both λ and the

equation as a whole. For example, if λ is found to be $\frac{1}{2}$, then the transformed variable is simply the square root of Y . In the regression, then, each value of the dependent value is replaced by its square root, and the regression is performed in the usual way. (Note that at least for the special case where λ equals one, it is even easier to see that no transformation is necessary; Y^* equals Y in this case.)

The obvious question raised is how one calculates the value of λ . Conventionally, this is done by trial and error. Several values for λ are used, and whichever λ yields the model with the lowest mean square error is the selected value. However, this method is extremely time consuming, and nearly impossible when one considers that there are two variables (expenditures AND income) that are being transformed. In this study λ is estimated through a maximum likelihood procedure described by Stuart Scott and Daniel J. Rope, who specifically study transformations of Consumer Expenditure Survey data.⁴ The results of this procedure are shown in the following text tabulation:

<i>Expenditure</i>	<i>Optimal value for λ</i>
Food at home	0.250
Shelter and utilities .....	.250
Apparel and services .....	.125
Transportation (excluding vacation and pleasure trips) .....	.000
Recreation and related expenditures .....	.125
Health care .....	.125

Marginal propensity to expend. One of the most important results that can be derived from the regressions presented is the marginal propensity to expend (MPE).⁵ This term is defined as the percentage of an additional dollar the family would spend on a specific good if given an additional dollar. The MPE is equal to the slope of the Engel curve (that is, expenditures as a function of income for each good or service), and is a critical component of elasticity; each of the elasticities shown in table 5 of the text are derived from the marginal propensity to expend money for the same good.

In most literature, the MPE is referred to as the “marginal propensity to consume” (MPC). In the previous work, in fact, the term “MPC” was used. The reason for the difference in terminology comes from the inter-temporal comparisons. The usual meaning of the term MPC is the change in quantity demanded given a unit increase in income. It can also mean the change in expenditure given a unit increase in income, as noted. However, this is only true assuming prices are constant. To illustrate, suppose that a person regularly purchases apples by the pound. The expenditure for apples can be shown to be:

$$X = PQ$$

Where

X is the expenditure on apples;

P is the price per pound for apples;

Q is the number of pounds of apples purchased.

Suppose further that expenditures are a linear function of income:

$$X = a + bI.$$

According to this equation, if income (I) rises by one dollar, expenditures (X) will increase by b cents. Because the price per pound is fixed for all consumers who shop at the same store (that is, it is not related to income), the only way that X can change in response to an increase in I is because Q changes in response to an increase in I . That is, the higher the income, the more pounds of apples the customer purchases.

During the time frames under study (1994–95 and 2000–01) price changes were fairly small, in general. However, even if year-to-year changes are small, over time, they can add up to large changes in prices across the periods (that is, when comparing 1994–95 to 2000–01). Note that even if I and Q stay the same, X could rise over time simply because P rises over time. (It is even possible for X to rise if P rises by a larger percentage than Q declines.) If price changes affected all goods in exactly the same way, it would be easy to control for these changes when comparing MPES. However, as described in the text, the different goods and services compared experienced different price changes over time; in fact, although most prices rose, prices for apparel and services declined from 1994–95 to 2000–01. None of the price increases studied exactly matched the increase in overall prices. Therefore, relative prices of goods and services will differ over the periods. For example, as noted, prices for apparel and services declined while total prices increased. Therefore, apparel and services are relatively less expensive in 2000–01 than in 1994–95. Similarly, prices for transportation rose at a slower rate (12.5 percent) than all prices (16.2 percent). Although actual prices were higher in 2000–01 for transportation than they were in 1994–95, relative to other goods and services, transportation cost less in 1994–95 than in 2000–01. And because prices for medical care rose faster (18.5 percent) than other prices, medical care was relatively more expensive in 2000–01 than in 1994–95, although its relative increase (that is, its increase compared with other price increases) is not nearly so large as its actual price increase (the aforementioned 18.5 percent). Given that relative prices are different in these time periods, then even given the same income across years, consumers will allocate the dollars differently (for example, they might purchase more apparel and services in 2000–01 than in 1994–95). Even if permanent income is price-adjusted by the change in total prices, different allocations will occur if the price change for the good under study is different than the change in total prices.⁶ That is, because of the change in relative prices, the MPE for each good changes. The reason is that the change in relative prices changes the Engel curve that describes the consumer’s expenditures.⁷

One way to correct for the change in relative prices is to adjust both permanent income by the change in overall prices, and adjust the specific good (that is, food at home) by the change

Table A-1. Unadjusted results: marginal propensity to expend (MPE) and permanent income elasticity by Hispanic group and expenditure category, 1994-95 and 2000-01

Expenditure category	Mexican		Puerto Rican		Cuban		Central or South American		Other Spanish	
	1994-95	2000-01	1994-95	2000-01	1994-95	2000-01	1994-95	2000-01	1994-95	2000-01
Total expenditures	\$24,164	\$29,545	\$23,194	\$27,191	\$25,127	\$35,341	\$28,367	\$36,727	\$27,127	\$29,286
Food at home	3,686	4,127	4,052	3,853	3,535	3,926	3,884	4,524	3,839	3,475
Marginal propensity to expend	0.035	¹ 0.042	² 0.062	0.048	0.043	0.039	² 0.055	¹ 0.036	0.035	0.038
Permanent income elasticity	0.229	0.298	0.357	0.338	0.303	0.347	0.403	0.295	0.250	0.322
Shelter and utilities	6,653	8,102	7,489	8,937	6,651	11,312	9,505	11,028	7,642	7,750
Marginal propensity to expend	0.141	¹ 0.147	² 0.209	² 0.230	0.112	^{1,2} 0.195	² 0.198	² 0.169	0.147	0.142
Permanent income elasticity	0.511	0.536	0.648	0.699	0.424	0.611	0.591	0.563	0.524	0.536
Apparel and services	1,291	1,325	1,125	1,292	848	1,088	1,264	1,481	1,263	1,267
Marginal propensity to expend	0.078	0.059	² 0.091	0.072	² 0.035	0.042	0.061	0.055	0.080	² 0.071
Permanent income elasticity	1.461	1.319	1.886	1.521	1.024	1.349	1.370	1.367	1.724	1.641
Transportation (excluding vacation and pleasure trips)	4,875	6,989	2,950	4,453	4,264	6,958	4,813	7,086	5,058	6,303
Marginal propensity to expend	0.291	0.350	² 0.264	² 0.305	² 0.311	² 0.368	0.232	0.306	² 0.168	² 0.256
Permanent income elasticity	1.443	1.481	2.074	1.865	1.833	1.870	1.367	1.586	0.903	1.191
Recreation and related expenditures ..	2,047	2,529	2,170	2,558	2,617	3,206	2,613	3,137	2,712	2,705
Marginal propensity to expend	0.138	0.142	0.166	0.140	² 0.210	0.161	0.144	0.134	0.165	0.156
Permanent income elasticity	1.627	1.653	1.771	1.487	2.021	1.774	1.561	1.571	1.648	1.693

¹ Income coefficient is statistically different from 1994-95 at the 90-percent confidence level, see table 8 for more information.

² Income coefficient is statistically significantly different from Mexican consumers at the 90-percent confidence level; see table 8 for information.

in its own price. In this case “real” food at home expenditures are regressed on “real” permanent income. The problem with applying this approach is that only two categories under study (food at home and apparel and services) have CPI values that directly match them. For example, there is a CPI for transportation, but it includes airfares and other expenditures for travel on vacation and pleasure trips, which are included in recreation and related expenditures in this study. It is not clear how to either disaggregate these components from the CPI to match the transportation expenditure data, or how to price-adjust the transportation data correctly at the component level and to sum the results.⁸

Nonetheless, the MPE is useful to examine. Within a time period (that is, 1994-95 or 2000-01) the MPE and the MPC can be considered identical, because within the period, all consumers can be assumed to face the same prices. Changes across time periods have to be interpreted cautiously, because they may reflect changes in relative prices rather than actual tastes and preferences. However, some information can still be gleaned by examining the changes as a whole. For example, suppose that the relative price of a good increases, and so does the MPE. This may indicate an underlying change in the tastes and preferences of the group for which this is true. Additionally, if the MPE rises for some groups and falls for others, there may be something happening in at least one of the groups that is not related to price changes, because each group faces the same changes in prices over time.

Empirically, it is also important to point out that the MPE can be derived in two ways. First, it can be derived for the average family in each ethnic group. These are shown in table A-1 as the “unadjusted” MPE’s.⁹ In other words, to

compute the MPE for food at home for Mexican families, income and food expenditures for the average Mexican family are used. Likewise, average income and expenditures for Cuban families are used to compute MPE’s for Cuban families. However, these results by themselves do not tell the whole story; that is, how much of the difference in MPE is attributable to underlying differences across ethnic groups, and how much is attributable to differences in income and expenditures by ethnic groups? To answer this important question, the “standardized” MPE’s are also presented. (See table 7.) That is, the MPE is recalculated for each ethnic group, for a hypothetical family in that group whose income and food at home expenditures happen to match the averages for all Hispanic consumer units. When these factors are held constant, the differences must be due to tastes or other factors captured in the income parameter estimate. An example of the calculation of the “unadjusted” and “standardized” MPE is shown subsequently.

In cases for which the Engel curve is specified in linear terms, the MPE is constant, and is equal to the value of the parameter estimate associated with income. It is estimated through the following regression equation:

$$Y = a + bI + e$$

where

Y is expenditure for the good in question

a is the intercept

b is a parameter estimate

I is “permanent” income

e is the error term.

Using calculus, one can see that

$$\partial Y/\partial I = b$$

and so b is equal to the MPE.

However, in the text, the Engel curves are not specified as a linear function. In all cases except transportation (described in the following), they are specified as:¹⁰

$$Y^\lambda = a + b \ln I + e$$

where

λ is a parameter estimated with a maximum likelihood procedure (see text).

While it is still appropriate to use calculus to find the first derivative of the equation, the chain rule is now needed because Y is a function of λ . Therefore, we make the following substitution:

$$U = Y^\lambda$$

and so

$$U = a + b \ln I + e$$

$$\partial U/\partial I = \partial(a + b \ln I + e)/\partial I$$

$$\partial U/\partial I = \partial U/\partial Y * \partial Y/\partial I \text{ (by the chain rule).}$$

Solving the pieces that are known,

$$\partial U/\partial Y = \lambda Y^{\lambda-1};$$

$$\partial(a + b \ln I + e)/\partial I = b/I;$$

therefore,

$$\partial U/\partial I = \lambda Y^{\lambda-1} * \partial Y/\partial I = b/I$$

$$\partial Y/\partial I = \partial[(Y^\lambda)^{1/\lambda}]/\partial I = \partial[(a + b \ln I + e)^{1/\lambda}]/\partial I = [1/\lambda(a + b \ln I + e)^{1/\lambda - 1}] * b/I$$

$$= [b/I\lambda] * (a + b \ln I + e)^{1/\lambda - 1}$$

$$= [b/I\lambda] * (Y^\lambda)^{1/\lambda - 1}$$

$$= [b/I\lambda] * (Y^\lambda)^{(1 - \lambda)/\lambda}$$

$$= [b/I\lambda] * (Y^{1 - \lambda})$$

or after rearranging,

$$\partial Y/\partial I = b Y^{1 - \lambda} / \lambda I$$

Because the MPE ($\partial Y/\partial I$) is related to levels of expenditure and income, average values are used to evaluate the MPE as described in the text.

As noted earlier, the one exception is transportation. In this special case, the optimal value of λ is found to be zero. Using the original Box-Cox formula,

$$Y^* = (Y^\lambda - 1)/\lambda$$

it can be shown that as λ approaches zero, Y^* approaches the natural log of Y .¹¹ In this case, then, the Engel curve is specified as:

$$\ln(Y) = a + b \ln I + e$$

and so

$$\partial U/\partial I = \partial U/\partial Y * \partial Y/\partial I$$

$$\partial U/\partial Y = 1/Y;$$

$$\partial(a + b \ln I + e)/\partial I = b/I;$$

therefore,

$$\partial U/\partial I = (1/Y) * \partial Y/\partial I = b/I$$

$$\partial Y/\partial I = b * (Y/I)$$

Given these equations, calculating the actual value of the MPE is not difficult, but care must be taken to get the correct value for “ b .” In the case of Mexican families (that is, the control group), the appropriate value for “ b ” is shown in the regression equation; that is, it is the parameter estimate associated with income. However, for the average Puerto Rican family, the proper value of “ b ” is found by summing the income parameter shown for Mexicans with the income parameter shown for Puerto Ricans.¹² Note that “ b ” is used to calculate MPE in both the “unadjusted” and “standardized” cases. In the “unadjusted” case, all three terms in the MPE equation— b , I , and Y —can differ across geographic origin. However, in the “standardized” case, only b can differ by geographic origin. (Standardization is defined here to say, if all Hispanic families had the same amount of income, and allocated the same share to each good and service, how would their MPEs and income elasticities differ from each other?) Therefore, for 1994–95, if the income parameter estimate for Puerto Rican families is statistically significant, Puerto Ricans and Mexicans have statistically significantly different MPEs in the “standardized” results in 1994–95.¹³ Therefore, even if the average Puerto Rican and Mexican family started with the same income and food at home expenditure levels, the Puerto Rican and Mexican families would be predicted to allocate differently an additional dollar of income in 1994–95. For the 2000–01 results, a comparison of the parameter estimates alone is not sufficient to figure out whether differences are statistically significant; in this case, several coefficients are involved. For Mexican families, if the coefficient for income interacted with year (that is, bT) is statistically significant, then the income coefficient can be said to have changed over time for Mexican consumers. However, to compare Puerto Rican consumers with Mexican consumers in 2000–01, an F -test must be performed on the sum of the Puerto Rican income coefficient and the coefficient for the Puerto Rican income variable interacted with the year. If that sum is found to be statistically significantly different from zero, then Puerto Rican families in 2000–01 have a statistically significantly different MPE in the “standardized” results due to a difference

in the relationship of income and expenditure for Puerto Rican and Mexican families in 2000–01. For example, for food at home, the income coefficient for Puerto Rican families is 0.26478. This value is statistically significant at the 99-percent confidence level, indicating that the relationship between permanent income and food at home expenditures is different for Puerto Rican and Mexican families in 1994–95. The income parameter estimate for Puerto Rican families in 2000–01 is -0.19479. (This is the coefficient for the variable that is equal to income for all Puerto Rican families in 2000–01, but equal to zero for all families that are either not Puerto Rican or not interviewed in 2000–01.) The sum of the two parameters is 0.06999 (that is, $0.26478 - 0.19479 = 0.06999$). However, the *F*-statistic, which tests whether this sum is statistically significant, is 0.94. The critical *F*-statistic for 90 percent confidence is about 2.71; therefore, the sum of the parameters is not statistically different from zero, even at the 90-percent confidence level, and so it cannot be said with any degree of statistical confidence that Puerto Rican and Mexican families have different MPE's for food at home in 2000–01.

Income elasticity. Another important value that can be computed using the regression results is the income elasticity of each expenditure category. Income elasticity (often symbolized by the Greek letter “ η ”) is defined as the percent change in an expenditure given a 1-percent change in income. (For convenience, the income change is assumed to be positive throughout this analysis.) Most goods and services have a positive income elasticity—that is, a 1-percent increase in income yields an increase in expenditure for most goods and services. If the income elasticity is greater than zero but less than one, the good is called “inelastic,” because it is not very responsive to income changes. For example, an income elasticity of 0.5 indicates that a 1-percent increase in income is associated with an increase of one-half of 1 percent

in expenditures. However, if the elasticity is greater than one, the good or service is called “elastic,” because it is more responsive to these changes. Income inelastic goods are also frequently called “necessities,” and income elastic goods and services are often called “luxuries.” (Goods and services with negative income elasticities are called “inferior” goods, because an increase in income is associated with a *decrease* in expenditures for these items; however, no inferior goods are found in this analysis.) As usual, total expenditures are used as a proxy for “permanent” income here.

Once the MPE is found, the income elasticity is easily calculated. Its value is simply the MPE multiplied by the inverse expenditure share, or

$$\eta = \partial Y / \partial I * I / Y$$

For the cases where λ is greater than zero, the formula becomes:

$$\eta = (bY^{1-\lambda} / \lambda I) * I / Y = bY^{-\lambda} / \lambda = b / \lambda Y^{\lambda}$$

where *Y* is either the average expenditure for the ethnic group or all consumer units, depending on whether the “unadjusted” or “standardized” elasticity is being calculated.

In the case of transportation, the elasticity is even easier to calculate. It is simply the parameter estimate associated with income, regardless of whether the “unadjusted” or “standardized” elasticity is calculated. (As with the MPE, “unadjusted” elasticities are calculated using average annual expenditures and income of each ethnic group, whereas “standardized” elasticities are calculated using average annual expenditures and income for all consumer units.) The following equation proves this statement, using the MPE for the situation where λ equals zero:

$$\eta = \partial Y / \partial I * I / Y = b * (Y / I) * I / Y = b$$

Notes to the appendix

¹ Geoffrey D. Paulin and David L. Ferraro, “Do Expenditures Explain Income? A Study of Variables for Income Imputation,” *Journal of Economic and Social Measurement*, 22, 1996, pp. 103–28.

² G.E.P. Box and D.R. Cox, “An Analysis of Transformations,” *Journal of the Royal Statistical Society*, number 2, Series B, 1964, pp. 211–43.

³ Even if λ is 1, it is hard to imagine why *Y* is transformed to be *Y* - 1.

⁴ Stuart Scott and Daniel J. Rope, “Distributions and Transformations for Family Expenditures,” *1993 Proceedings of the Section on Social Statistics* (Alexandria, VA, American Statistical Association, 1993), pp. 741–46.

⁵ Perhaps a more acoustically pleasing term is “marginal propensity to spend,” but the abbreviation, MPS, might be confused with “marginal propensity to save,” which is the opposite of MPE. Another candidate is “marginal propensity to purchase,” but again, MPP is a term

commonly used in economic literature to indicate “marginal physical product.”

⁶ The exception is for goods or services that are perfectly price-inelastic. That is, quantities purchased do not change at all in response to changes in prices. An example is a life-saving prescription drug. A consumer who needs the drug will pay nearly any price to obtain it, even if it means selling possessions. However, even if the drug is inexpensive, the consumer will not increase quantity purchased, because the extra medication would be wasted. Nonetheless, while such goods and services may exist, they are unusual, and not likely to be found for the aggregate categories described; for example, in order for a good such as shelter and utilities or transportation to be perfectly price-inelastic, every component would have to be. Even with healthcare, this is not likely to be true. Even less likely, some components could have positive price elasticities and some negative, and in such magnitudes that they would exactly balance each other out in the aggregate. However, a positive price elasticity indicates an *increase* in quantity demanded as price rises, which is exceedingly

unlikely to be observed in practice; even if it were, the magnitudes of the component elasticities exactly balancing is also not likely to be observed.

⁷ Readers familiar with budget constraints and indifference curves will note that when calculating the Engel curve, the slope of the budget constraint remains constant, but income changes. But when relative prices change, the slope of the budget constraint changes. Even on the same indifference curve, consumers will decrease purchases of the more expensive good and increase purchases of the less expensive good. If income is held constant so that the budget constraint under the old and new price levels cross, consumers will still move to a different indifference curve in response to the change in relative prices. Either way, the Engel curve changes when relative prices change, except for goods with perfect price-inelasticity.

⁸ By contrast, it is easy to aggregate nominal expenditures: If someone goes out to eat twice and spends \$5 each time, and purchases one newspaper for \$1, the total expenditure for recreation and related services is \$11. However, when analyzing real expenditures, the effect of the price change is factored out, and it is unclear how to handle the real dollars. In real terms, the person went out to eat twice, and bought one newspaper. It is not clear how to aggregate two meals out and one newspaper to obtain a meaningful number. There are three entertainment expenditures made, but they are completely different goods that are consumed.

⁹ Some readers may be interested in the specific estimates for MPE and elasticity for each group when evaluated individually. That is, in the standardized results presented in the text, each group is assumed to have the same income and the expenditure for each good. In this section, MPE's and elasticities are estimates for each Hispanic group, using the average permanent income and expenditure for the specific group under study. The results do not generally differ a lot from the standardized results, but they are presented for purposes of comparison.

¹⁰ Note that in the equation “ e ” is a random error term. Even though the natural log of income is used in the equation, this symbol “ e ” should not be confused with the transcendental number “ e ” (approximate value: 2.718) which serves as the base number for which the natural log is calculated.

¹¹ To “prove” without calculus, choose some very small number,

such as 0.0001, for λ . Choose some positive number larger than one for Y . (choosing 1 will make the equation equal zero because 1 to any power still equals 1. Anything smaller will make the function negative, and a natural log is impossible to find. Because most expenditures, on average, are greater than \$1, choosing Y greater than 1 is plausible.) Exponentiating Y^* should yield the original value assumed for Y .

¹² The reason is that the parameter estimate for a specific group represents the *difference* between that group and the control group. For example, in a linear equation, suppose that the following regression results were obtained:

$$Y = 100 + 40P + 0.25I - 0.05I*P$$

Where P is a binary variable for Puerto Rican origin, and I is the income variable.

If Mexican families are the control group, then the Engel curve for Mexicans would be specified as:

$$Y = 100 + 0.25I.$$

However, for Puerto Rican families, the Engel curve would be specified to be:

$$Y = (100 + 40) + (0.25 - 0.05)I = 140 + 0.20I.$$

The interpretation of the coefficients is that (assuming all results are statistically significant) on average, before income is controlled for, Puerto Ricans would spend \$40 more than Mexicans for the good in question. However, the MPC for Puerto Ricans would be 0.05 cents less than that for Mexicans. Or one could say Mexicans on average allocate \$100 plus 25 cents of every dollar of income for the good in question, and Puerto Ricans on average allocate \$140 plus 20 cents of every dollar of income for the good in question.

¹³ For convenience, both “unadjusted” and “standardized” results are marked to indicate a statistically significant difference in parameter estimates. Although the “standardized” results can be interpreted more scientifically, because they indicate that there is a difference in MPE even with *ceteris paribus*, the statistical significance marker for the “unadjusted” results emphasizes that the difference is not just because mean expenditures or permanent incomes are different, but that there are additional effects to consider.