Consumption and Saving

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Lecture 1

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Evidence on Excess Smoothness and Excess Sensitivity in US

TABLE 1—RELATIVE SMOOTHNESS AND EXCESS
SENSITIVITY: U.S. AGGREGATE DATA

	Relative smoothness	Excess sensitivity
A. Annual Data		
$\Delta C_t / C_{t-1}$	0.48	0.17
	(0.04)	(0.07)
$\Delta C_t^{ND} / C_{t-1}^{ND}$	0.61	0.18
	(0.06)	(0.08)
$\Delta C_t^{S} / C_{t-1}^{S}$	0.43	0.14
	(0.04)	(0.06)
B. Quarterly Data		
$\Delta C_t / C_{t-1}$	0.47	0.16
	(0.04)	(0.03)
$\Delta C_t^{ND} / C_{t-1}^{ND}$	0.68	0.16
	(0.05)	(0.05)
$\Delta C_t^{S} / C_{t-1}^{S}$	0.46	0.15
	(0.03)	(0.03)

Source: Ludvigson and Michaelides, AER (2001)

Evidence on Excess Sensitivity from 15 OECD Countries

Table 10.1   **Regressions of Consumption Growth on Income Growth (standard errors in parentheses)**

Income Growth Measure	Coefficient on Income Growth[a]	Coefficient on Lagged Income Growth[b]
Current income (OLS)	.601 (.037)	.253 (.048)
Past 3 years	.725 (.220)	1.101 (.388)
Past 5 years	.964 (.194)	.97 (.237)
Past 10 years	1.000 (.524)	1.14 (.595)

Comovement of Income and Consumption over Life Cycle
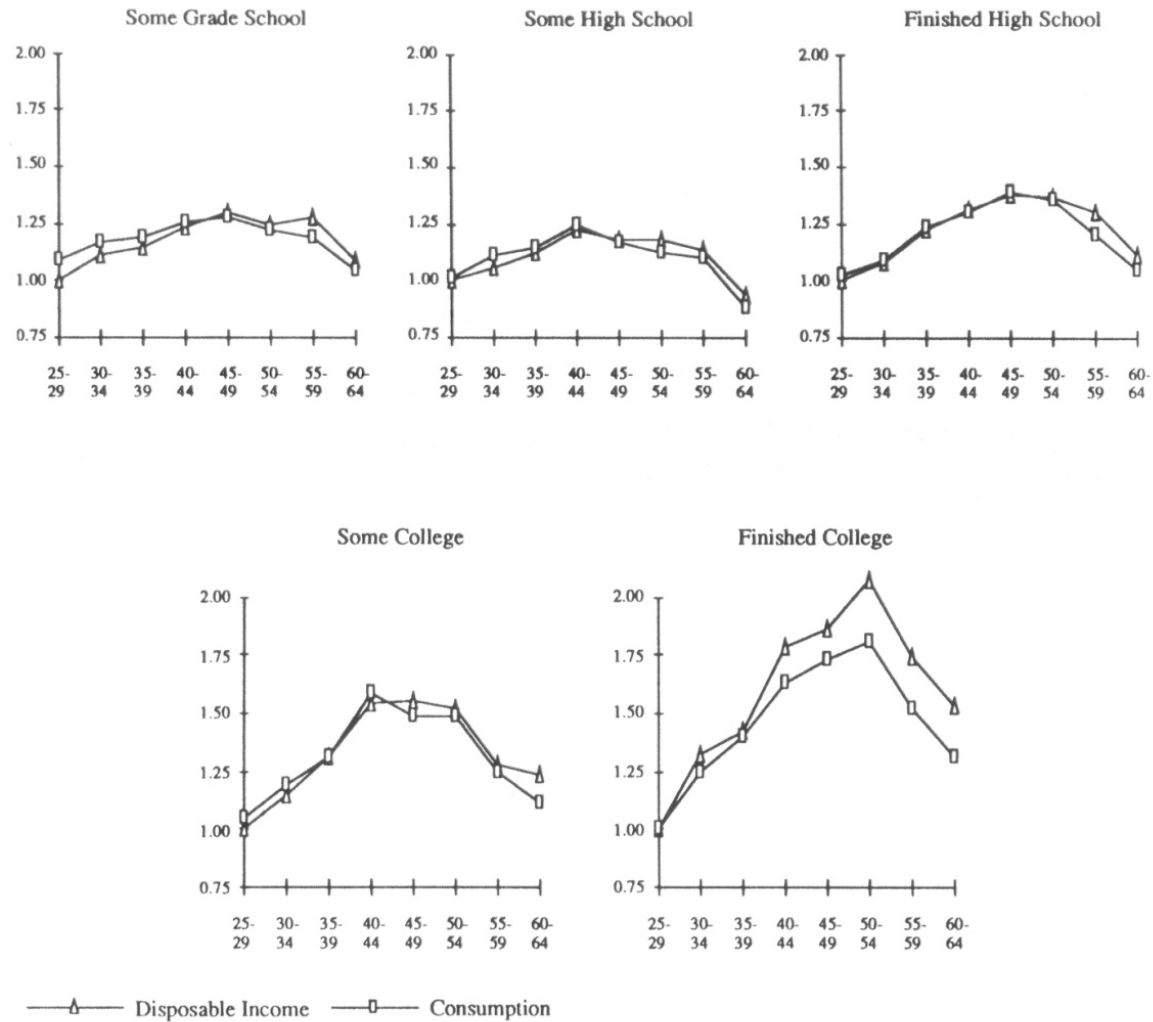
Fig. 10.7a   Income and consumption profiles by educational group, 1960–61 CES

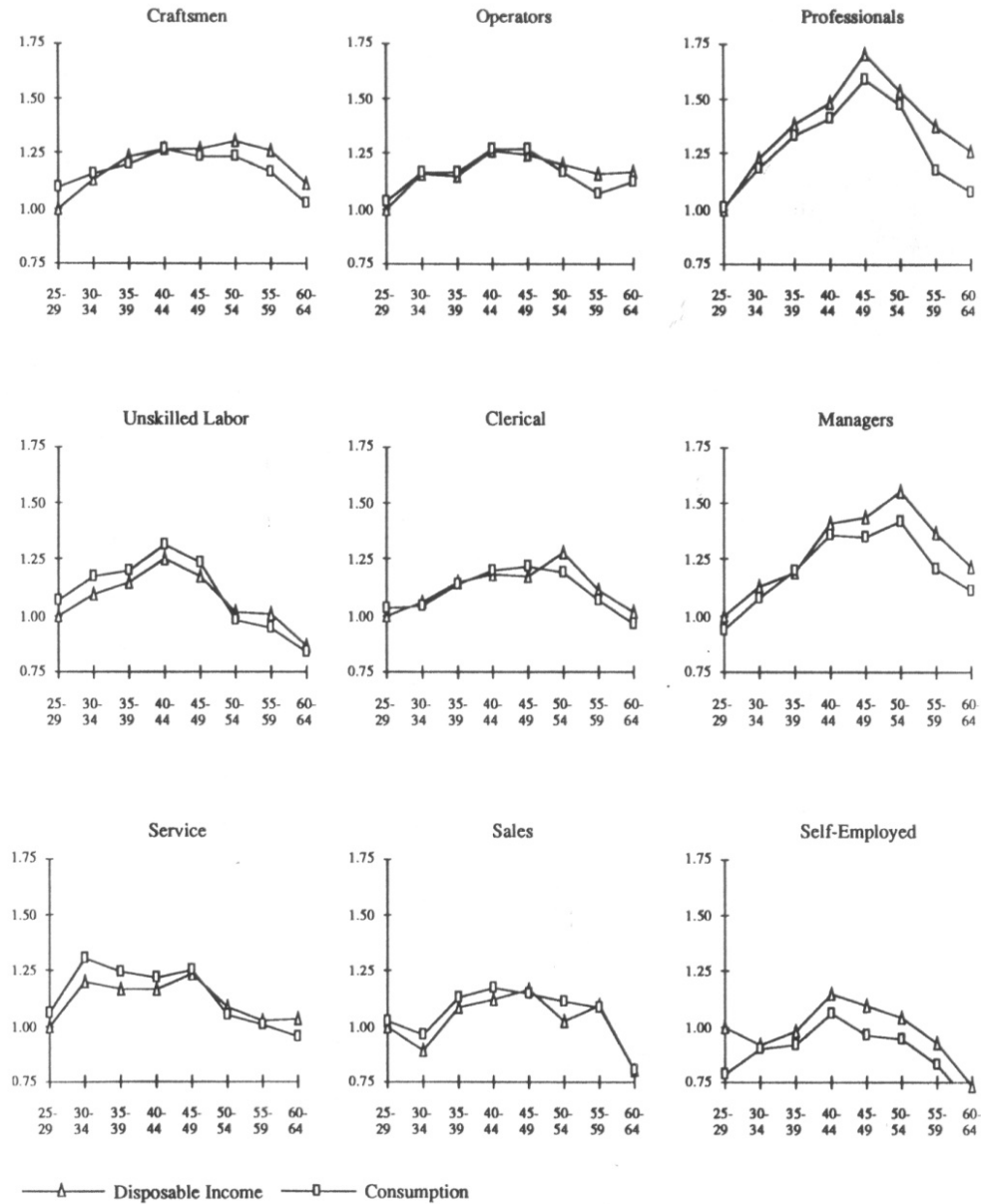*Source:* Calculations by authors using CES tapes.

Fig. 10.7b   Income and consumption profiles by occupational group, 1960–61 CES

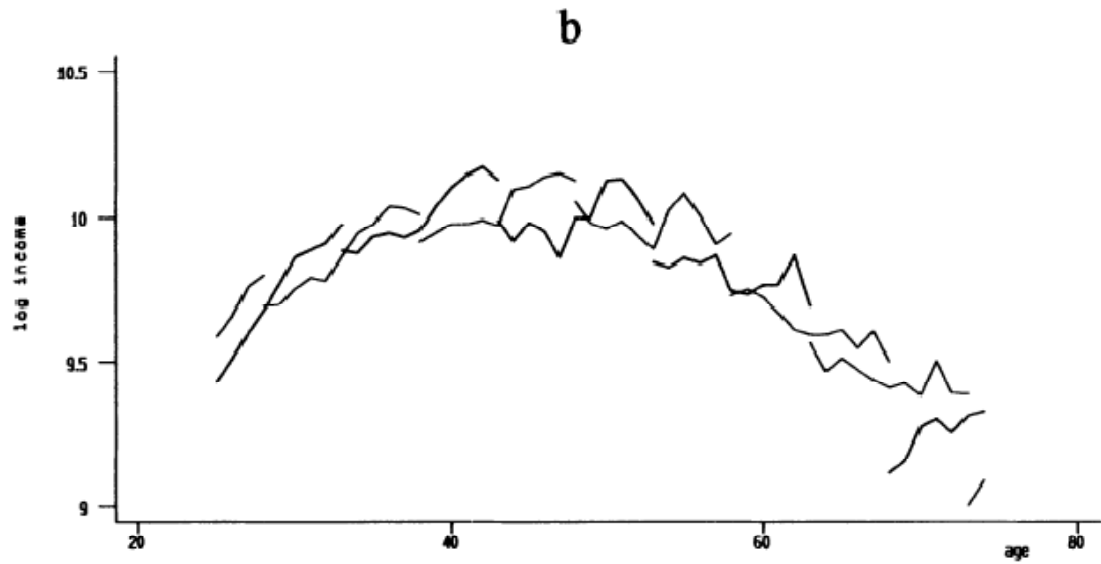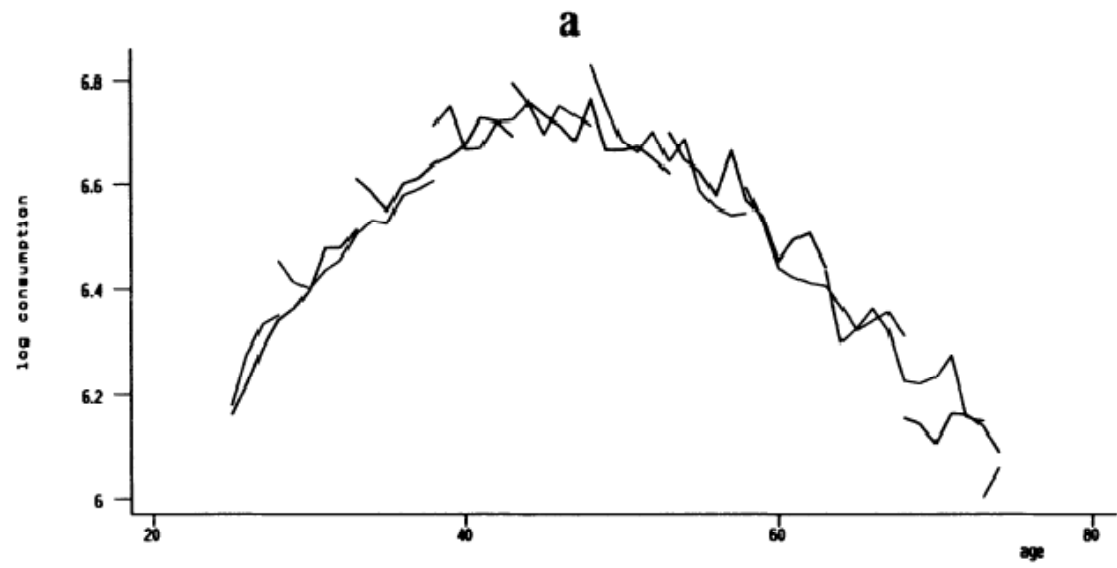*Source:* Calculations by authors using CES tapes.

FIG. 1.—a, Log of household nondurable consumption. b, Log of after-tax household income.
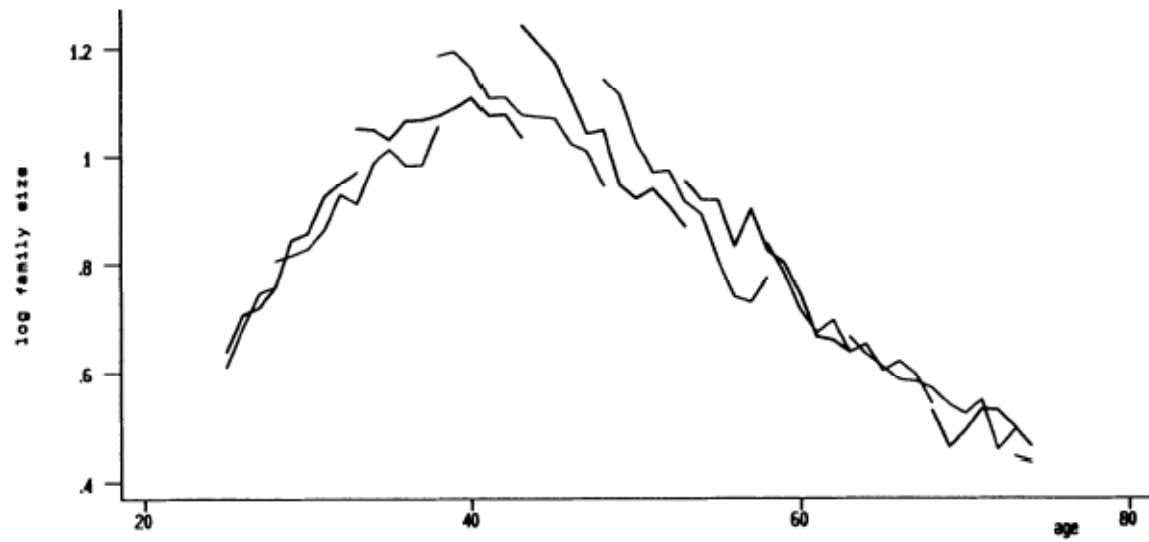
Attanasio and Weber (1995)

FIG. 2.—Log of family size
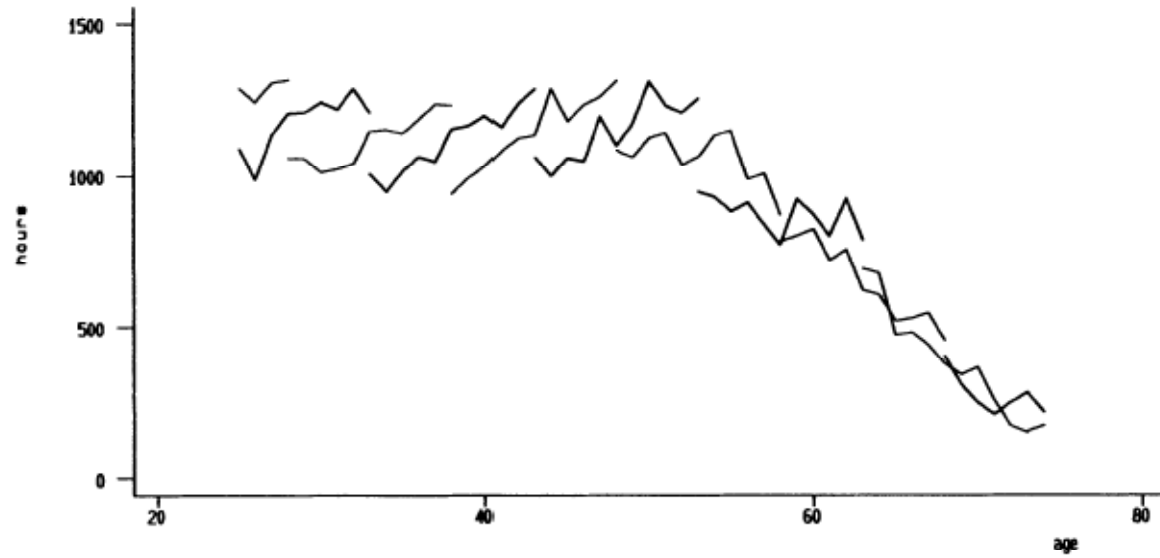
FIG. 3.—Female annual hours of work

Attanasio and Weber (1995)

TABLE 2

Estimates Based on Aggregate CEX Data (Weighted)

$$\frac{1}{H}\sum_h \Delta \log(c_{t+1}^h) = \text{intercept} + \tilde{\sigma} r_{t+1} + \theta \frac{1}{H}\sum^h \Delta \log(\text{famsize})_{t+1}^h + v_{t+1}$$

θ (1)	σ (2)	Sargan Criterion (p-Value) (3)
.855 (.256)	.214 (.381)	2.02 (.569)

$$\Delta \log\frac{1}{H}\sum_h c_{t+1}^h = \text{intercept} + \tilde{\sigma} r_{t+1} + \tilde{\theta}\Delta \log\left(\frac{1}{H}\sum^h \text{famsize}_{t+1}^h\right) + \tilde{v}_{t+1}$$

$\tilde{\theta}$ (1)	$\tilde{\sigma}$ (2)	Sargan Criterion (p-Value) (3)
.474 (.246)	.452 (.411)	8.42 (.038)

Note.—MA(1)-consistent standard errors are in parentheses. The intercept in each equation is season-specific. Instruments used are the second and fourth lags of consumption growth, the second lag of inflation, and the interest rate, plus the following exogenous explanatory variables: S1–S4 and $\Delta \log(\text{famsize})$. The Sargan criterion is a χ^2 test of the overidentifying restriction with three degrees of freedom.

Attanasio and Weber (1995)

TABLE 3

Euler Equation for Total Consumption Expenditure
(Using Stone Price Index to Deflate Total Nondurable Expenditure)

$$\Delta \log(\widehat{c_{t+1}}) = \text{constant} + \sigma \log(1 + r_{t+1}) + \theta' \Delta \widehat{z_{t+1}} + \epsilon_{t+1}$$

	1981:3–1990:4 (Cohorts 1–8; $N = 288$)			1982:3–1990:4 (Cohorts 1–8; $N = 256$)		
	(1)	(2)	(3)	(4)	(5)	(6)
Real interest rate .51	.392 (.280)	.341 (.276)	.149 (.347)	.386 (.212)	.480 (.282)	.331 (.316)
$\Delta \log(\text{famsize})$ .16	.365 (.186)	1.172 (.399)	.948 (.479)	.534 (.178)	1.539 (.383)	1.413 (.417)
Δchildren .18		−.539 (.169)	−.453 (.200)		−.617 (.186)	−.558 (.192)
Δww .12		−1.551 (.666)	−1.560 (.639)		−1.808 (.665)	−1.826 (.649)
$\Delta \ln(wl)$ .07		−2.578 (.835)	−2.486 (1.046)		−3.207 (1.185)	−3.011 (1.144)
Δsingle .07		−2.239 (.912)	−2.157 (.906)		−2.744 (.828)	−2.567 (.987)
$\Delta \log(\text{labor income})$ .24	.247 (.058)		.100 (.103)	.200 (.060)		.094 (.089)
Sargan criterion (p-value)	24.85 (.36)	11.66 (.92)	12.34 (.87)	30.13 (.15)	12.11 (.91)	13.06 (.84)

NOTE.—Asymptotic standard errors are in parentheses. All specifications include a constant and three seasonal dummies. The instrument set is the same across columns and includes the second to fourth lags of consumption growth, inflation, nominal interest rates, and labor income growth; the second and third lags of all the other variables listed; the second and third lags of the number of earners; three seasonal dummies; age; age squared; and a constant. The numbers under the variable names are the R^2's of the first step regression on the 1981:3–1990:4 sample. ww is the dummy for the wife working full-time, $\ln(wl)$ is the log of the wife's annual hours of leisure, single is the dummy for single consumers, and children is the household members between the ages of 0 and 15.

Attanasio and Weber (1995)

TABLE 2—THE CONTEMPORANEOUS RESPONSE OF EXPENDITURES TO THE TAX REBATE

| | Panel A. Dependent variable: dollar change in expenditures on: | | | | | |
| | Food | Strictly nondurable goods | Nondurable goods | Food | Strictly nondurable goods | Nondurable goods |
Estimation method	OLS	OLS	OLS	OLS	OLS	OLS
Rebate	0.109	0.239	0.373			
	(0.056)	(0.115)	(0.135)			
I(Rebate > 0)				51.5	96.2	178.8
				(27.6)	(53.6)	(65.0)
Age	0.570	0.449	1.165	0.552	0.391	1.106
	(0.320)	(0.550)	(0.673)	(0.318)	(0.548)	(0.670)
Change in adults	130.3	285.8	415.8	131.1	287.7	418.6
	(57.8)	(90.0)	(102.8)	(57.8)	(90.2)	(102.9)
Change in children	73.7	98.3	178.4	74.0	98.7	179.2
	(45.3)	(82.4)	(98.3)	(45.3)	(82.5)	(98.3)
RMSE	934	1680	2047	934	1680	2047
R^2 (percent)	0.6	0.6	0.6	0.6	0.6	0.6

Johnson, Parker, and Souleles (2006)

Table 5: The propensity to spend across different households

Dependent variable: ΔC_{t+1}

Dollar change in:	Non-durable goods (strict)	Non-durable goods	Non-durable goods (strict)	Non-durable goods	Non-durable goods (strict)	Non-durable goods
	Interaction: Age Low: age ≤ 39 High: age > 55		Interaction: Income Low: ≤ 34,300 High: > 69,000		Interaction: Liquid Assets Low: ≤ 1,000 High: > 8,000	
Fraction of rebate spent in first three-month period						
$Rebate_{t+1}$ (Middle group)	0.222 (0.177)	0.326 (0.211)	0.050 (0.163)	0.130 (0.185)	-0.284 (0.177)	-0.243 (0.217)
$Rebate_{t+1}$ *Low (Low group difference)	-0.035 (0.211)	0.071 (0.239)	0.317 (0.224)	0.624 (0.266)	0.569 (0.239)	0.876 (0.284)
$Rebate_{t+1}$ *High (High group difference)	-0.038 (0.263)	0.109 (0.302)	0.274 (0.251)	0.255 (0.291)	0.312 (0.299)	0.404 (0.364)

Johnson, Parker, and Souleles (2006)

TABLE 2—RESPONSE OF CONSUMPTION TO ALASKA PFD

	dlog(Nondurable consumption)			dlog(Durable consumption)		
	(1)	(2)	(3)	(4)	(5)	(6)
$\dfrac{PFD_t \times Family\ Size_h}{Family\ Income_h}$	0.0002 (0.0324)	−0.0167 (0.0336)	−0.0034 (0.0328)	−0.1659 (0.0878)	−0.1741 (0.0916)	−0.1488 (0.0890)
Controls for:						
Family size	No	No	Yes	No	No	Yes
Year dummies	No	Yes	No	No	Yes	No
Number of observations	806	806	806	806	806	806

Notes: Dependent variable is $\log(C_{IV}/C_{III})$. Standard errors are in parentheses. All regressions are ordinary least squares (OLS) and include a quadratic in age and changes in the number of children and adults in the household.

Hsieh (2003)

TABLE 3—RESPONSE OF CONSUMPTION TO ANTICIPATED FALL IN INCOME

| | dlog(*Nondurable consumption*) | | |
	(1)	(2)	(3)
$\dfrac{PFD_i \times Family\ Size_h}{Family\ Income_h}$	0.0318 (0.0376)	−0.0134 (0.0370)	−0.0157 (0.0378)
Controls for:			
Family size	No	No	Yes
Year dummies	No	Yes	No
Number of observations	857	857	857

Notes: Dependent variable is $\log(C_I/C_{IV})$. Standard errors are in parentheses. All regressions are OLS and include a quadratic in age, and changes in the number of children and adults in the household.

Hsieh (2003)

TABLE 6—RESPONSE OF NONDURABLE CONSUMPTION TO INCOME TAX REFUNDS AND PFD

	dlog(Nondurable consumption)	
	$\log(C_{II}/C_I)$	$\log(C_{IV}/C_{III})$
$\dfrac{PFD_t \times Family\ Size_h}{Family\ Income_h}$	—	0.0032 (0.0562)
$\dfrac{Income\ tax\ refund_h}{Family\ Income_h}$	0.2831 (0.1140)	—
Number of observations	369	369

Notes: Dependent variable is $\log(C_{II}/C_I)$ in the first column and $\log(C_{IV}/C_{III})$ in the second column. Standard errors are in parentheses. All regressions are OLS and include a quadratic in age and changes in the number of children and adults in the household.

Hsieh (2003)

Natural experiment literature

	Small	Large
Regular	Parker (1999): 0.6% Shea (1995): 0.01% Souleles (2002): 0.01%	Browning/Collado (2001): 7% Hsieh (2003): 3.4% Paxson (1993) Souleles (2000): 2.1% Stephens (2003)
Irregular	Johnson/Parker/Souleles (2004): 0.2% Shapiro/Slemrod (1995): 0.05% Souleles (1999): 1.3%	