Credit Card Use After the Final Mortgage Payment: Does the Magnitude of Income Shocks Matter?

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Permanent Income Hypothesis (Milton Friedman etc.)

Consumption Smoothing

If expect to get $$ in future …

…will borrow today…

….and pay the debt when get the expected $$

Empirical Test of Consumption Smoothing

Huge Literature

No Consensus

TESTS OF PIH USING IDENTIFIABLE INCOME SHOCKS

Authors	Jrnal	Date	Income Shock	Data	Support PIH
A: MAGNITUDE HYPOTHESIS EXPLANATIONS					
Coulibali and Li	REStat	2006	Final Mortgage Payment	CEX	Yes
Hsieh	AER	2003	Alaska Perm Fund	CEX	Yes
Browning, Collado	AER	2001	Annual Bonus	Spanish Household Cons	Yes
Souleles	AER	1999	Income Tax Refunds	CEX	No
Kreinin	AER	1961	Reparations Payments	Israeli Data	Yes
B: OTHER EXPLANATIONS					
Stephens	REStat	2008	Final Car Loan Payment	CEX	No
Agarwal, Liu, Souleles	JPE	2007	2001 Tax Rebates	Credit Card Accounts	No
Johnson, Parker, Souleles	AER	2006	2001 Tax Rebates	CEX plus Special Qs	No
Stephens	EJ	2006	Paycheck Date	UK Fam Expen Survey	No
Shapiro and Slemrod	AER	2003	2001 Tax Rebates	Michigan Survey	No
Stephens	AER	2003	Social Security	CEX Diary	No
Souleles	JPubE	2000	College Tuition	CEX	Yes
Parker	AER	1999	Social Sec Taxes	CEX	No
Shapiro and Slemrod	AER	1995	1992 Tax Change	Michigan Survey	No
Shea	AER	1995	Union Based Wage	PSID	No
Bodkin	AER	1959	Life Insurance	Survey of Cons Exp	No

Magnitude Hypothesis

Consumption smoothing will hold if the size of the predictable income shock is ***large*** enough, but will not hold if these predictable income shocks are ***small***.

Kreinin, 1961, Souleles, 1999, Browning and Collado, 2001, Hsieh, 2003, Coulibaly and Li, 2006, Stephens, 2008

1. Small future income shock (say $100),
   - Don't bother to arrange credit needed to smooth consumption,
   - or to engage in the "mental processing" to work out optimal consumption patterns.

2. Large future income shock (say $5000),
   - much more likely to smooth consumption by making use of credit and working out optimal stream of consumption over time.

This Study

- Predictable Future Income Shock - Final Mortgage Payment
- Consumption and Debt: Credit Card Data
- Confidential monthly statement data **(C Card AND Mrtg)** for 20 000 individuals over 19 months.

Test of the Magnitude Hypothesis

Are consumption and debt responses different for individuals with **high** compared to **low** expected disposable income shocks

(i.e. the cessation of high versus low monthly mortgage payments).

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Advantages of our Study

1. Unique Data

Unique Data - monthly credit card data is matched to monthly mortgage balance data.

First to use monthly bank account data to specifically test the magnitude hypothesis.

Gross and Souleles (2002a) and Agarwal, Liu and Souleles (2007) etc. use monthly credit card data to examine other issues.

2. Exact Identification of Shocks

- Monthly data on each individual's mortgage balance as it declines towards zero.

- Can isolate *exact* **month** and the *exact* **amount** of the final monthly mortgage payment.

- Better than previous research using survey data (CEX etc)

3. Randomization

- Exploit the random distribution of the date of the final mortgage payment across individuals.

- Identify exactly when specific individuals received this disposable income shock relative to all other individuals in our sample.

4. Selection Bias ?

Experiment: People who have just paid off mortgage

Control: All other mortgage holders.

All hold mortgages *and* credit cards at same bank.

All mortgage holders will eventually stop paying off mortgage.

5. Wide Variance in Amount of Final Mortgage Payment

- Can Split into large and Small Expected Future Income Shocks

- Many studies only have a dummy for income shock (tax refund etc)

6. Post Code and Census Data

- Bank statement data includes a Canadian postal code
- Match this data with Canadian Census data
- Provides post code level data on a variety of demographic variables.
- Test **RELATIVE** income hypothesis
  - income shocks should be classified as large or small *relative* to the agent's income.

7. Can Identify Predetermined Final Mortgage Payments

- Not sudden decision to pay off mortgage
- Only include instances where the date of an individual's final mortgage payment is predetermined.
- Measure REGULAR payments that are all the same size.
- "Amortizers" vs. "Lump-Sum" Payers

8. Excluding Alternative Explanations – Credit Constraints

Our individuals are NOT Credit Constrained

1. Sample includes those with Access to TWO credit sources – Credit card and Mortgage
2. Just paid off Mortgage in Full

3. Also – drop those with card balance/card limit >90% (Souleles et al, 2002, Agarwal et al, 2002).

The Institutional Environment

The Bank

- Full service retail bank
- Financial services including investments, mortgages, credit cards and deposit and checking accounts.
- Very well established over many decades.

Period of Our Data

- December 2004 to June 2006.
- Very rapid economic growth in Canada.
- Like most other Canadian banks, this bank was able to deal with the financial turbulence of 2008 without official assistance.

Individual has Multiple Cards

Gross and Souleles (2002a) and Agarwal, et al (2007)

1. Only include “active” credit cards in our analysis (i.e. cards for which there is regular monthly activity)

2. Include FICO scores as a control variable (which measures credit quality across all credit cards).

3. “Relationship lending” - benefits in using a credit card that is issued by the same bank that sells them other products (such as mortgages etc) - incentive to use the credit card in our study

Tests

Dependent Variables

Individual level credit monthly card behavior

1. The dollar value of credit card consumption (monthly)

2. The dollar value of change in credit card debt (monthly)

Consumption is a flow variable, debt is a stock variable - more appropriate to examine the ***change*** in debt.

Independent Variables

- FINAL, the exact month and exact dollar magnitude of the ***final mortgage payment*** of an individual's mortgage contract.

- Z - other control variables

- Time and Individual Fixed Effects

Specification

- Same Specification as Gross and Souleles (2002), Agarwal et al (2007)
- “Event Study” Interpretation
- Month fixed effects (time)
- Individual fixed effects (CustID).
- Use clustered robust standard errors(Petersen, 2008) .

Measurement

- All main variables measures in Dollars (consumption and debt as well as FINAL)
- No Dummy Variables
- Can measure magnitudes

Absolute and Relative Magnitude

- **Absolute Magnitude Hypothesis**
- No Adjustment to FINAL

- **Relative Magnitude Hypothesis**
- the variable FINAL is divided by the postal code level income variable (INC) for each individual in the sample.

Large and Small Income Shocks

1. Split at mean

2. Quadratic Form

Split at Mean: HI & LO

- divide the FINAL measures into large and small categories based on whether they are above or below the mean value of FINAL (i.e. $751).

- FINAL_HI: expected income shocks > $751
- FINAL_LO: expected income shocks t< $751

Quadratic Form

- magnitude hypothesis as an “inverted U” specification.

- The standard way of modeling such an “inverted U” specification is to include squared terms for FINAL (i.e. FINAL_SQ) in addition to the level terms.

Interpretation of Quadratic Coefficients

- Inverted U
- Positive Level; Negative Squared
- As magnitude of shock increases:

1. Consumption up then down
2. Debt declining as magnitude gets larger

Control Variables

- How much debt is being used?
- Card Balance/Limit

- How Much Debt is available?
- Card Limit

Results

FIGURE 1: SPEND MORE AFTER SMALL SHOCK
Coefficients on Consumption (Cumulative)
From Tables 3,4,5

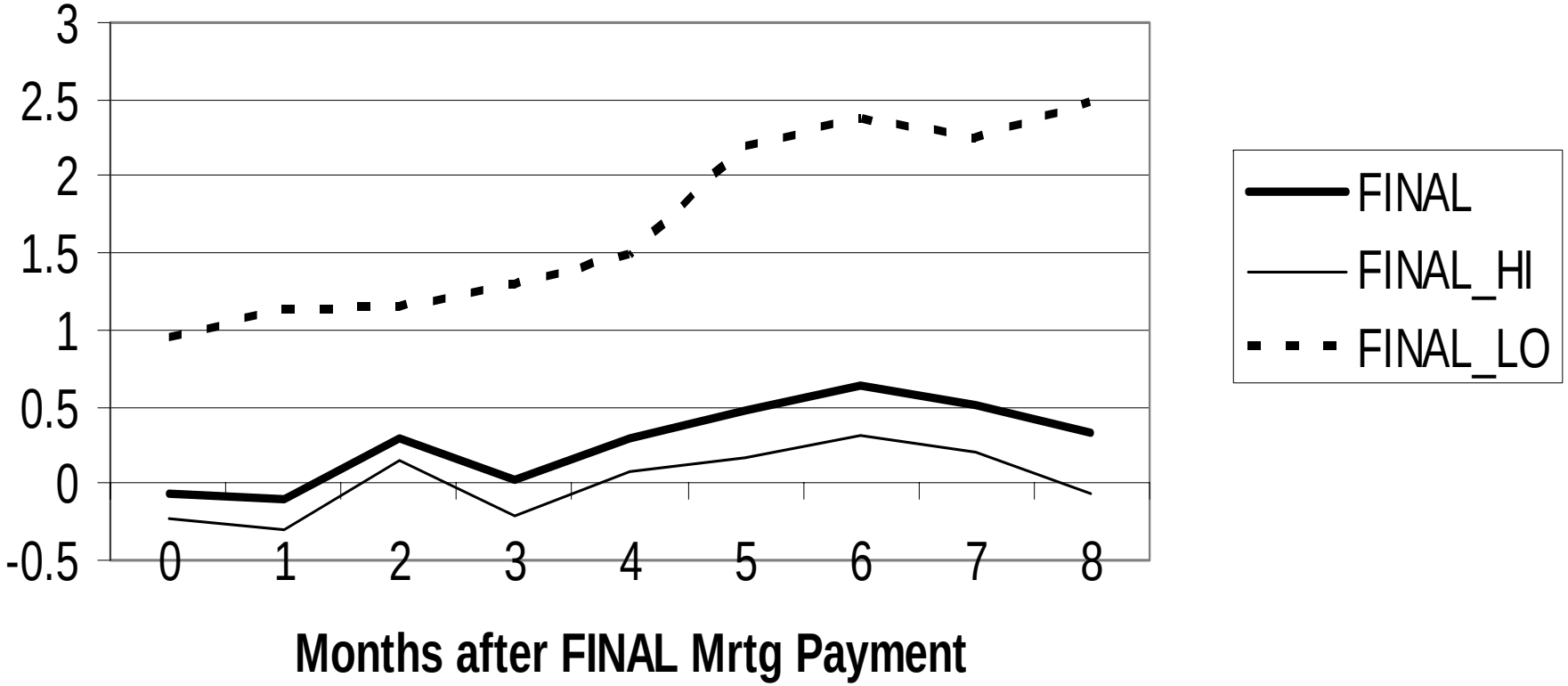
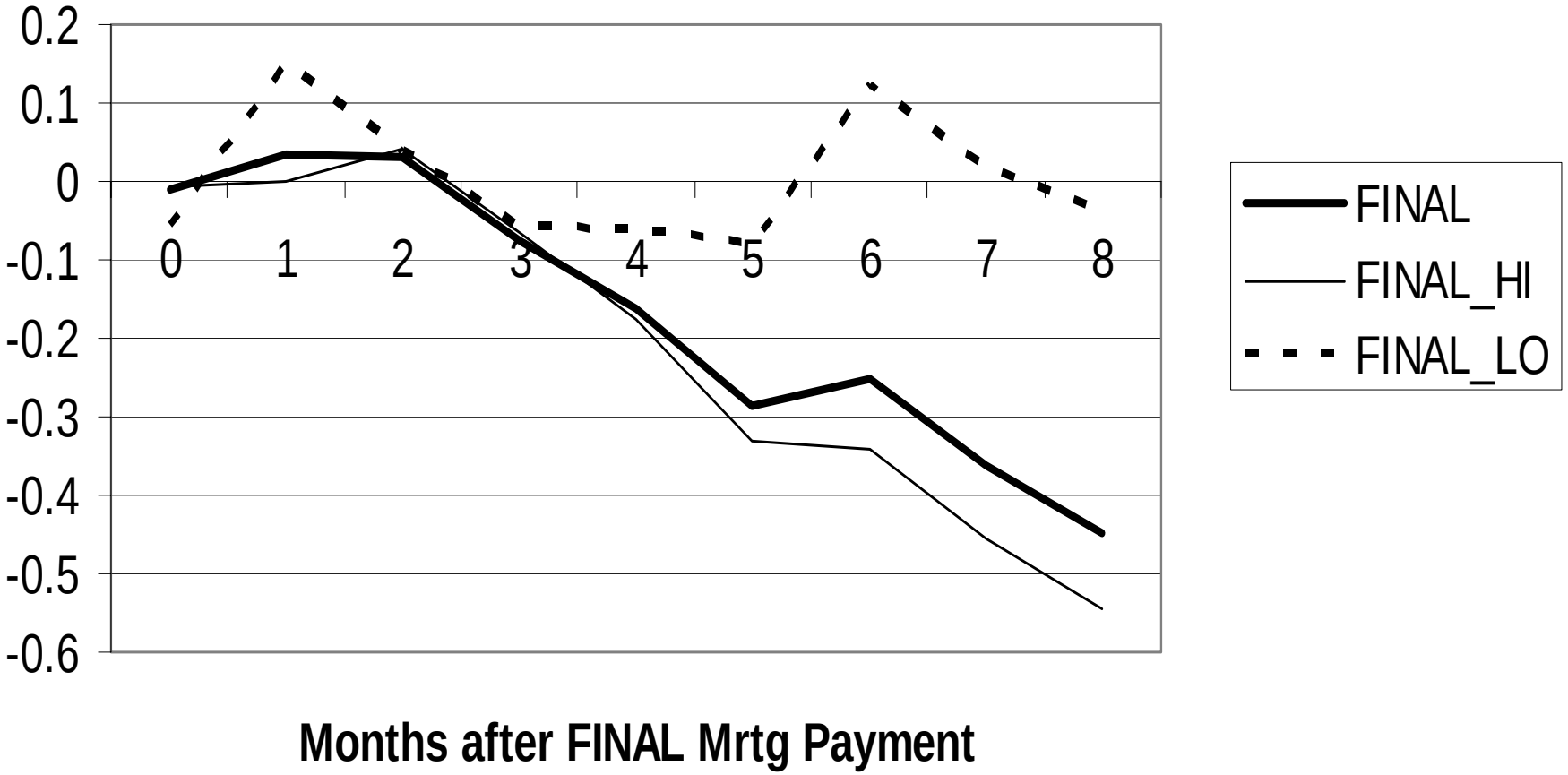


FIGURE 2: DEBT DOWN AFTER LARGE SHOCK
Coefficients on Change in Debt (Cumulative)
From Tables 7,8,9



Do Magnitudes Matter?