How Does Unemployment Insurance Affect Consumer Spending?

Peter Ganong and Pascal Noel

UChicago Harris, Harvard

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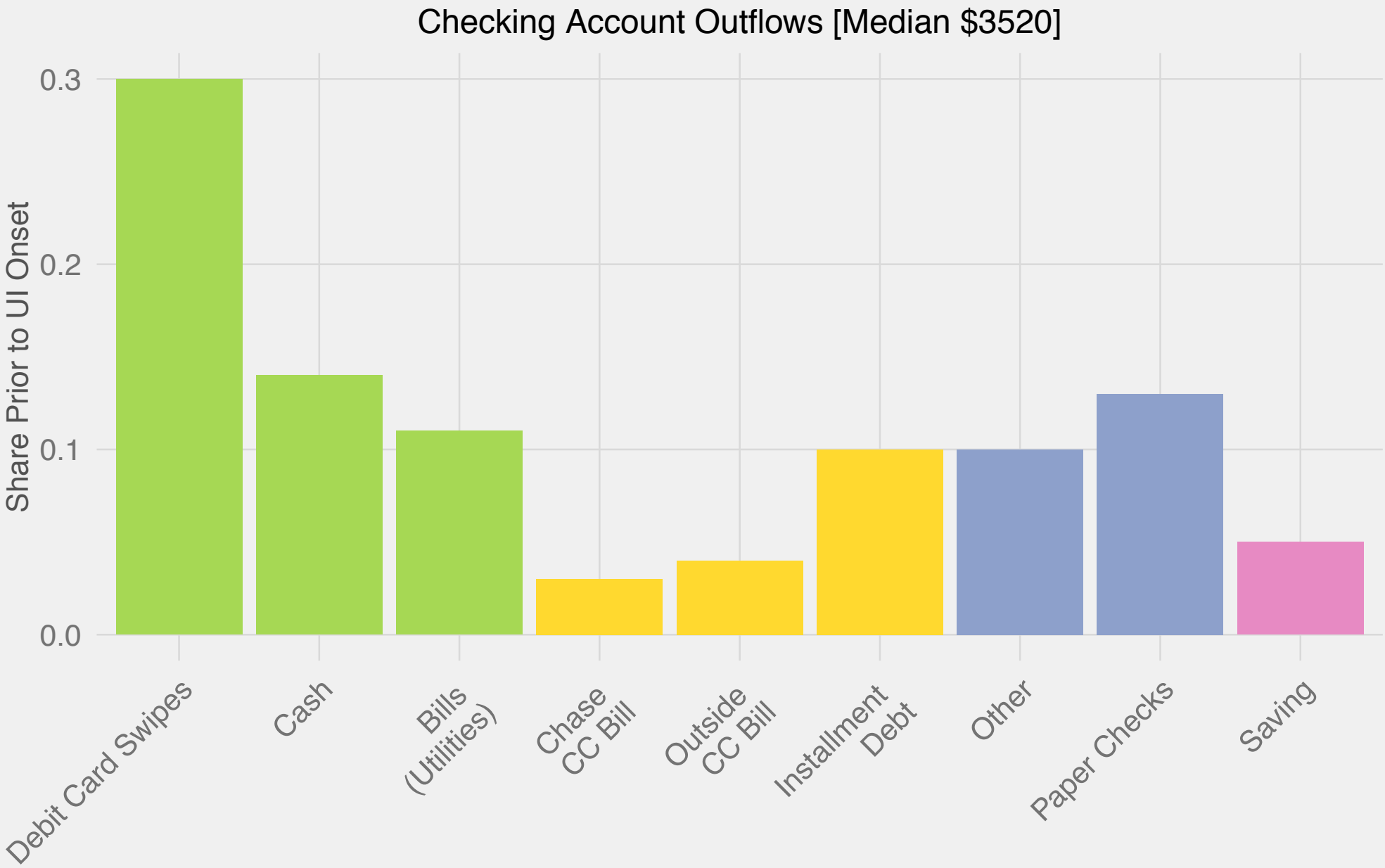
How Does Unemployment Insurance Affect Consumer Spending?

- Data: Chase bank accounts with direct deposit of UI benefits
- Empirics: Estimate path of spending for UI recipients. Why?
- Models
  - Inconsistent with canonical buffer stock model
  - Estimate alternative behavioral models [Gabaix 16, Campbell-Mankiw 89]
- Consumption-smoothing gains from UI

Data: Description

- Checking accounts – transaction type aggregated by month
- Oct 2012 through May 2015
- 210,000 UI recipients
- Concern: 28% of households have checking accounts at multiple banks [Consumer Financial Life Survey 14]
  1. Sum over family's linked accounts
  2. Select families that do most of their banking with Chase
     - Restriction: $\geq$5 monthly outflows

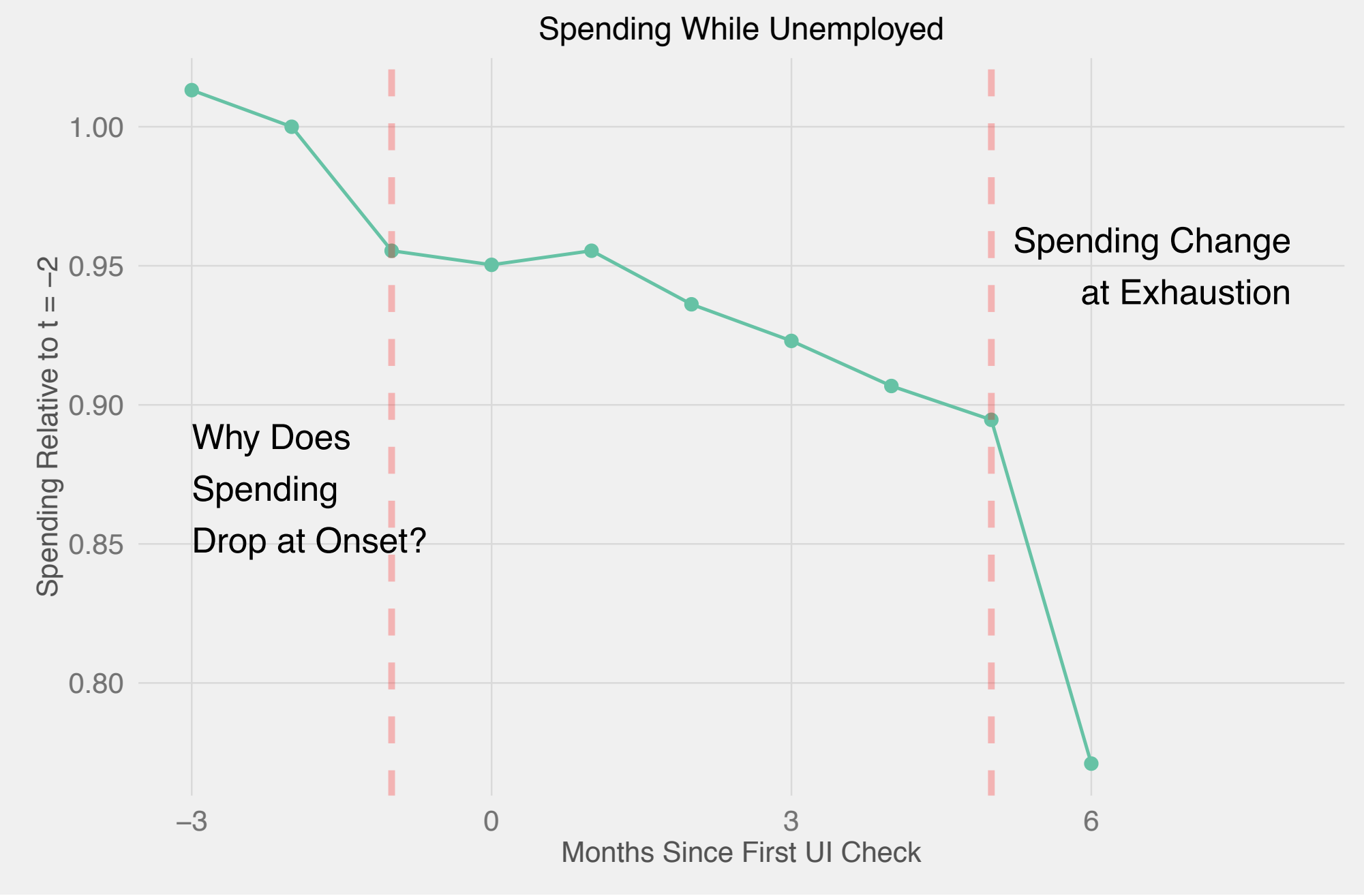
Data: Building Spending From Outflows



Data: Representativeness

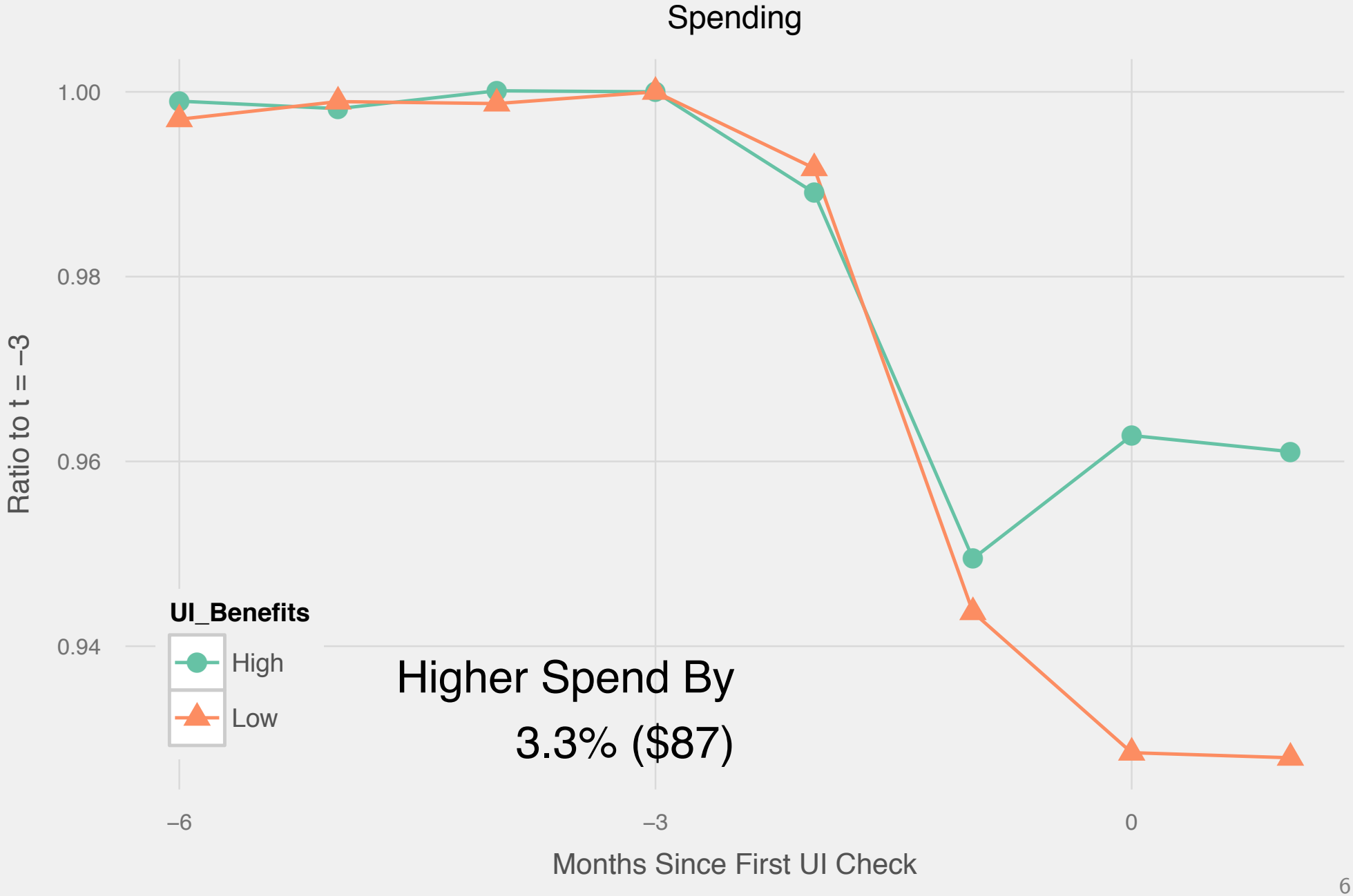
	Sample	Bank	Benchmark	Source
Pretax Fam Inc *	Prior to UI Receipt	$4,580	$5,080	SIPP ▸ Figure
Age §	Prior to UI Receipt	44	41	SIPP ▸ Figure
Ckg Balance *	Employed	$1,460	$1,500	SCF ▸ Figure
Spending §	Selected Categories	$1,799	$1,912	CEX ▸ Table
Geography	All	23 states	50 states	Chase ▸ Map

* median, § mean

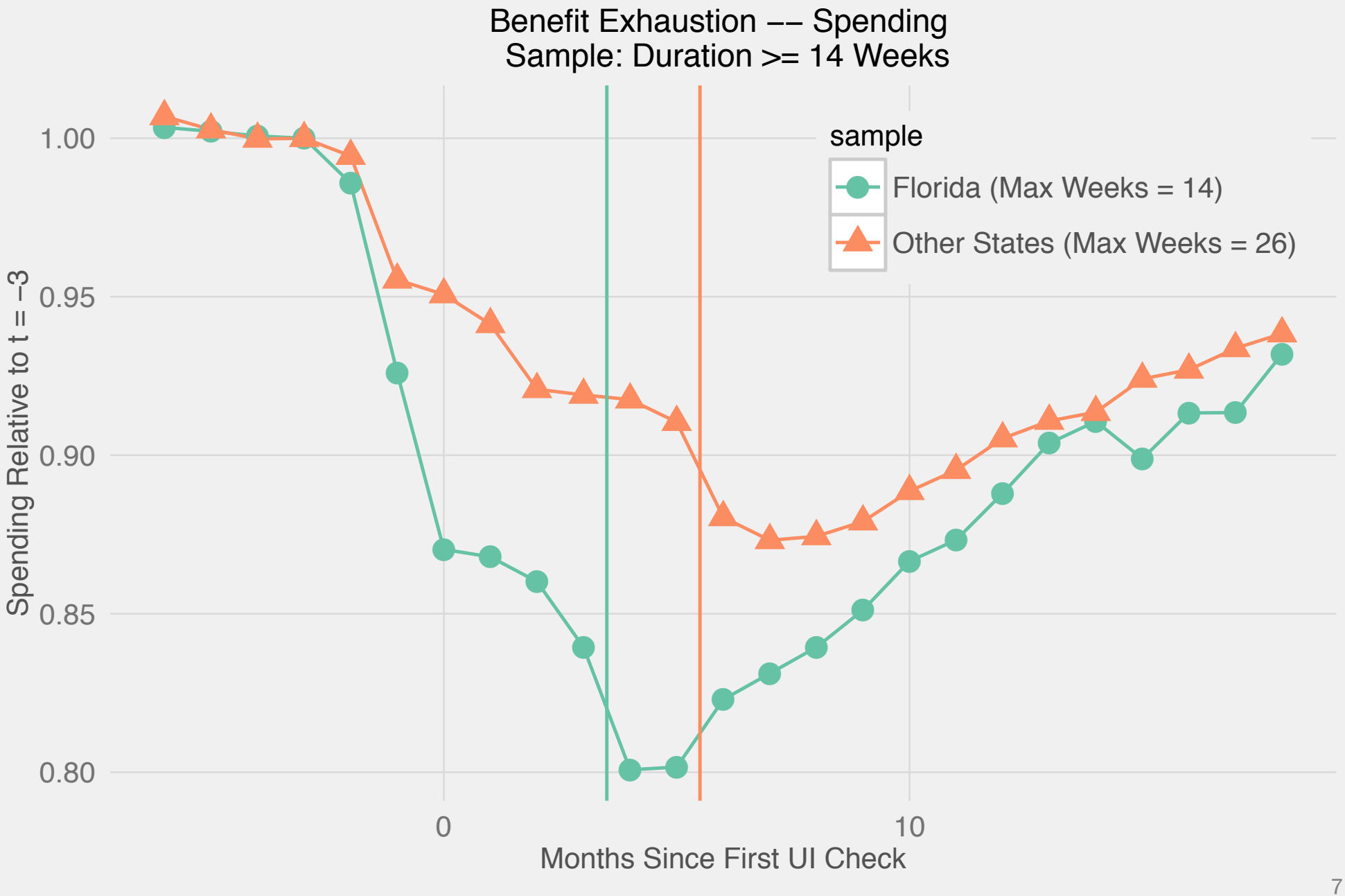


▸ Equation ▸ Ex Post Exhaustees ▸ Standard Errors

Why Does Spending Drop? Low Current Income



Exhaustion: State-Level Comparison: Spending



Exhaustion: Is Consumption Really Dropping?

	Pre-Exhaust	Post-Exhaust	Δ%
Large % Drop			
Drug Stores	$38	$31	-18%
Medical Copay	$28	$24	-14%
Food At Home	$289	$253	-13%
Entertainment	$25	$22	-11%
Small % Change			

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Food At Home	$289	$253	-13%
Entertainment	$25	$22	-11%
Small % Change			
Auto Loan	$76	$71	-7%
Mortgage	$148	$142	-4%
Insurance	$141	$138	-2%
Any Credit Bureau Delinquency	18%	19%	

Model: Data vs Calibrated Model

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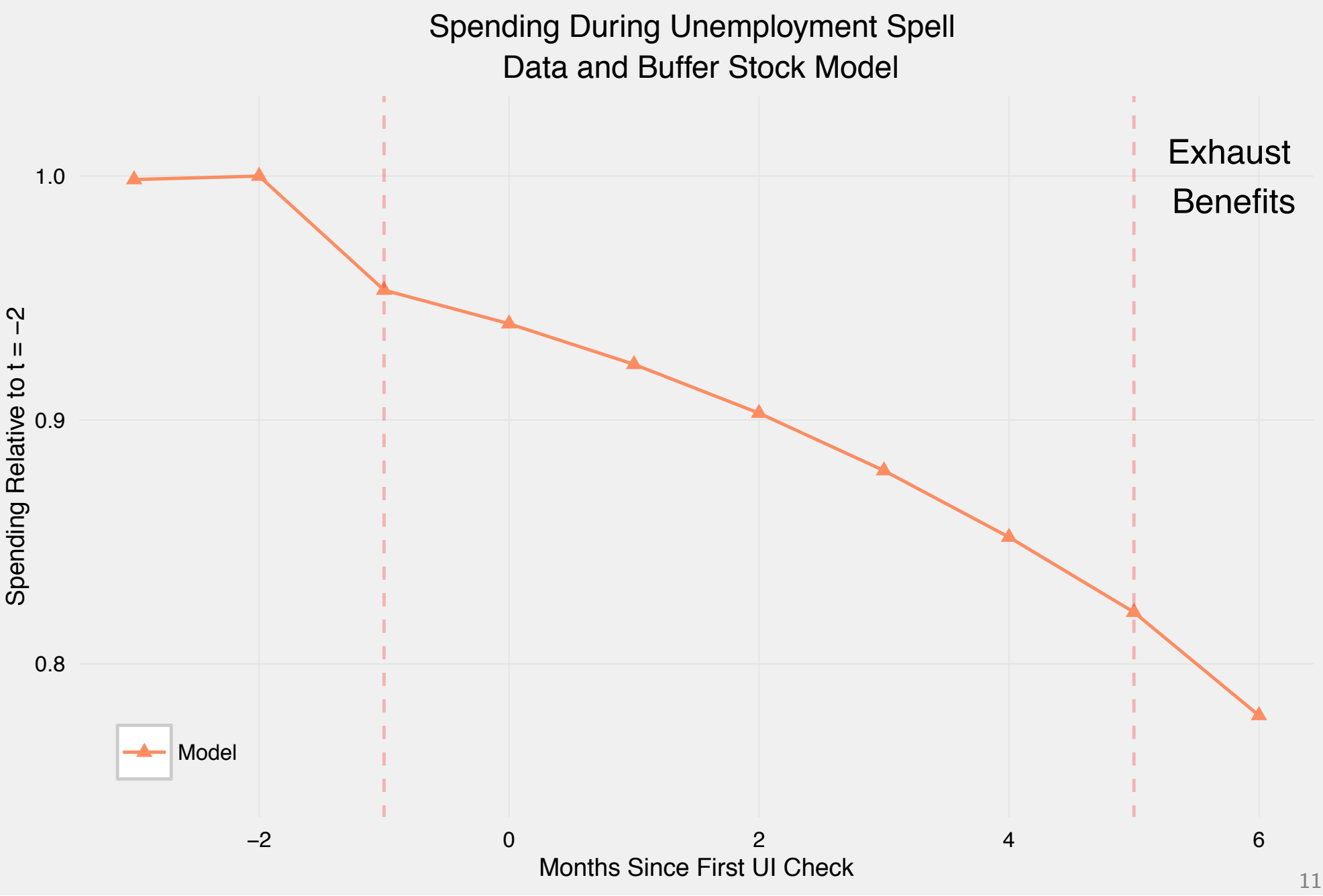

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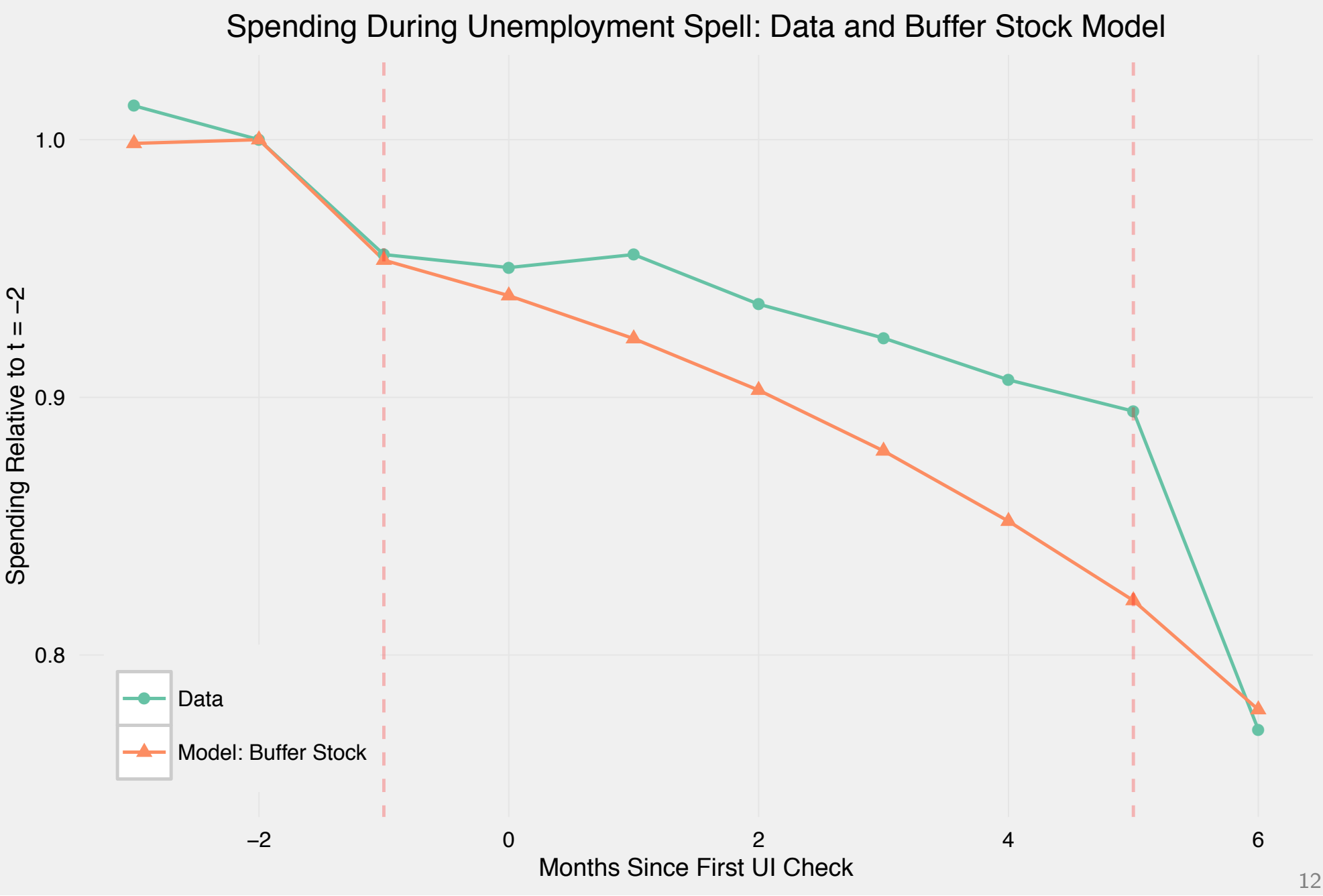


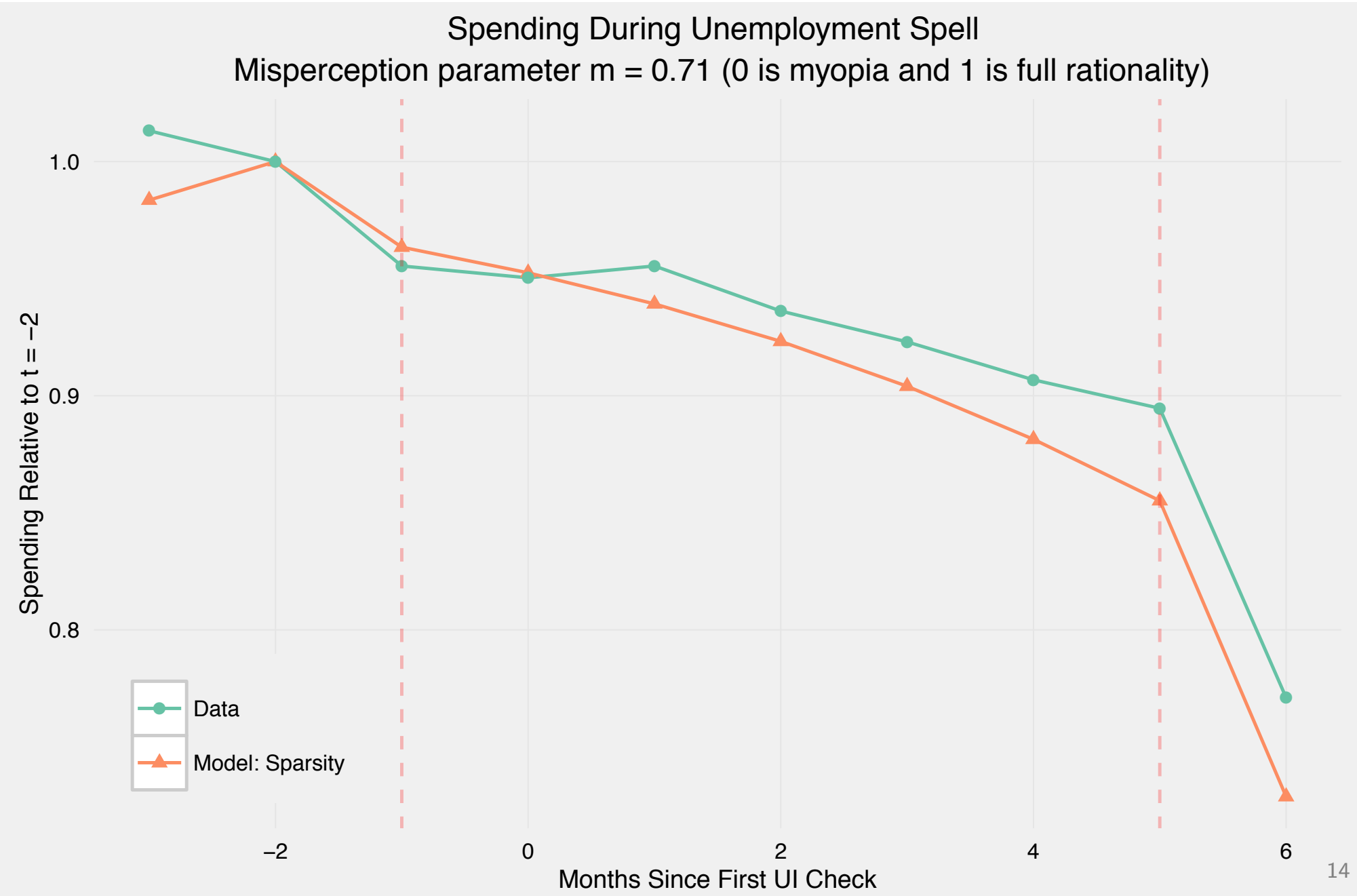
Five Close Cousins Do Not Predict Drop At Exhaustion

$$\theta = \arg\min_{\tilde{\theta}} \sum_t (c_t - \hat{c}_t(\tilde{\theta}))^2$$

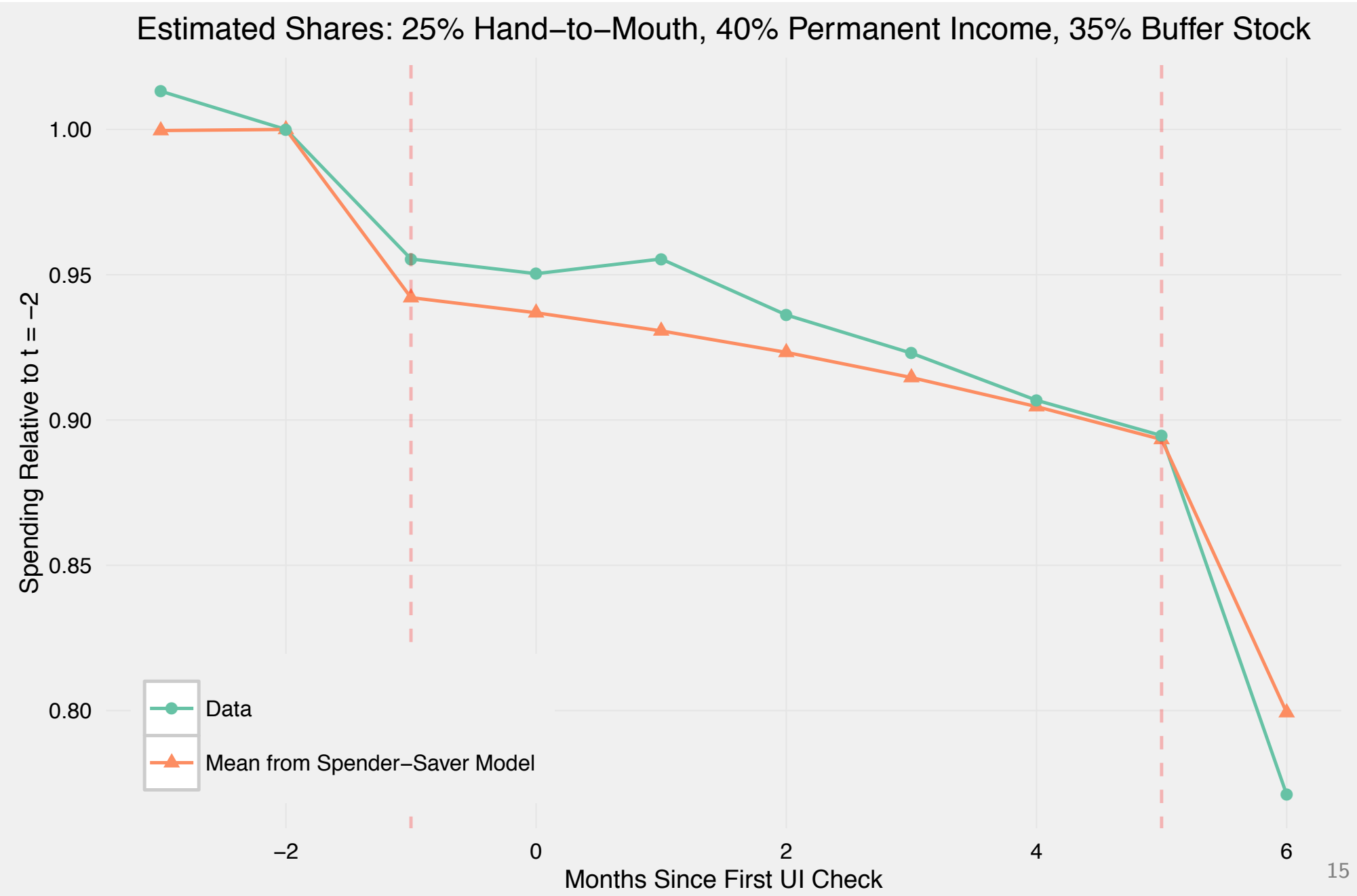
- Estimate discount factor and risk aversion ▸ Slide
- Alternative borrowing technology
  - Credit card borrowing ▸ Figure
  - Natural borrowing limit ▸ Figure
- Alternative time preferences
  - Heterogeneous impatience [Krusel Smith 98] ▸ Figure
  - Naive present-bias [Laibson 97] ▸ Figure

▸ Other Models

Sparse model [Gabaix 16]



Spender-Saver [Campbell-Mankiw 89]



Consumption-Smoothing Gains

	Gain Relative to a 1% Increase in Lifetime Income		
Model	UI Level ↑ 1.6%	UI Dur ↑ 1 Mo	Ratio (2)/(1)
Buffer stock	0.044%	0.122%	2.78
Spender-saver	0.054%	0.202%	3.72
Sparsity	0.071%	0.205%	2.89

Lessons for Consumer Financial Regulation

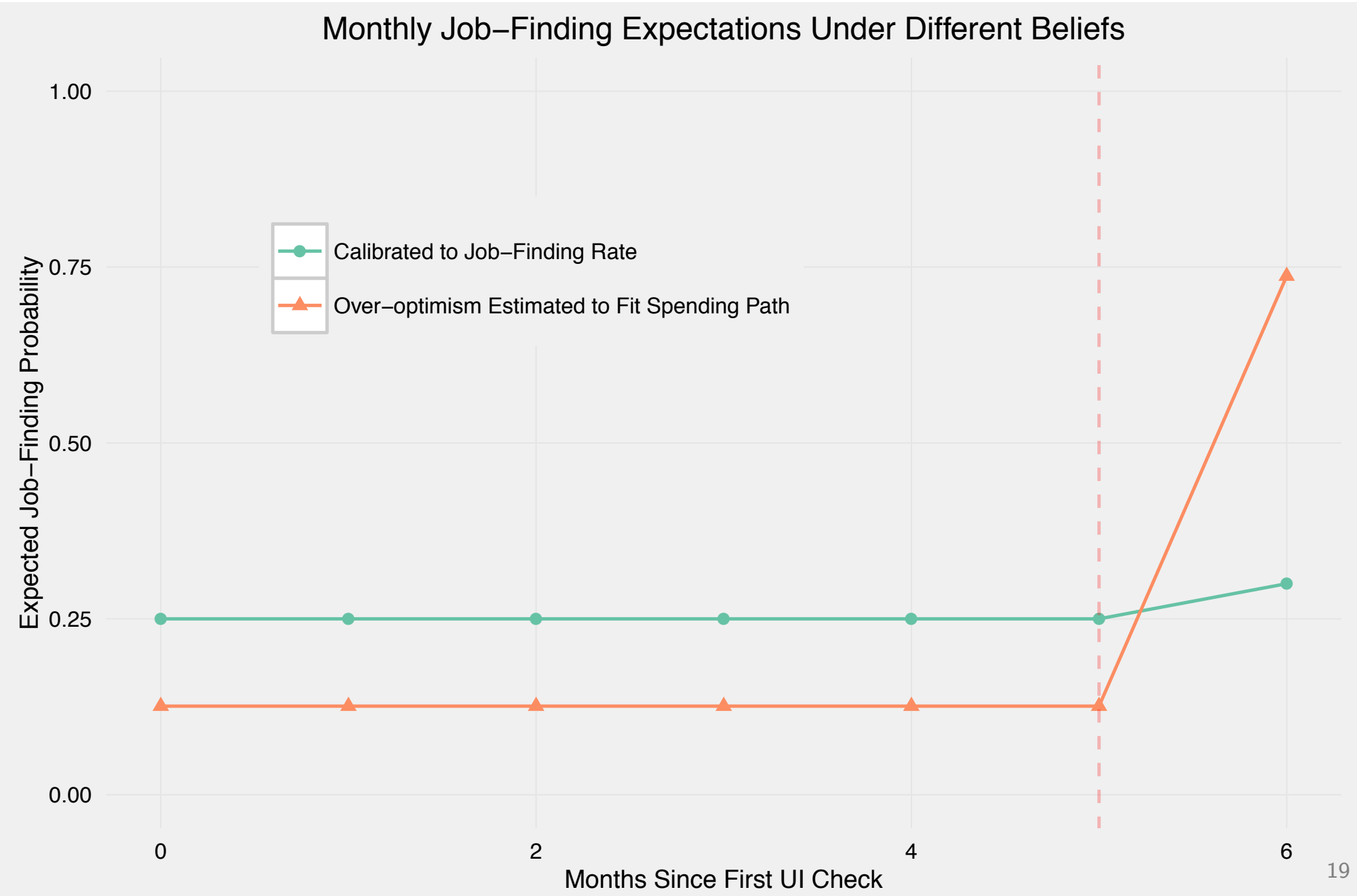
- Question: How to teach people to prepare for bad events?
- Failure to prepare creates possible opportunities for welfare improvement
  - This paper: Spend as if they don't expect exhaustion to happen
  - CFPB: Payday lending rule
    - Borrowers expect to repay sooner than they do [Bertrand and Morse 2011, Mann 2013]

Conclusion

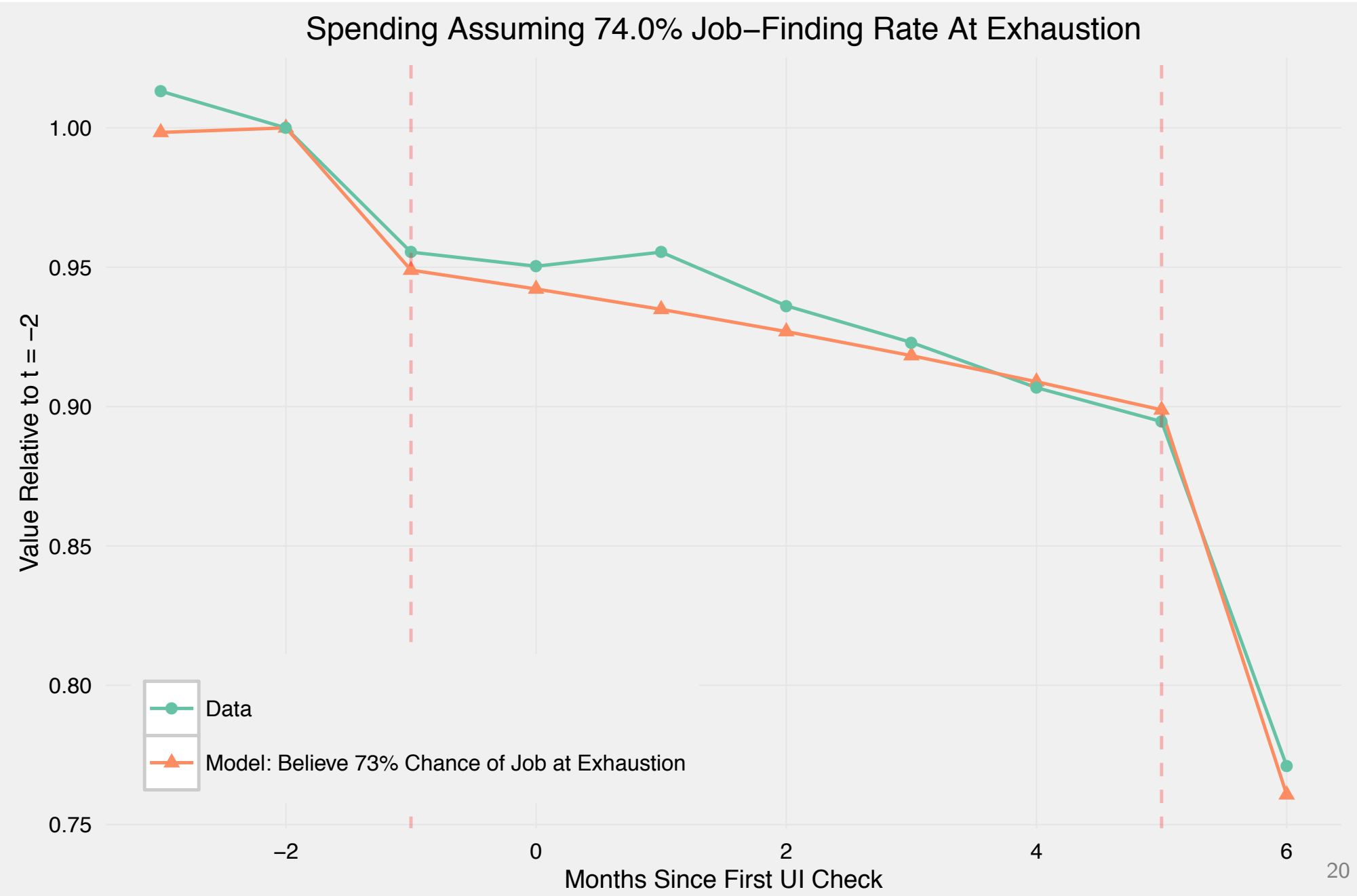
- Monthly spending tracks UI benefits
  1. Onset: MPC of 43 cents
  2. Exhaustion: Spending drops 11%

- Consequences of the drop at exhaustion
  - Reject rational model
  - Consistent with sparsity and spender-saver
  - Consumption-smoothing gains of *extending* UI benefits $>>$ *raising* UI benefits

Must *believe* job-finding rate is 74% [Spinnewijn 15]



Need to *believe* job-finding rate is 74% [Spinnewijn 15]

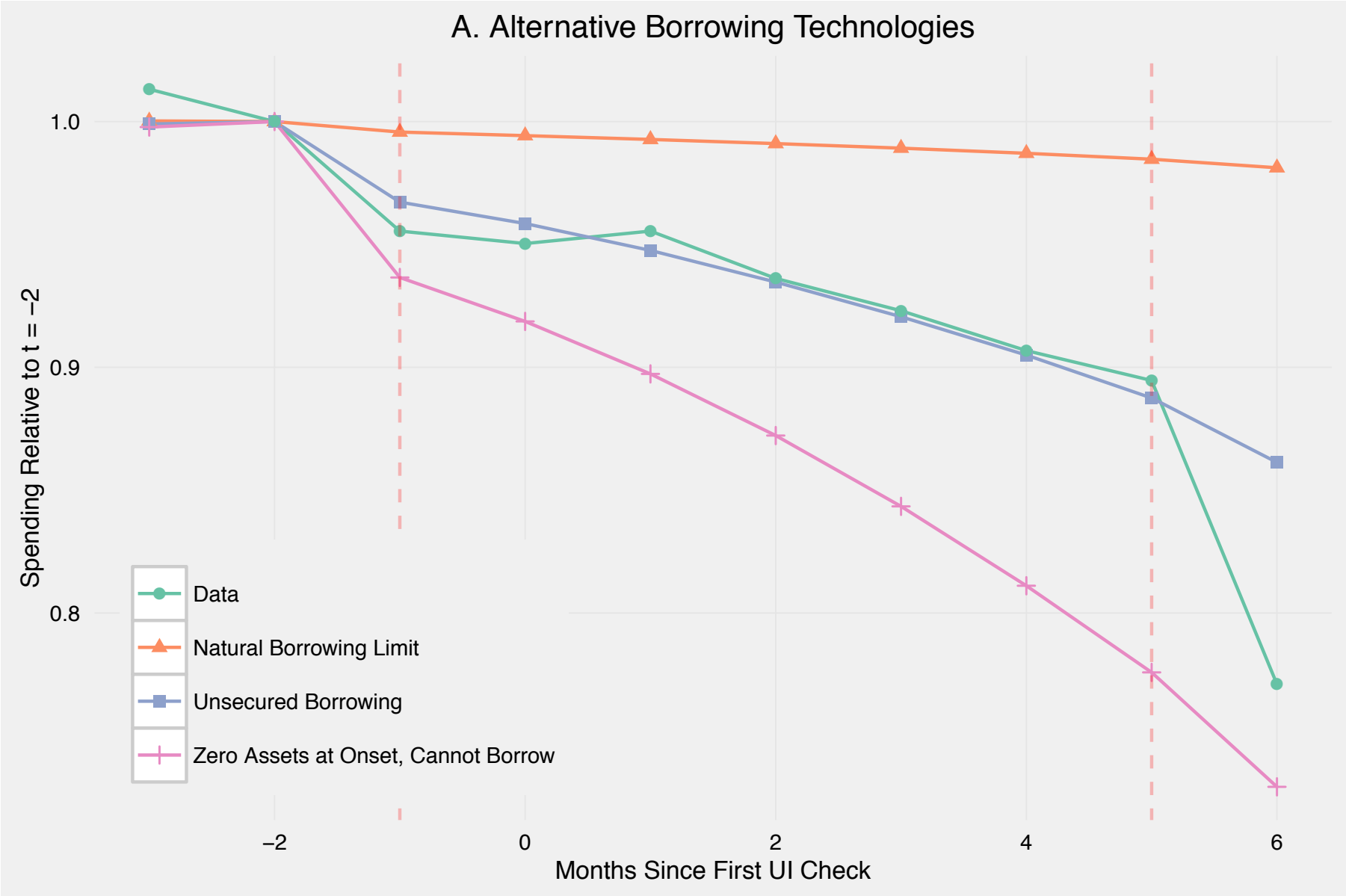


Model: Estimated Parameters

$$\theta = \begin{cases} \beta & \text{discount factor} \\ \gamma & \text{risk aversion} \end{cases}$$

$$\theta = \arg\min_{\tilde{\theta}} \sum_{t} (c_t - \hat{c}_t(\tilde{\theta}))^2$$

Model: Data vs Calibrated Model



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Other Models

- Durables Commitments
  - Model: Mortgage default should *raise* nondurables spending
  - Data: Spending *falls* at exhaustion
- Rational inattention ▸ Assets
  - Model:
    - Agents with most at stake are most rational (low-asset group and low-income group)
    - *smaller* drop for these groups
  - Data: *larger* drop for these groups
- Illiquid asset with transaction cost
  - Kaplan and Violante 14 estimate a $1,000 cost
  - Two-year loss from unemployment is mean $10,000 $\Rightarrow$ agent should liquidate to smooth consumption
  - Complicating factor: dynamic uncertainty from unemployment

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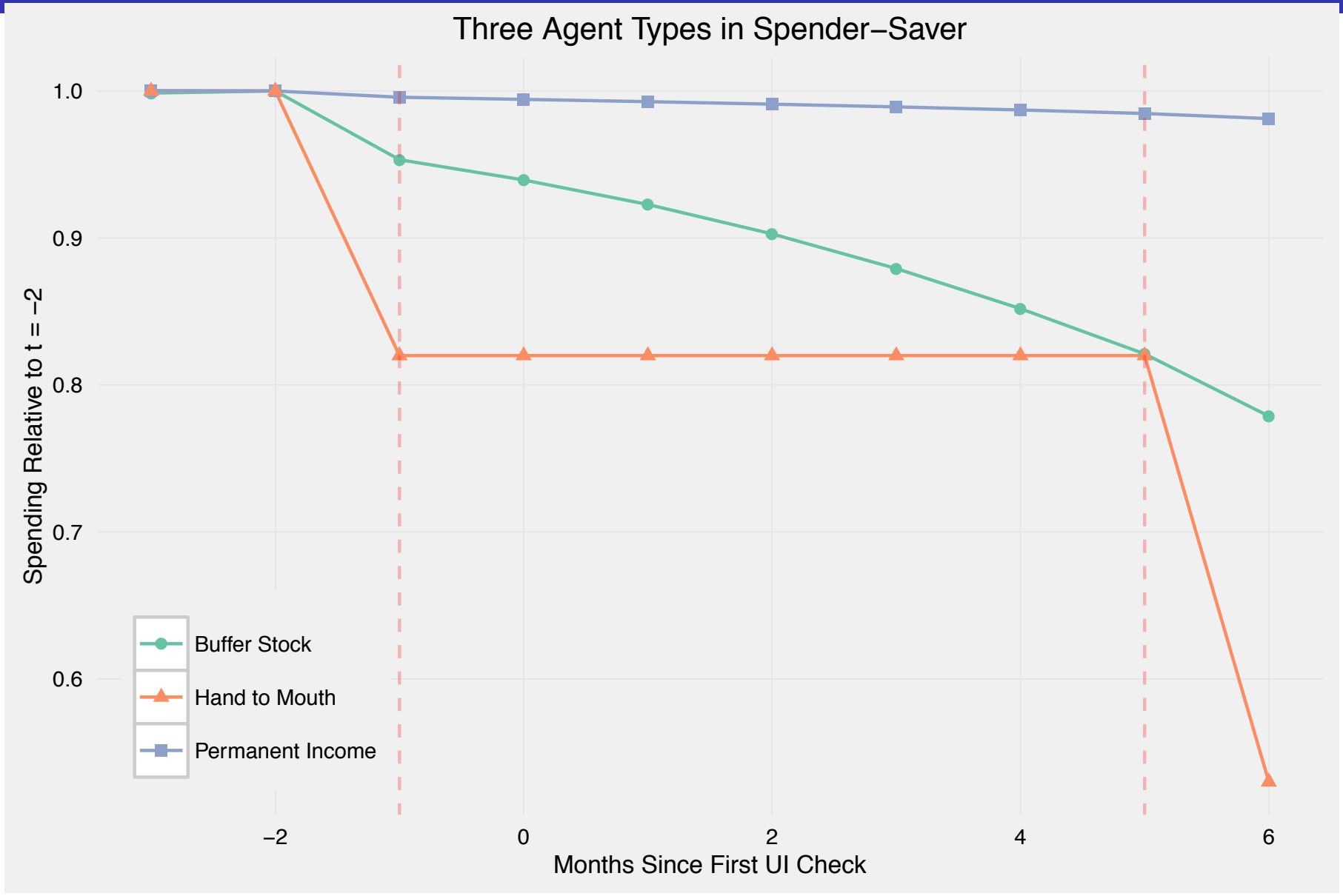
Model: Permanent Income Consumer



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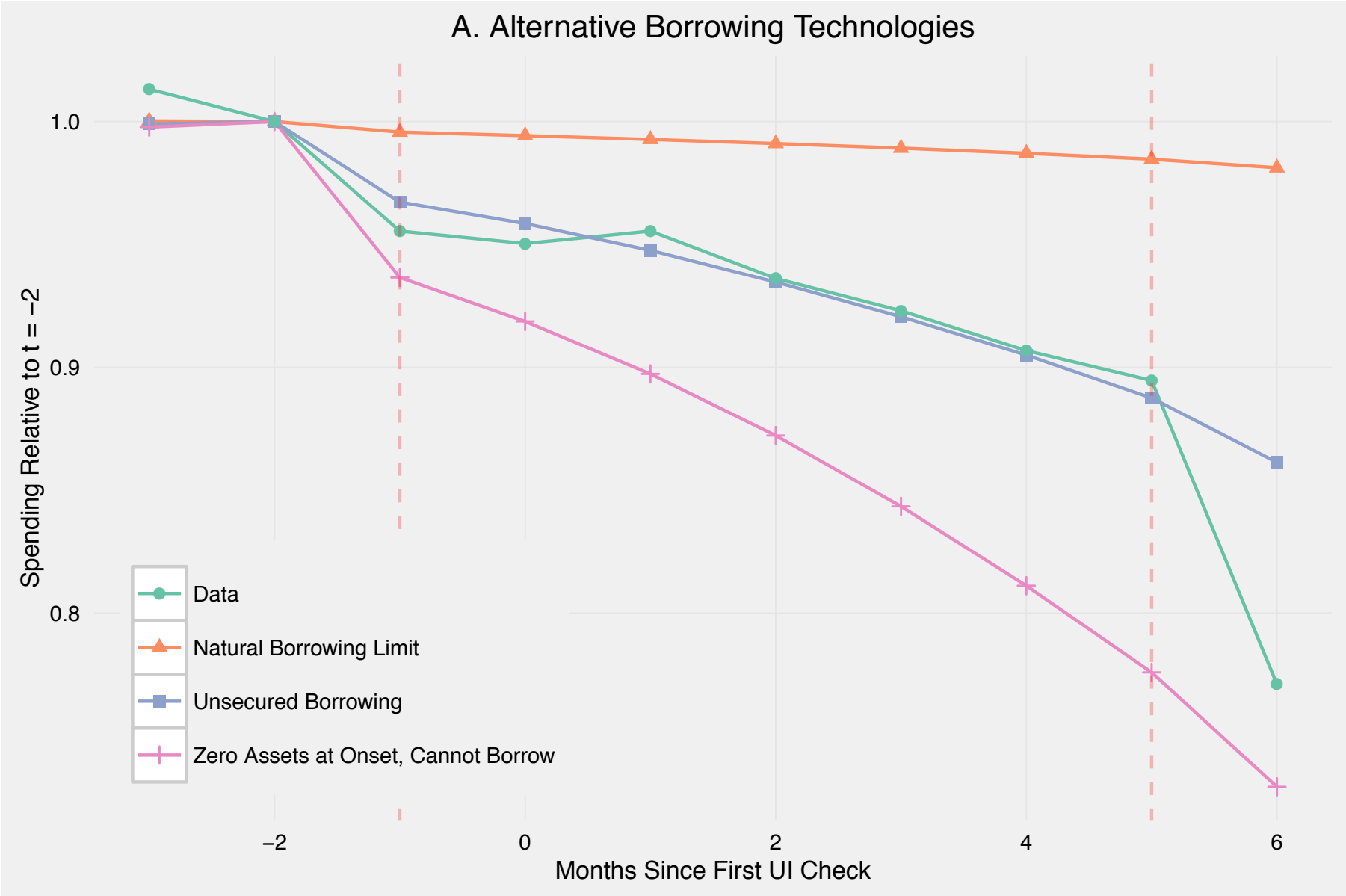
Model: Credit Card Borrowing



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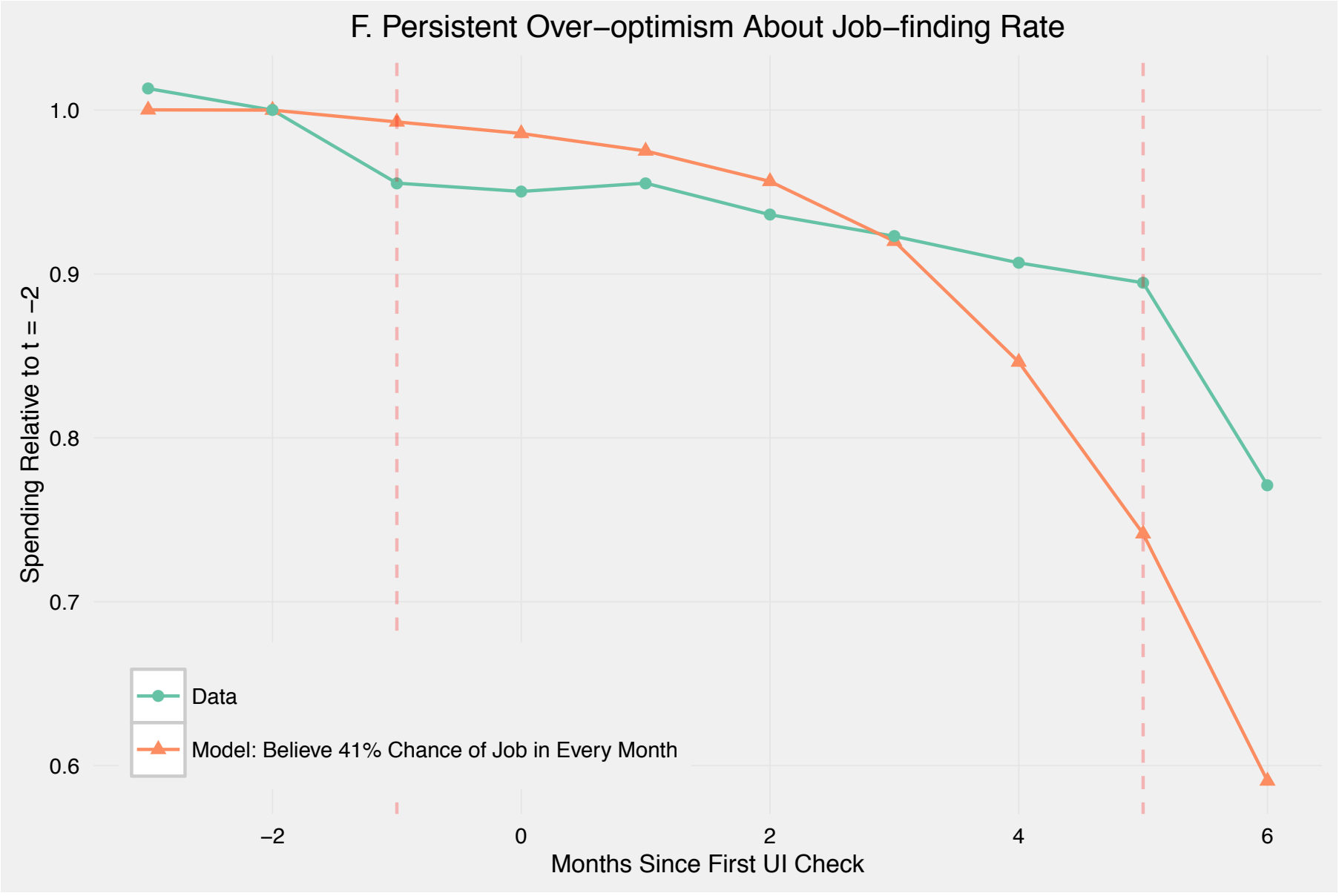
Models with persistent over-optimism



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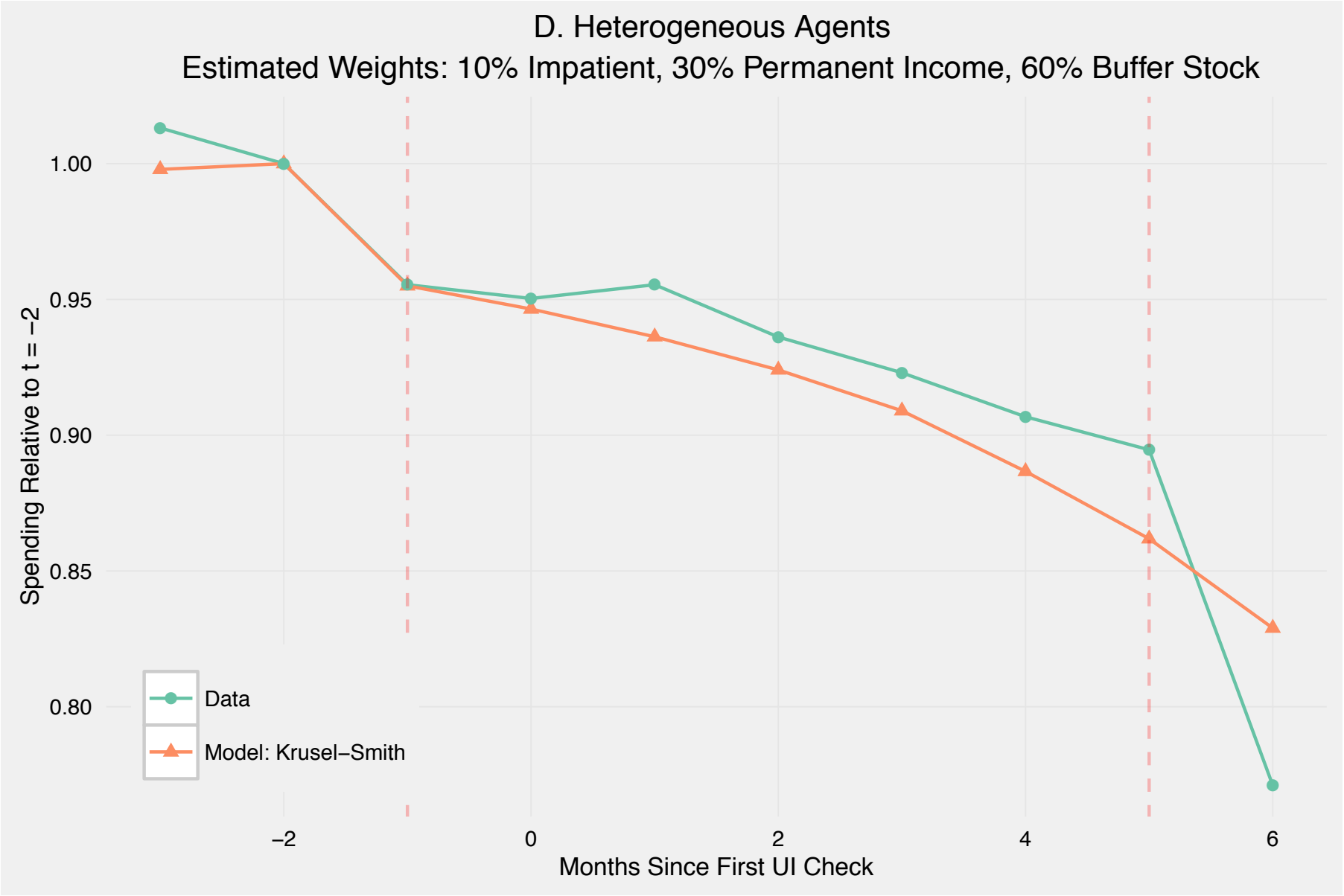
Alternatives: Time Preferences

- Heterogeneous impatience [Krusell and Smith 98, Carroll, Slacalek, Tokuoka and White 15, Parker 15, Auclert 16]
- Three types. Impatient type has $\delta = 0.9$ and no assets.

$$\hat{c}_t(\theta) = w_1 \; c_t^{\text{impatient}} + w_2 c_t^{\text{perm inc}} + (1 - w_1 - w_2) c_t^{\text{buffer-stock}}$$

$$\theta = \arg\min_{\tilde{\theta}} \sum_t (c_t - \hat{c}_t(\tilde{\theta}))^2$$

Heterogeneous impatience slide – 0.9



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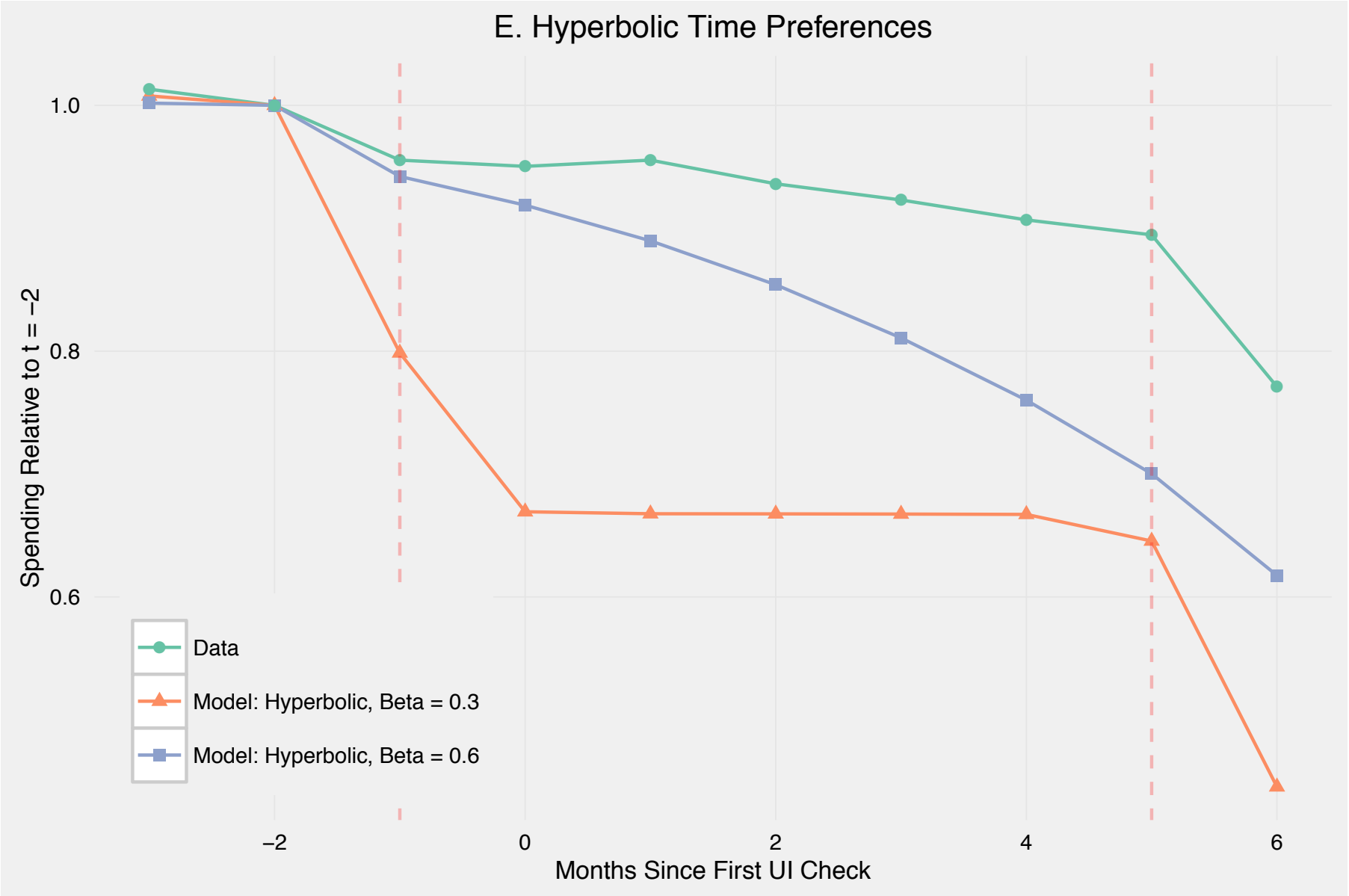
Naive present bias [Laibson 97]

$$\max_{\{c_t\}} E \sum_{n=0}^{T-t} \beta \delta^n u(c_{t+n})$$

- To build intuition, show spending with $\beta = 0.8$ and $\beta = 0.6$
- Estimate β which best fits data

Quantitative Evaluation of Models]



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What Models Can Fit Path of Spending? (Worst to Best)

$$Fit = \sum_t (c_t - \hat{c}_t(\theta))^2$$

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Model	Comment	# Params	Fit
Permanent income	Spending drops	0	1.00
Baseline	Should cut spending before benefit exhaust	0	0.22
Borrow on credit	Spending drop too large at benefit exhaust	0	0.11
Sparse agent	Act as if income loss at exhaust is 71% as big as true loss	1	0.09
Estimate params	Spending drop too large at benefit exhaust	2	0.08
Heterogeneous impatience	Even highly impatient (e.g. $\delta = 0.9$) cut before exhaustion	2	0.06
Sparse agent, estimate δ	Act as if income loss at exhaust is 71% as big as true loss	2	0.03
Spender-saver	25% of agents hand-to-mouth	2	0.03
Over-optimism	68% job-finding rate in exhaust month	2	0.01

Model Technical Details

Concern	Spec Change	Plot
Changes That Don't Matter		
Duration Dependence	$\{e_6, e_7, \ldots\}$: $0.25 \rightarrow 0.15$	▸ Figure
Spending Mismeasured	Spending = All Outflows	▸ Figure
Consumption Commitments	γ: $2 \rightarrow 4$	▸ Figure
Changes That Matter		
Alternative Asset Values	$a_0 = \{0, 12\}$	▸ Figure
Alternative Discount Factor	$\beta = \{0.98, 1\}$	▸ Figure

Model Failure: Too Little Liquid Asset Holdings

	Liquid Asset Holdings
Data: Survey of Consumer Finances	0.7 months
Model: Match drop through exhaustion	0.8 months
Model: Steady state a	2.4 months
Gournichas and Parker (02)	$\sim$12 months

Implications for UI Policy

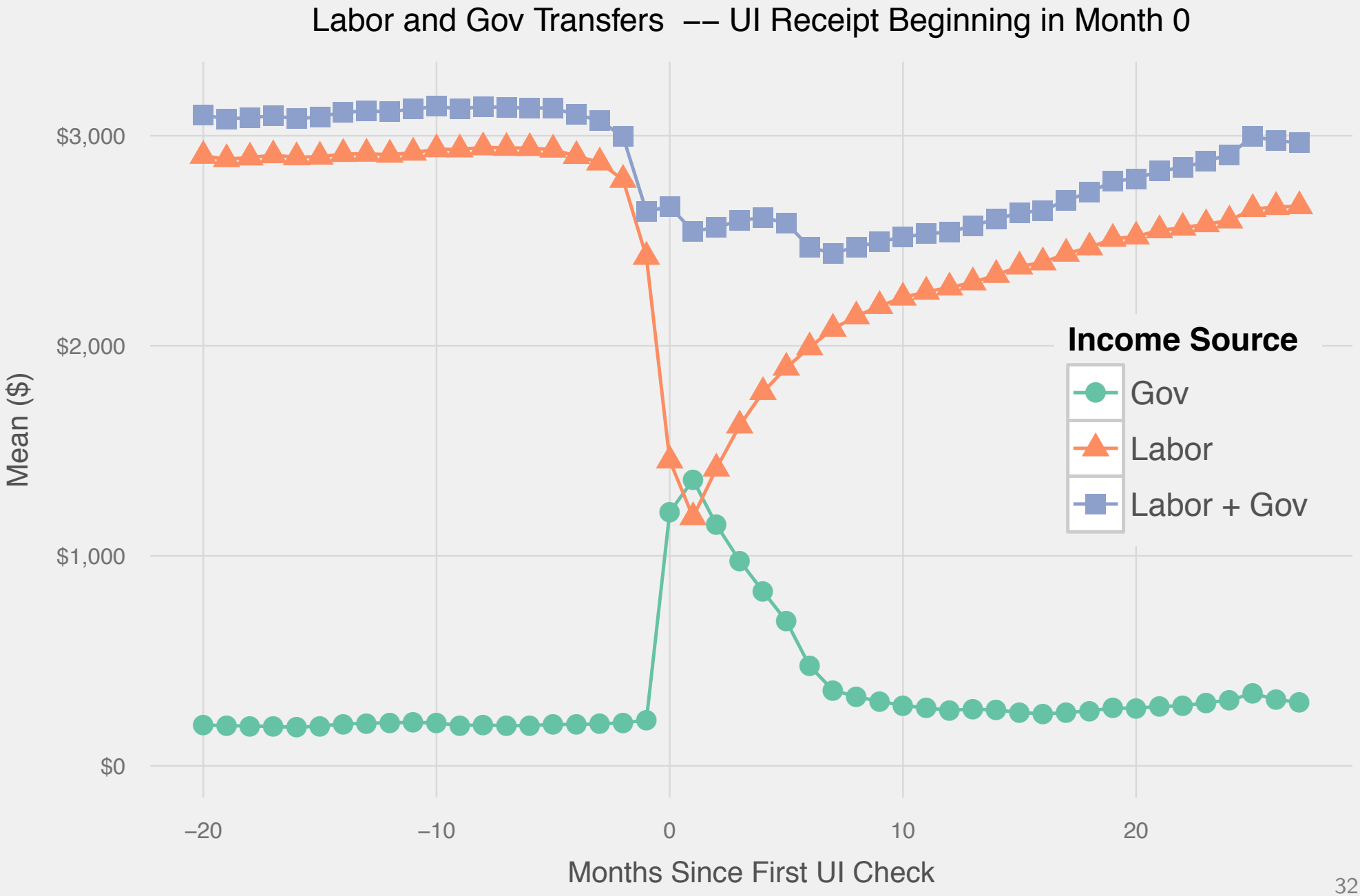
- Fact: UI surprisingly important for consumption
  - Increase UI to help families smooth
  - Increase UI for macro stabilization

- Fact: People who cut spending more find a job faster. Some people won't search until benefits are exhausted.
  - Decrease UI

Implications beyond UI Policy

- Fact: Spending drops sharply at benefit exhaustion
  - Policy: Help families prepare for exhaustion
- Fact: People who cut spending more find a job faster. Some people won't search until benefits are exhausted.
  - Policy: Encourage "worrying" early on to motivate job search
- Fact: Spending very sensitive to income
  - Policy: Encourage larger buffers. Dedicated accounts?

Empirics. Onset. Family Income Recovers Quickly



Empirics. Onset. Concept Differences Explain Quick Income Recovery

Jacobson, LaLonde and Sullivan (93) report a 30% permanent income loss for displaced workers. Why?

- See also Couch and Placzek (10), von Wachter, Sullivan and Manchester (09), Davis and von Wachter (11), Jarosch (15), Flaaen et al. (15)

Sources:

1. Gov't transfers
   - Recovery of family labor income matches SIPP ▸ Figure
2. Family income vs individual income
3. All UI recipients vs high-tenure ▸ JLS Figure ▸ Back

Empirics. Why Drop at Onset? Work-Related Expenses

Steps

1. Identify expenditure categories containing work expenses c_{work}
   - Method: drop at retirement for people with enough assets to smooth

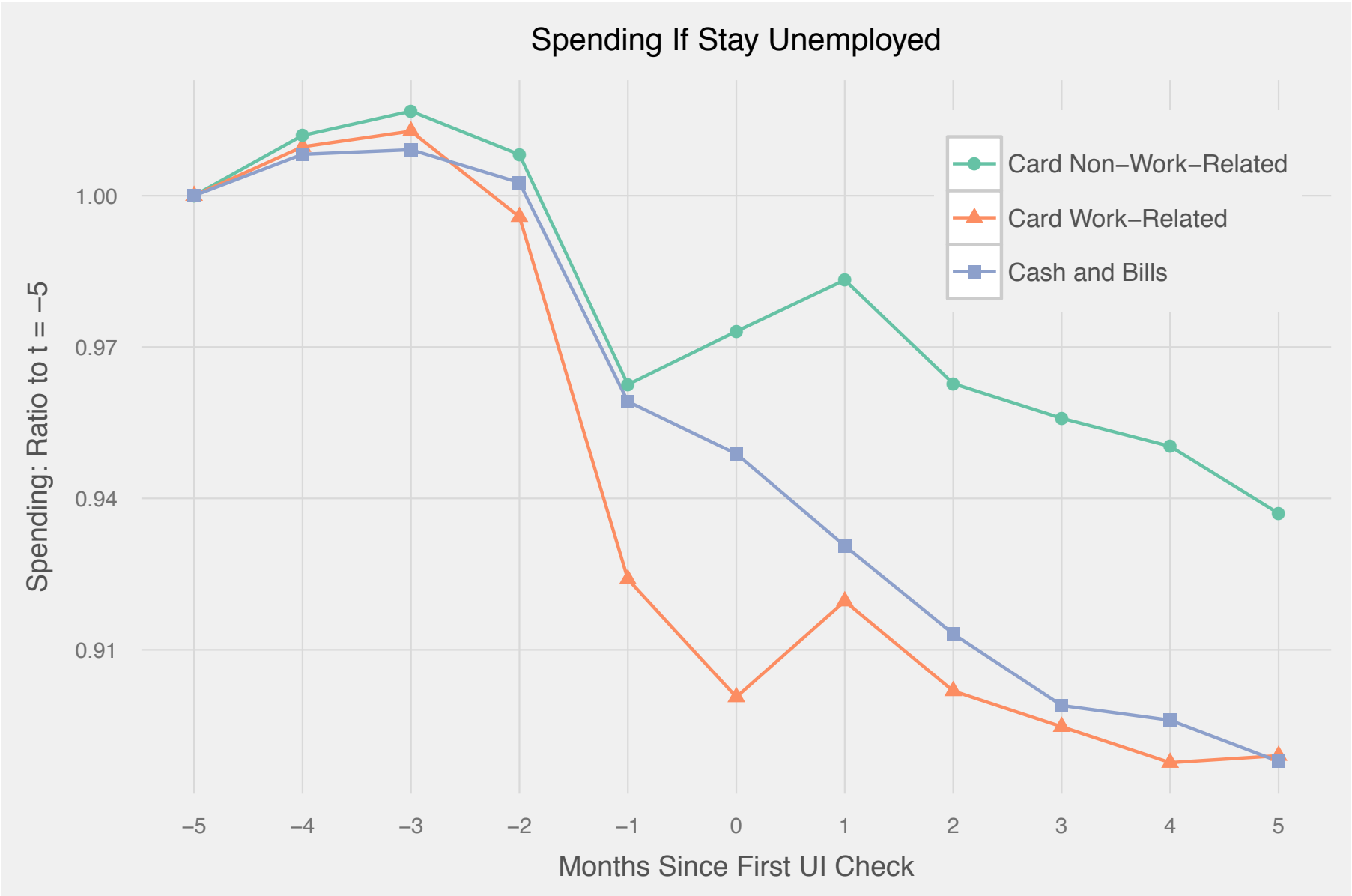
Aguiar and Hurst (13)	$\Delta c >$ *median* at retirement
Food Away From Home	Food Away From Home
Transportation	Fuel, Auto, Flights/Hotels
Clothing	Department Stores
	Small Durables, Online
31% of nondurables	29-41% of nondurables

2. Estimate impact of change in employment status ▸ Details

$$E(c_{work}(y, e = 1)) - E(c_{work}(y, e = 0))$$

▸ Back

Spending At Onset By Expenditure Category



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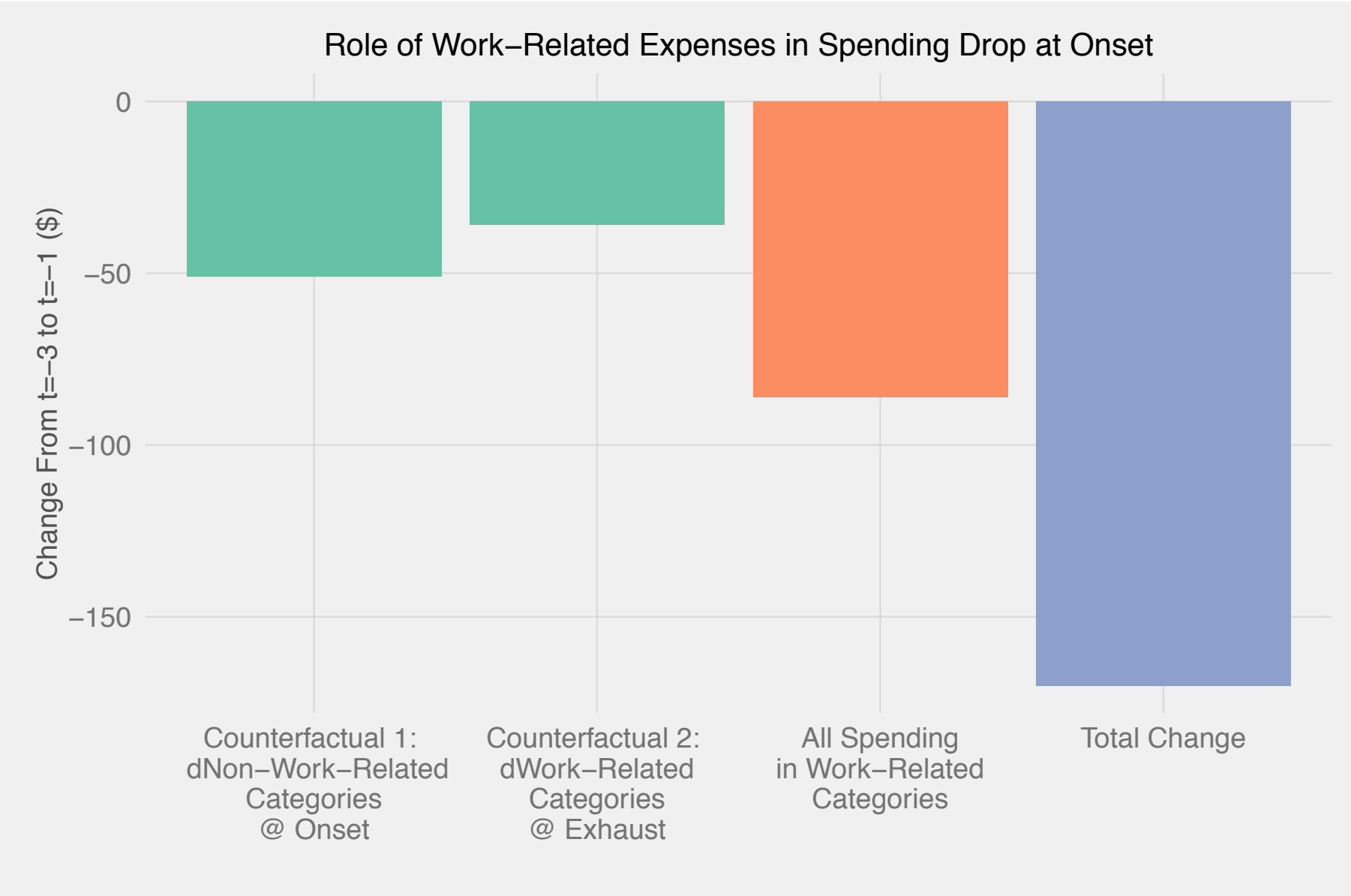
Empirics. Onset. Work-Related Expenses ≈ 1/3



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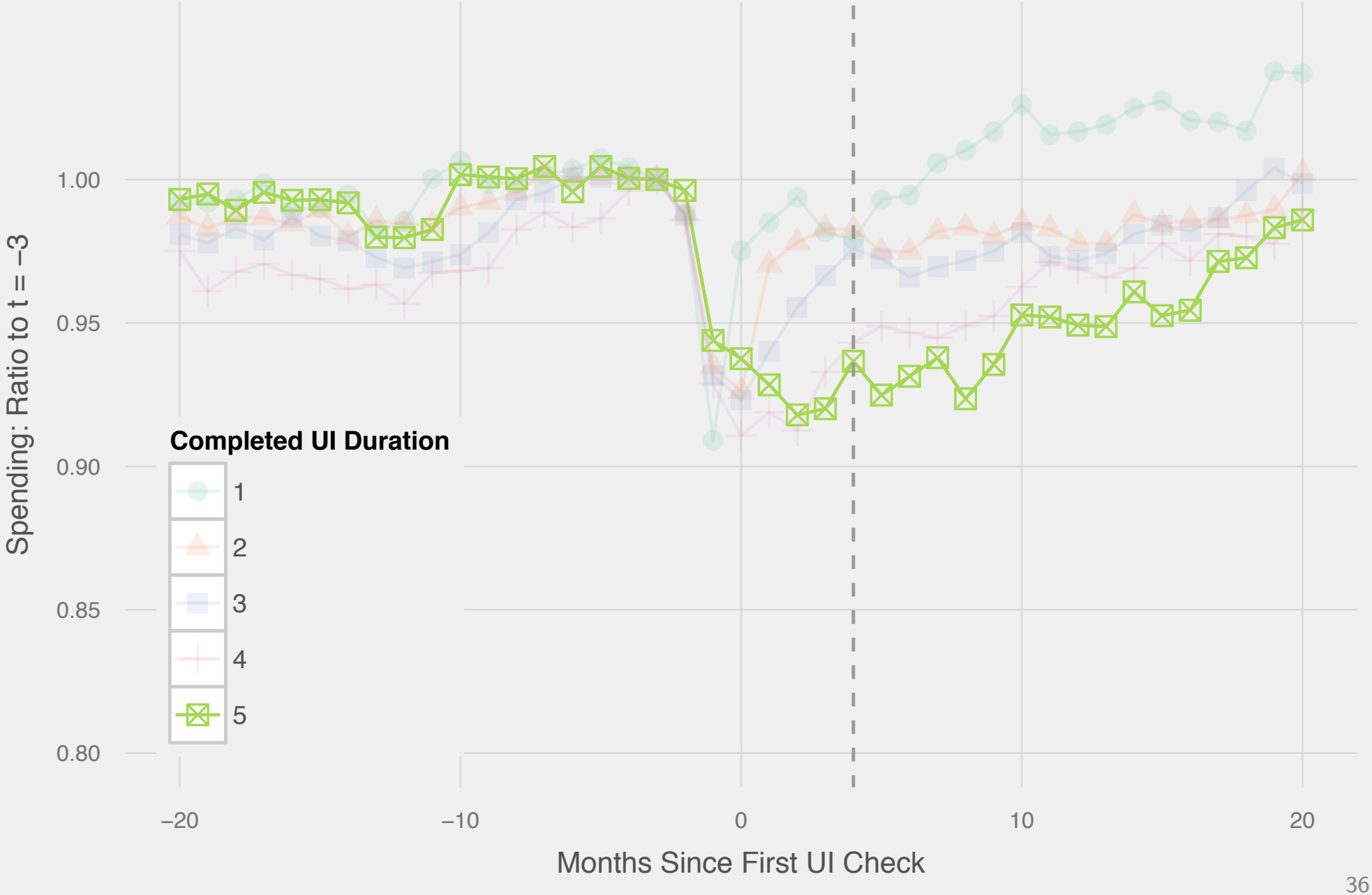
Spending Change at Reemployment



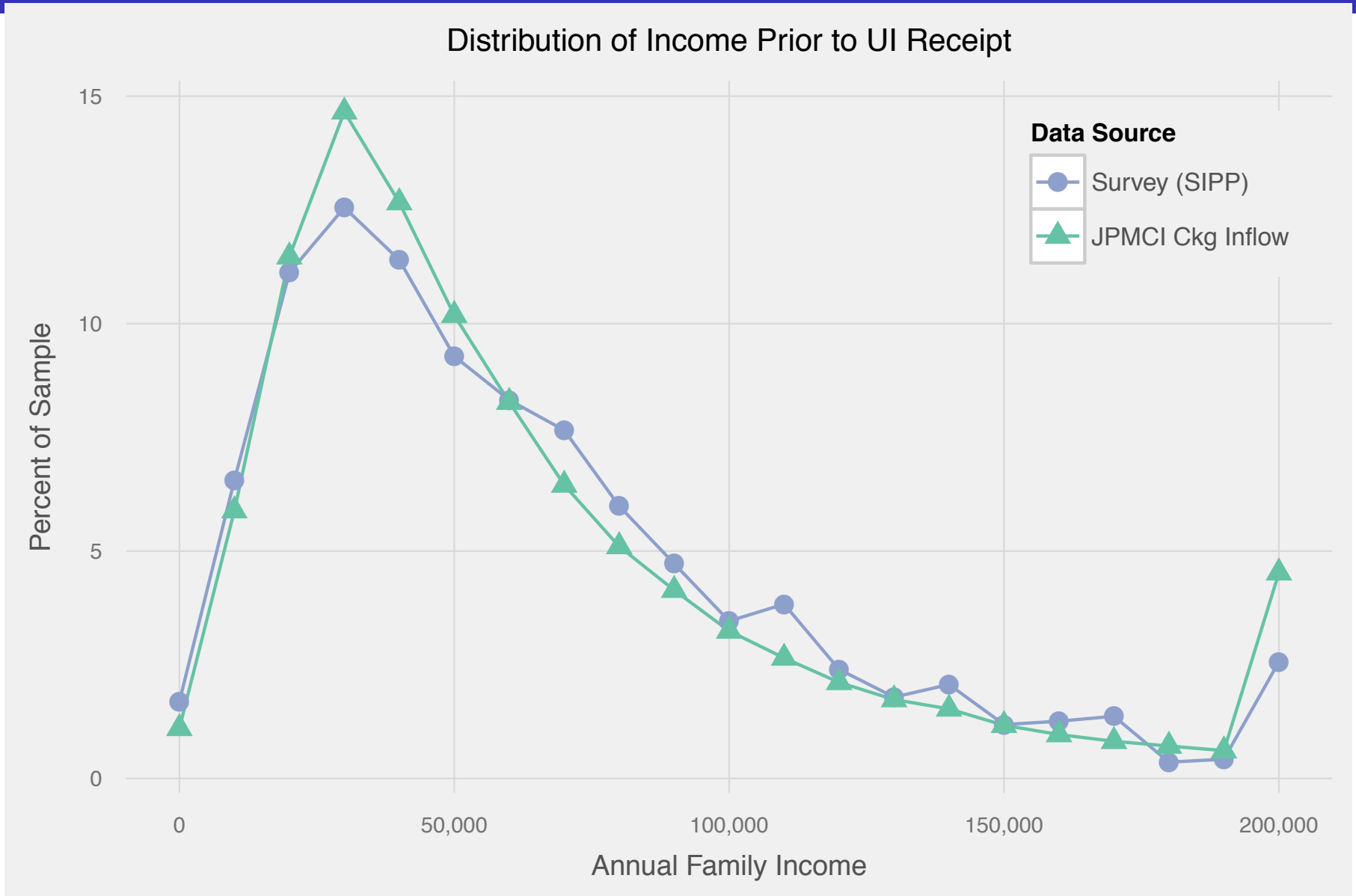
Families Smooth Income Loss Over Several Months

Reemployment Spending Recovery Details

Focus on families that get UI for exactly three months

1. Prior work overstated spending drop during unemployment ▸ Figure
2. Spending recovers slowest for low-asset families ▸ Figure

Bank UI Families Have Incomes Similar to SIPP



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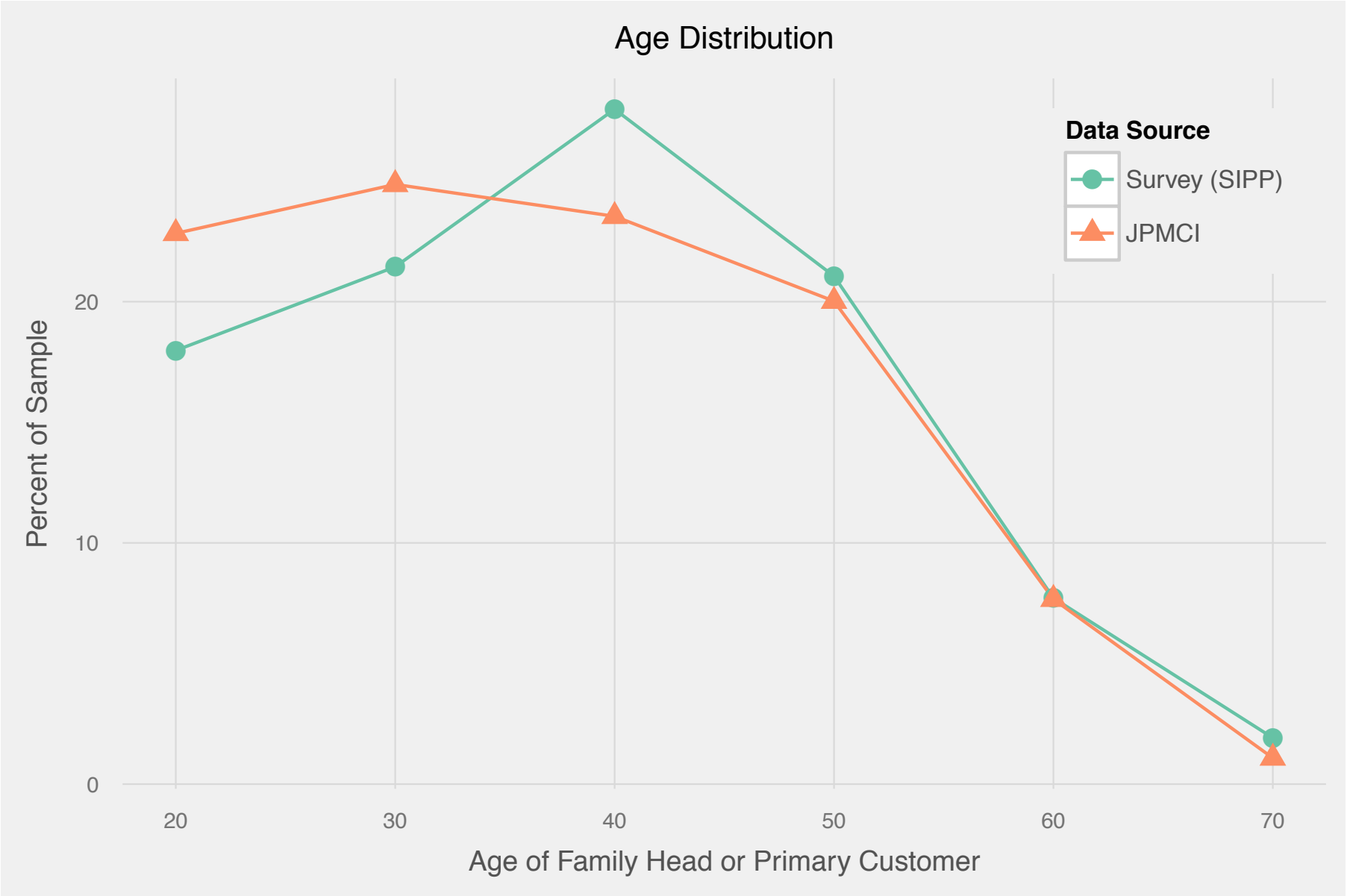
Representativeness by Age



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Representativeness by Labor Income Before and After Separation

	Before Sep	Drop at Sep	Source
External Benchmark			
(1) Labor Share of Total	85%	52%	Rothstein and Valetta (14)
(2) Use Payroll DD	80%	80%	SCF
(3) = (2) * (1)	68%	42%	
Bank	69%	38%	

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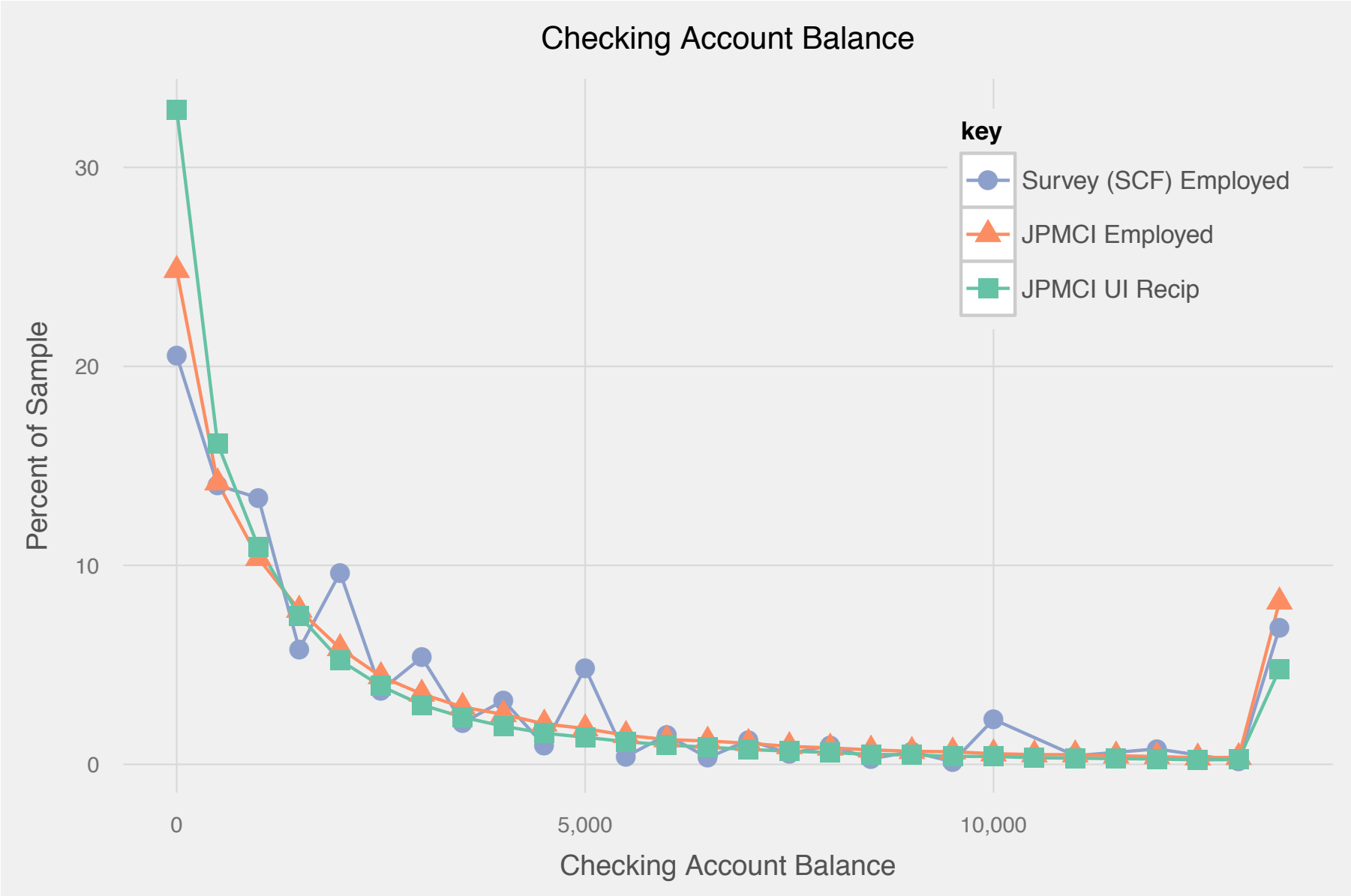
Assets External Benchmark



Medians: SCF Employed $1,500, Bank Employed $1,520, Bank UI $1,060

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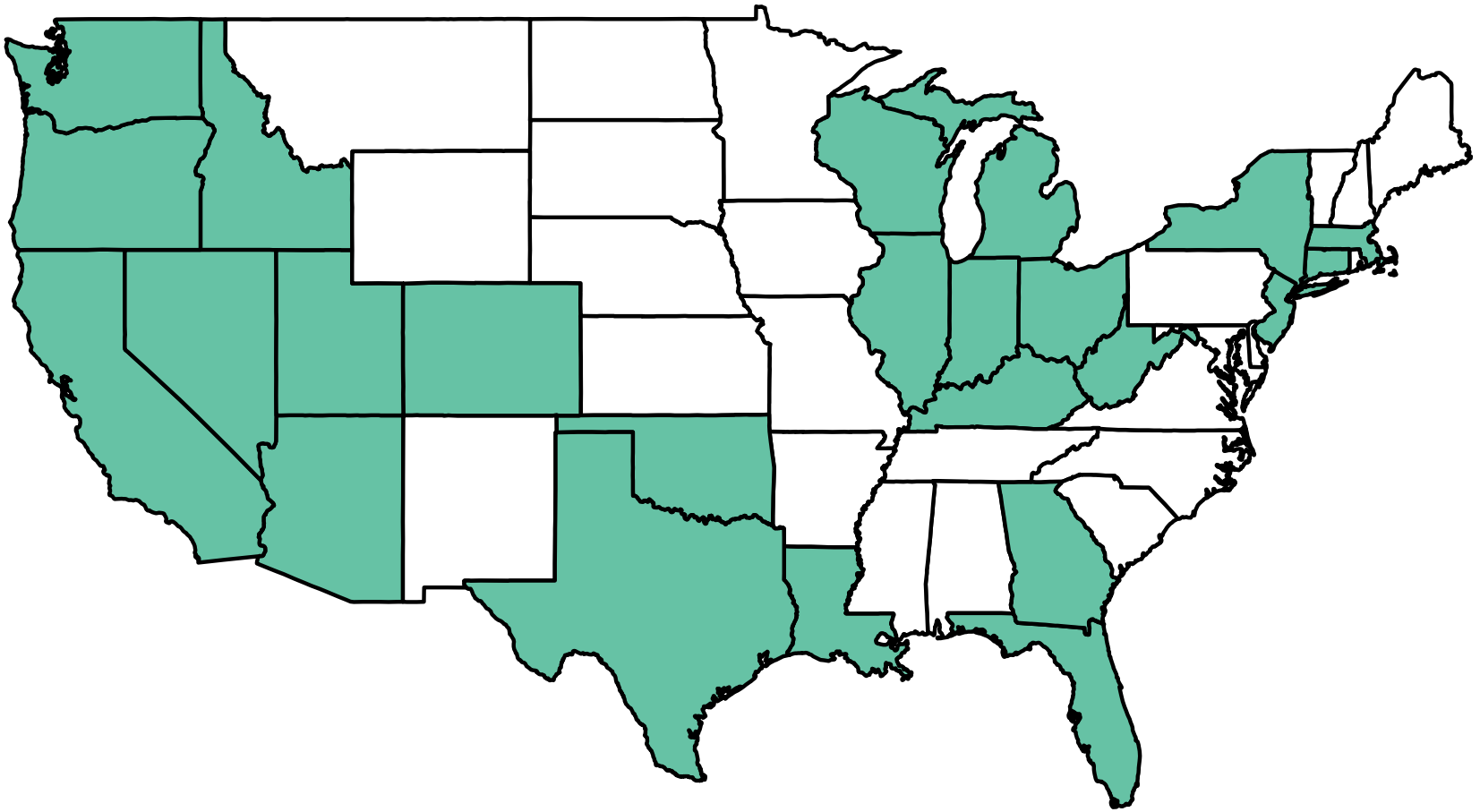
Chase Branch Footprint



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Monthly Spending Compared to External Benchmarks

Category	Bank	Ratio to CEX	Ratio to BEA
Food At Home	478	1.44	0.82
Food Away From Home	291	1.33	0.62
Utilities	371	1.19	–
		Ratio to SCF	
Mortgage	1536	1.12	
Auto Loan	484	1.04	
Credit Card	1010	0.63	

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Benchmarks: Receipt of UI Direct Deposit

External Benchmarks		Source
Weekly UI payments	2.9 million	FRED
Consumer Units	125 million	CEX
Consumer units getting UI	2.2%	–
UI recipients getting DD	45%	Natl Consumer Law Center
Consumer units getting UI DD	1.0%	–
Bank families getting UI DD	0.8%	

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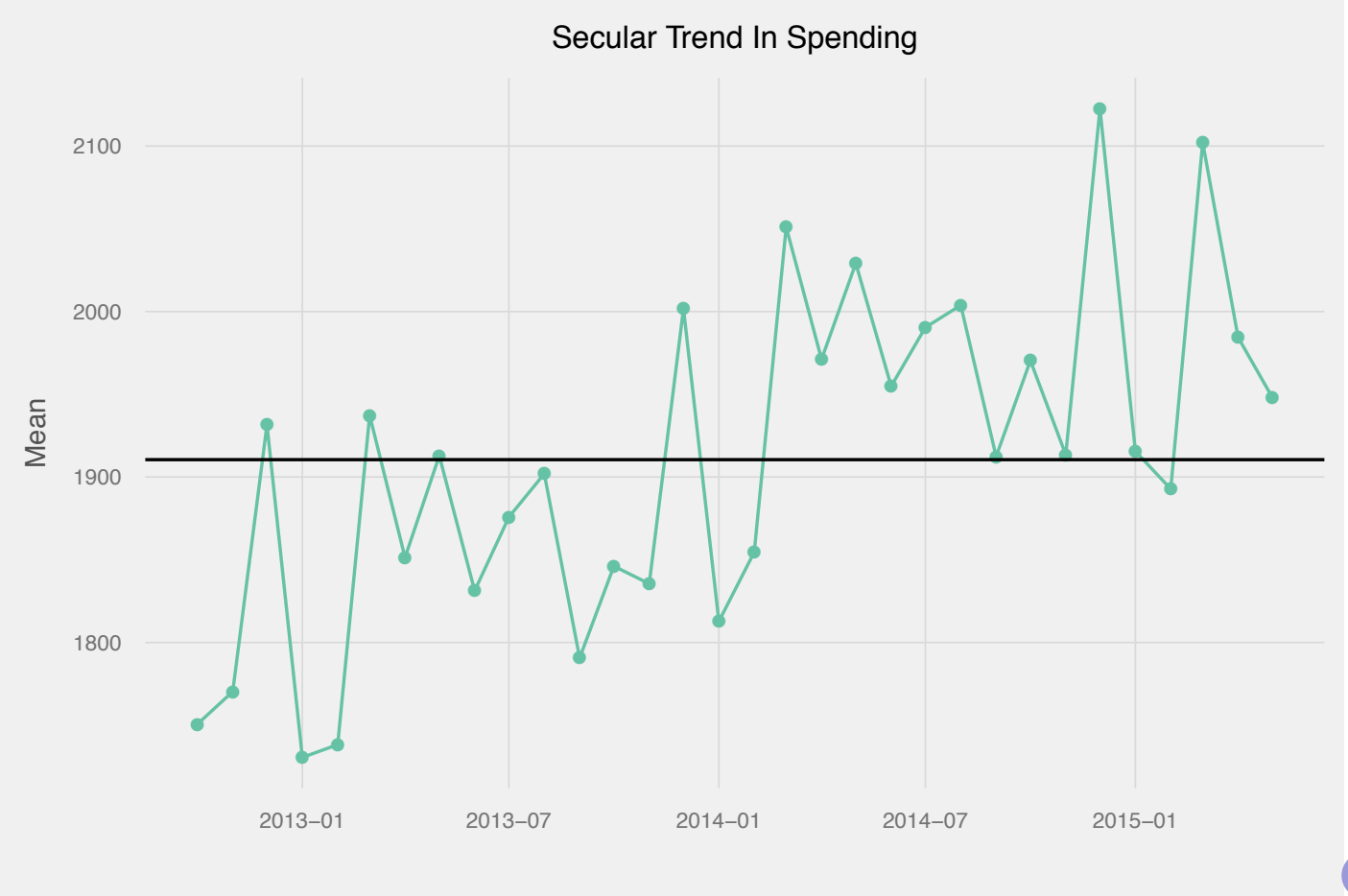
Control Group Nondurables Spending Rises $7/month



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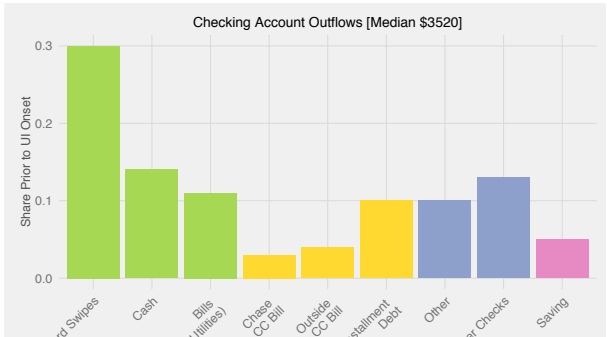
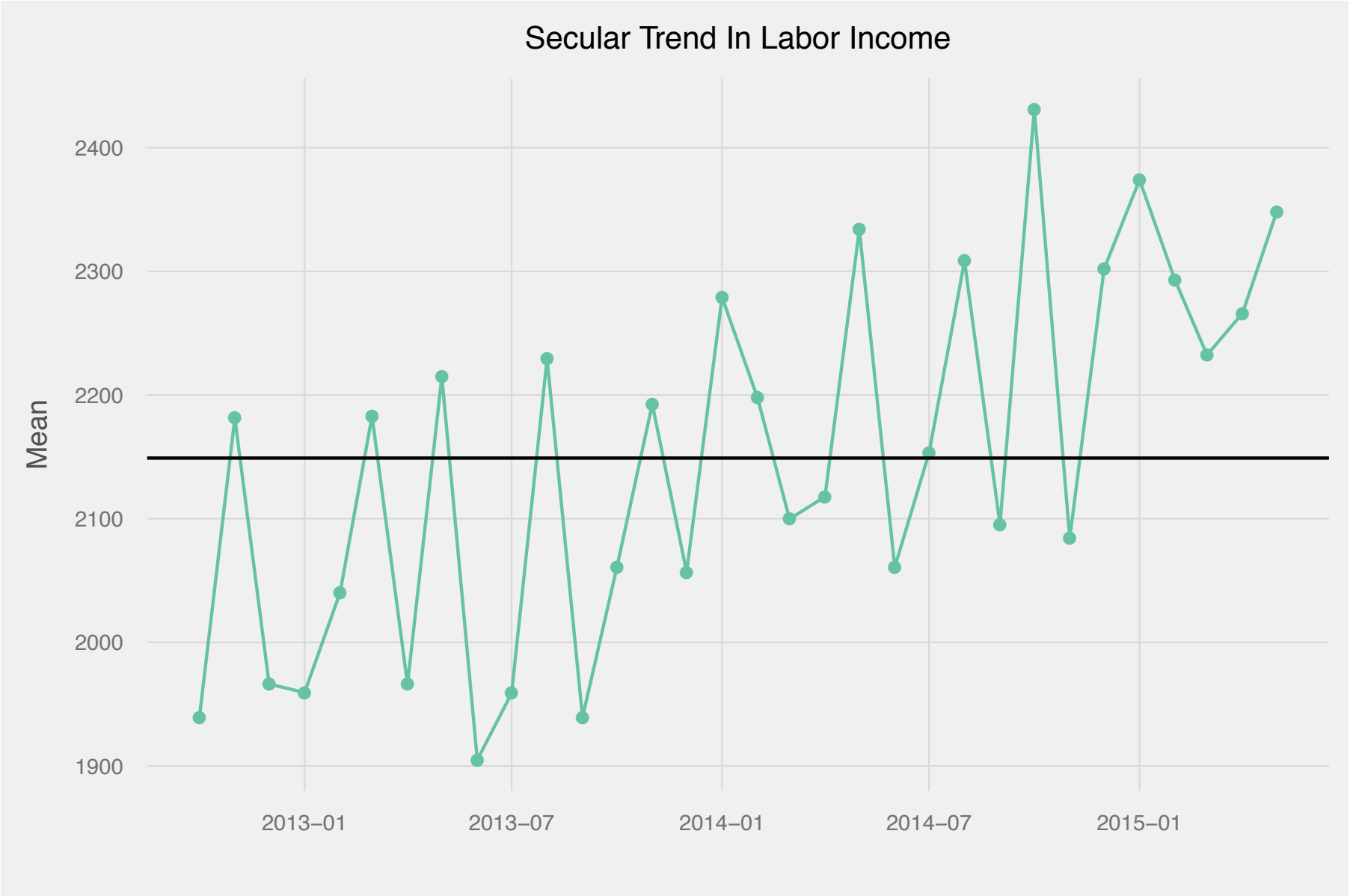


Control Group Income Rises $15/month



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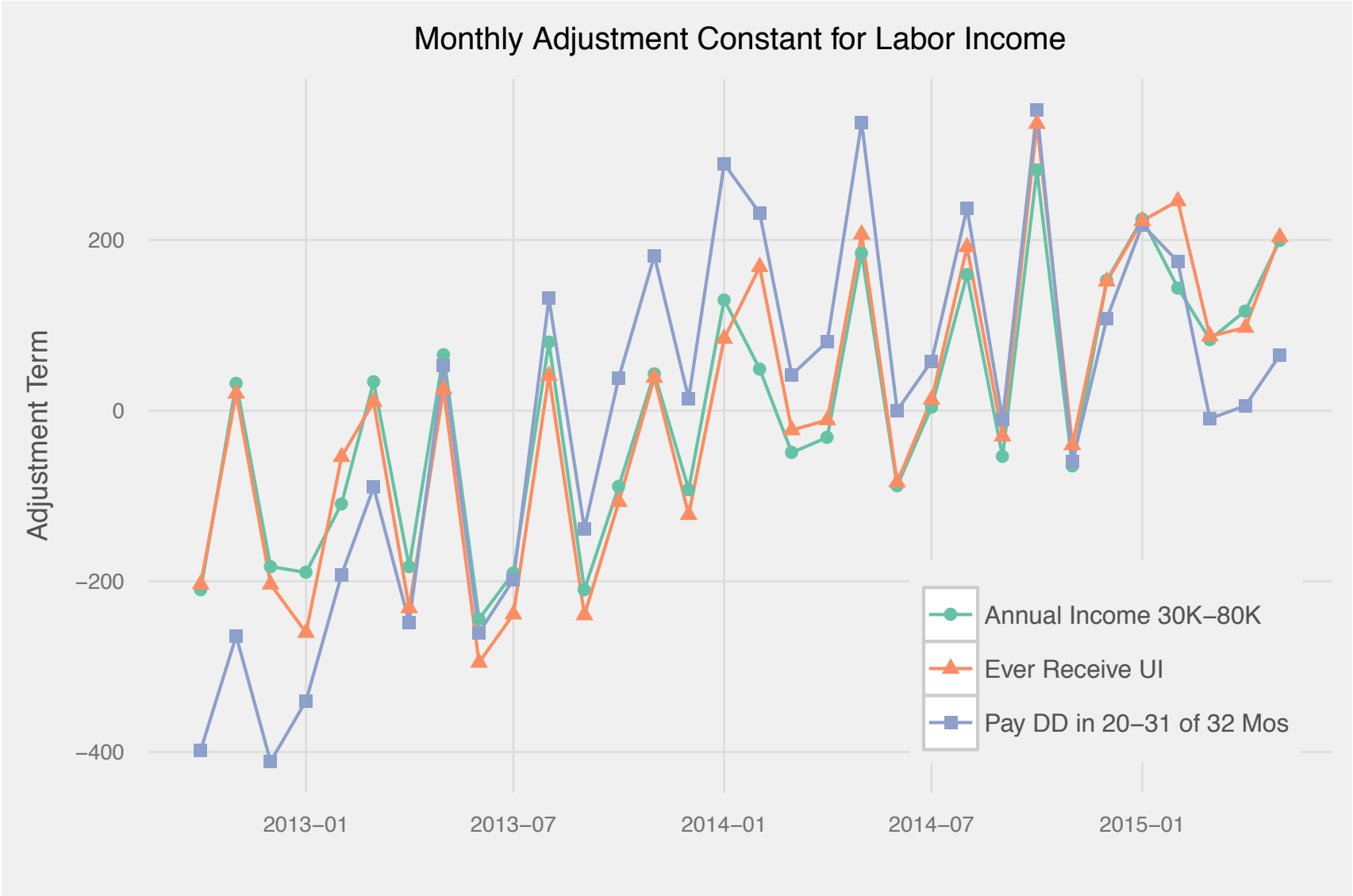
Calendar Adjustment for Income



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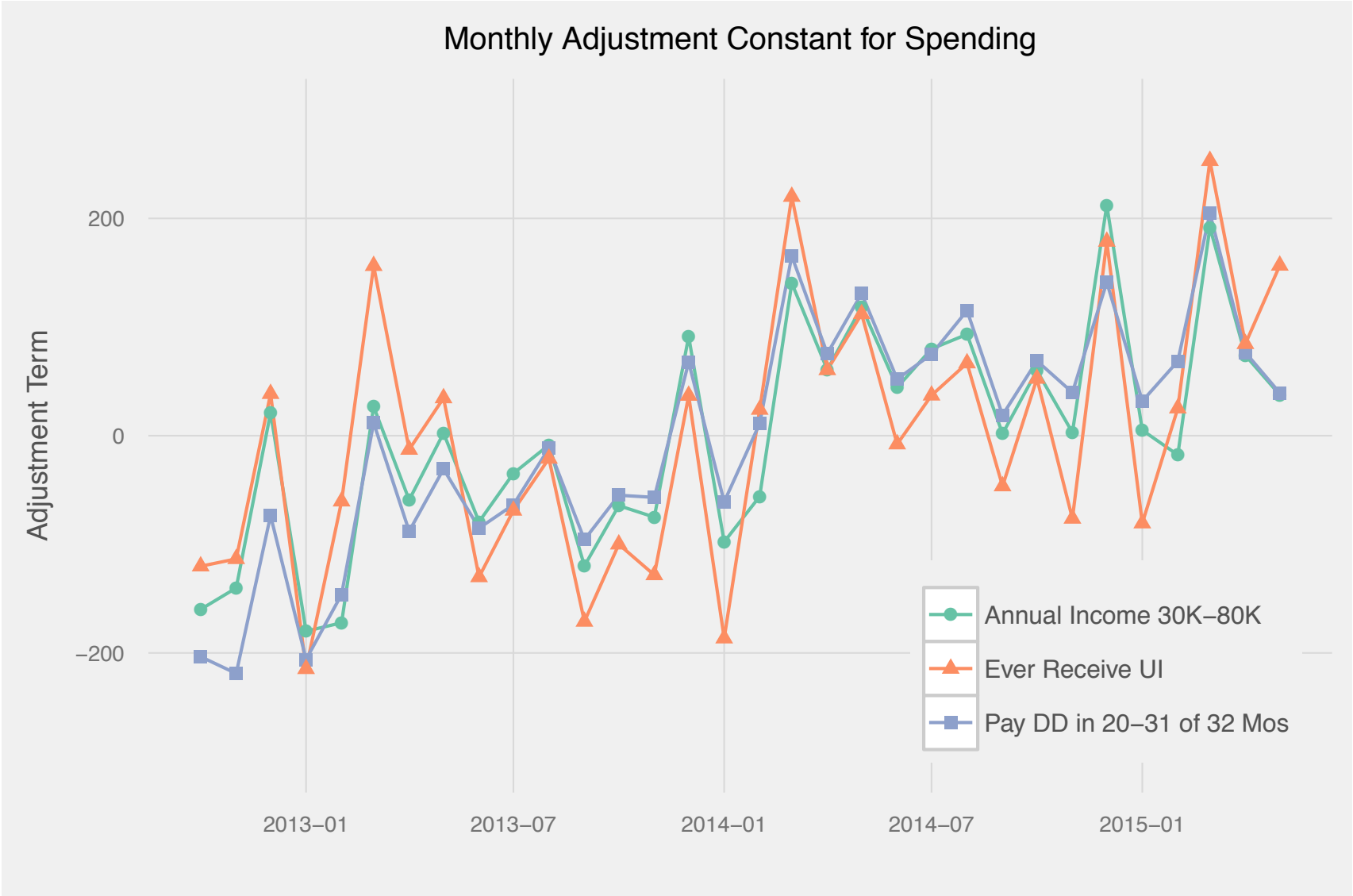
Calendar Adjustment for Spending



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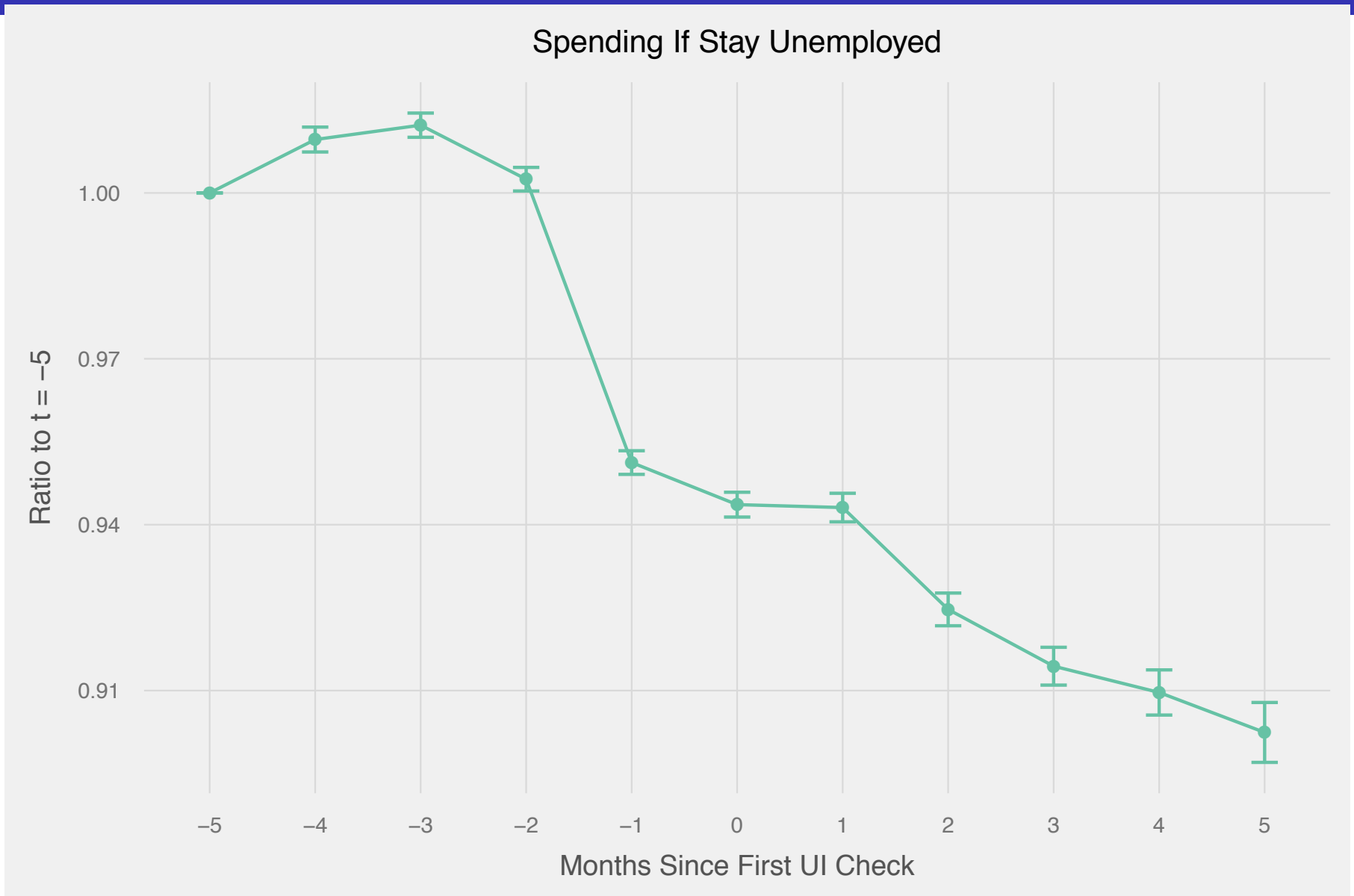
Empirics: Introduction – Families Remaining Unemployed



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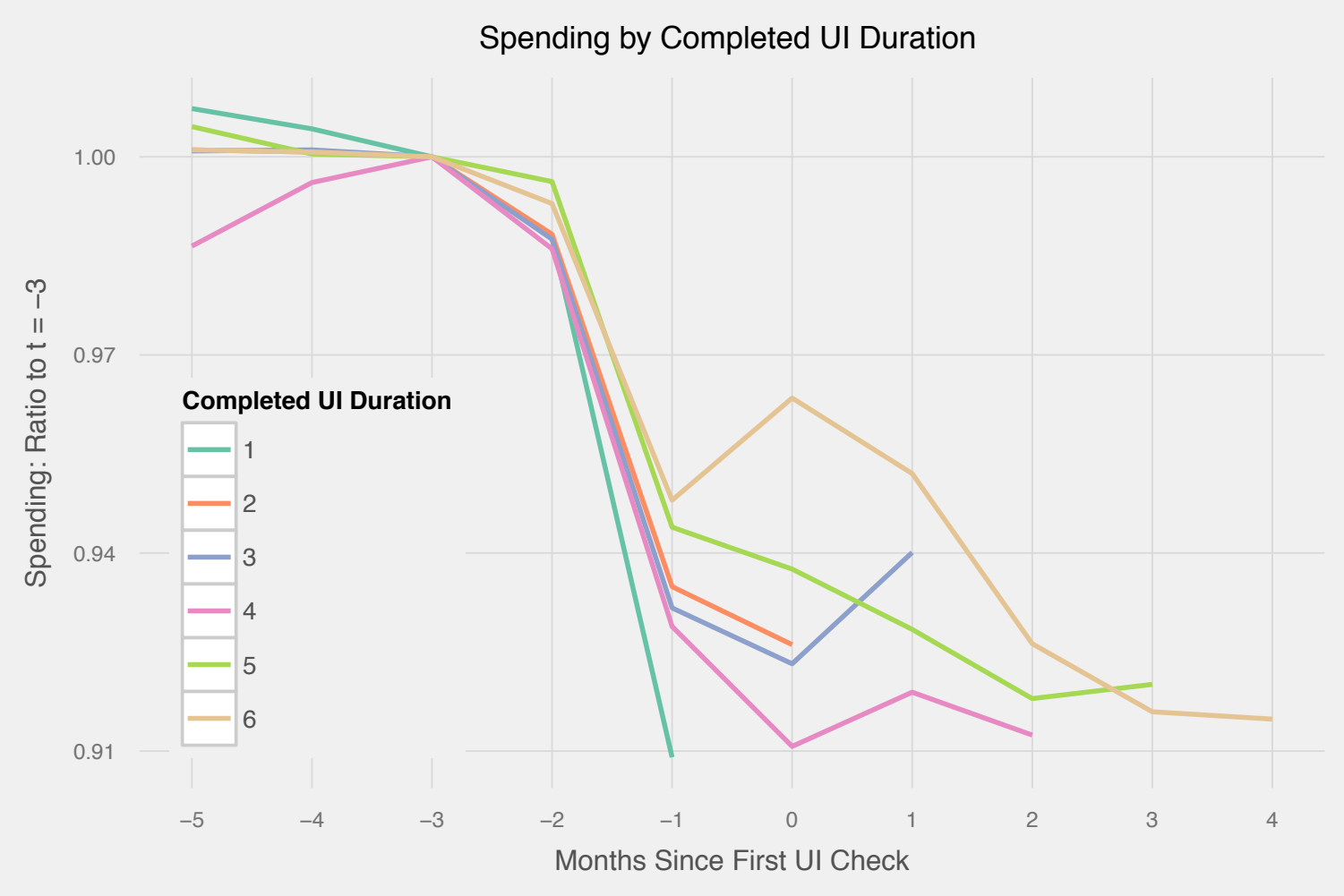
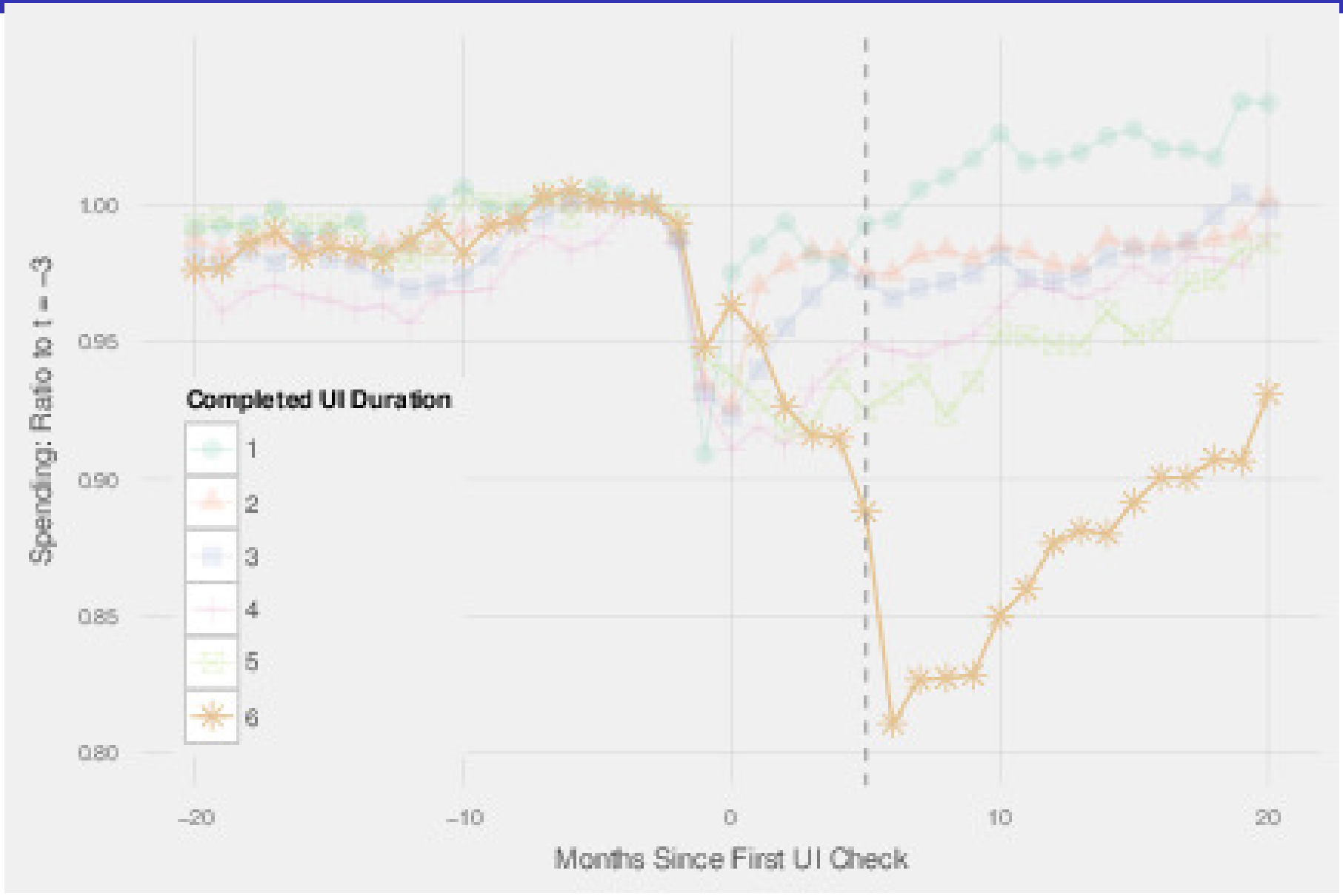
Equation for Spending Drop



$$\Delta c_t = \frac{1}{n} \sum_{i \in \text{UI Duration} > t} c_{i,t} - c_{i,t-1}$$

Nonparametric spending series



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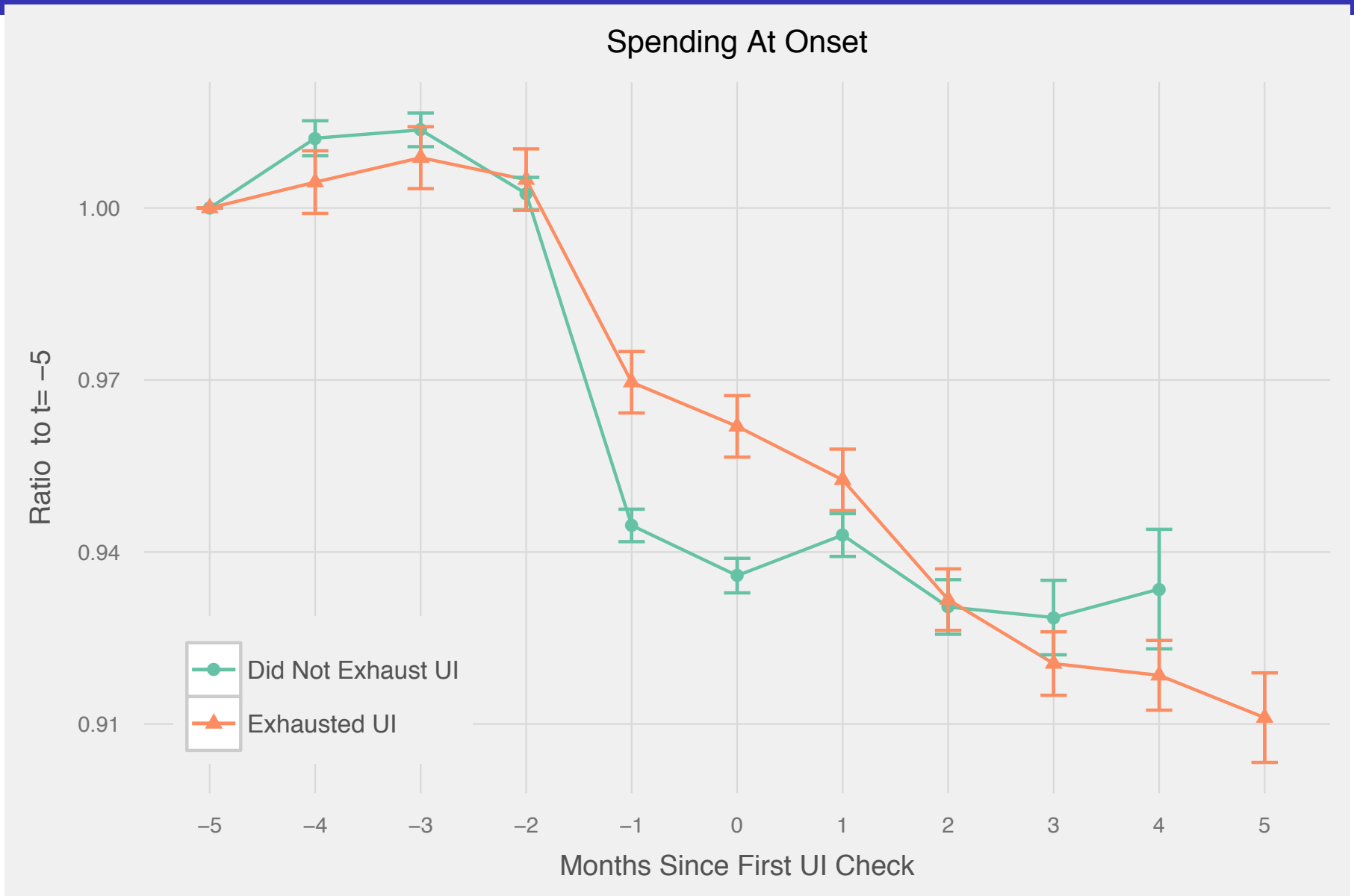
Exhausted vs Did Not Exhaust



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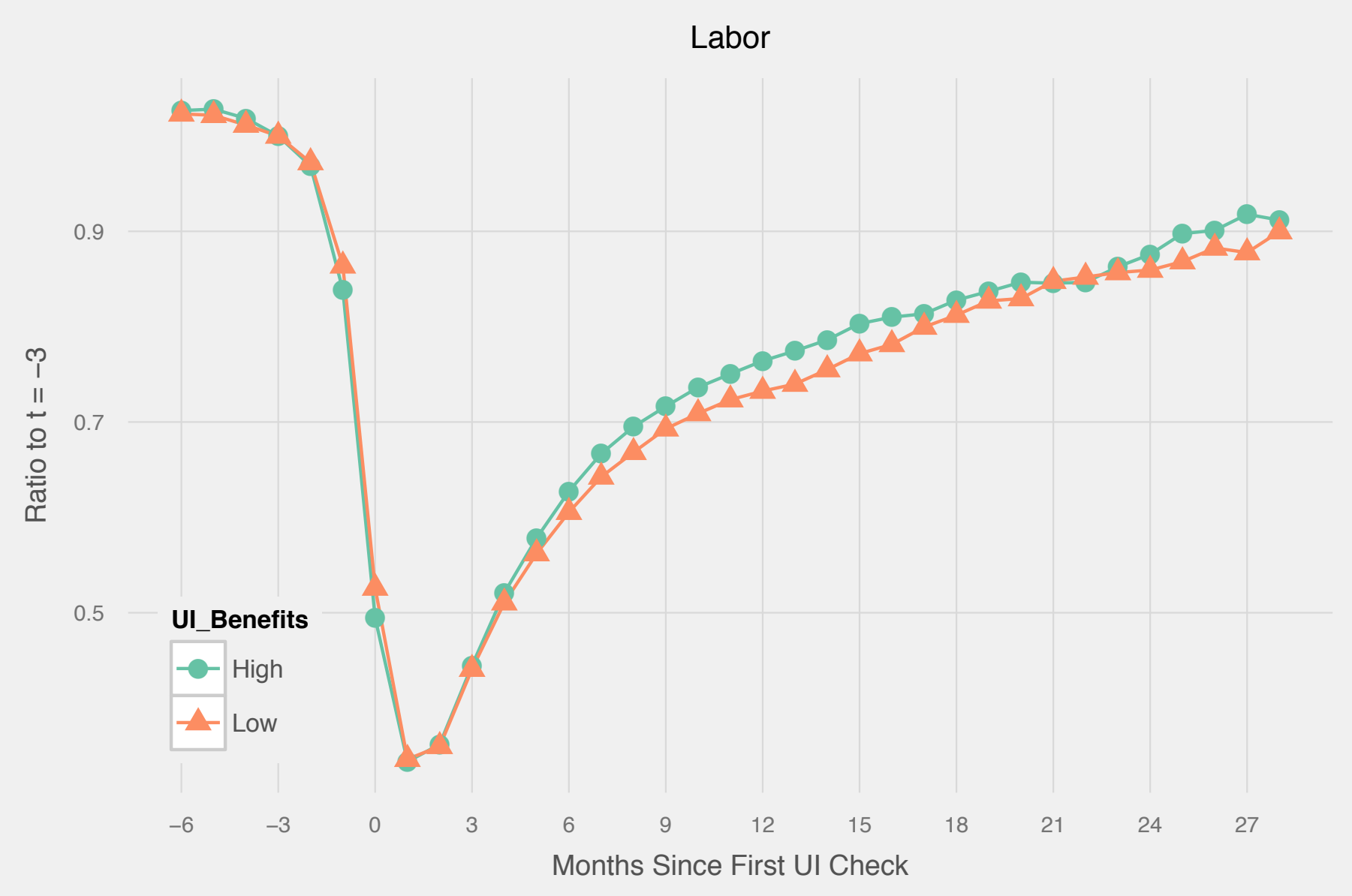
Labor Income in high vs low benefit states



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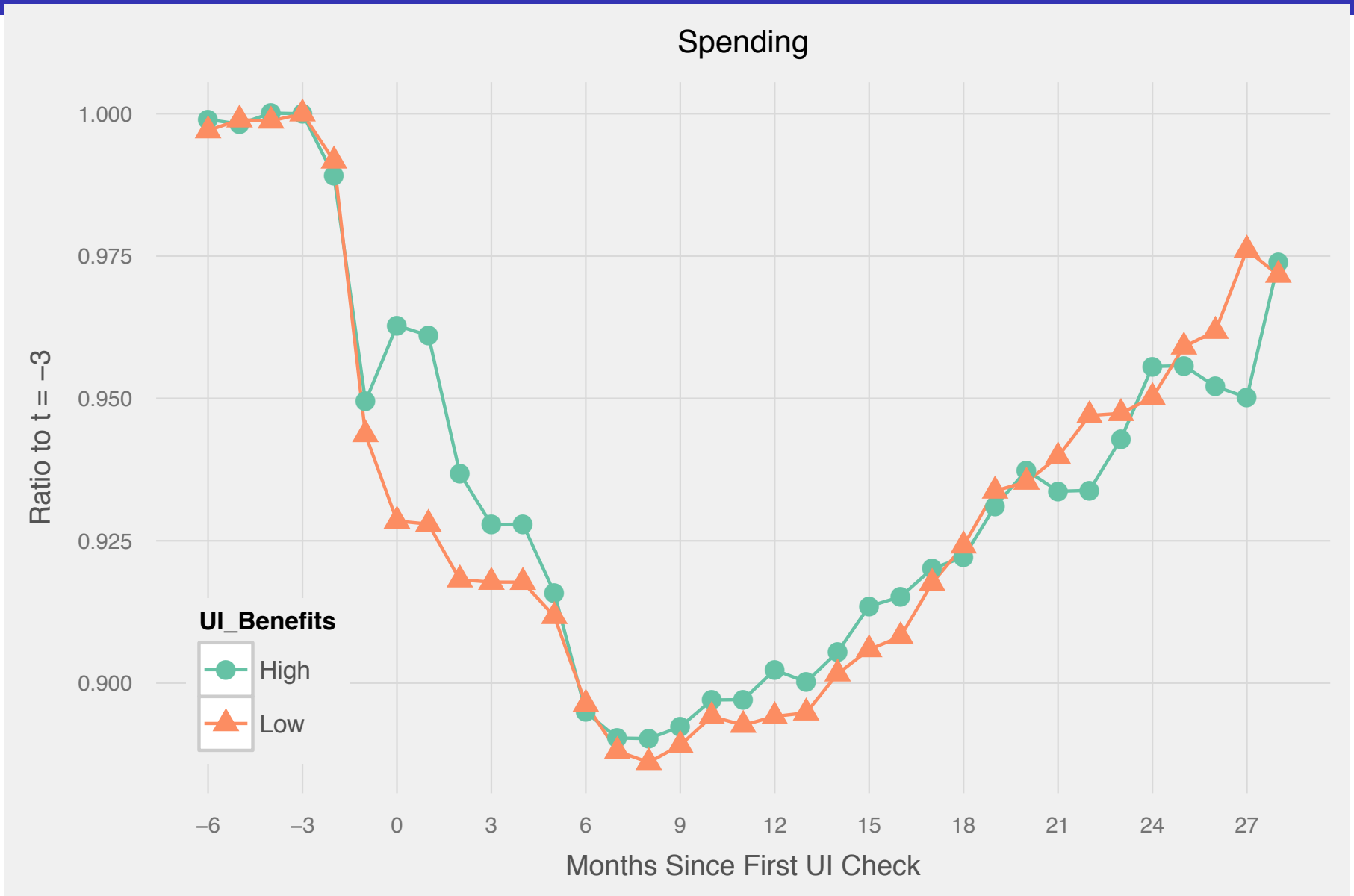
Spending (long-term) in high vs low benefit states



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Spending At Unemployment Onset

	Pre-Onset ($t-3$)	Post-Onset ($t-1$)	Δ%
Cut a Lot			
Any Student Loan	12.4%	10.9%	-16%
Food Away From Home	$185	$164	-11%
Auto	$181	$162	-11%
Any Doctor Copay	24.6%	22.4%	-9%
Cut a Little			
Retail	$358	$337	-6%
Food At Home	$300	$291	-3%
Any Auto Loan Pay	17.0%	16.6%	-2%
Stable			
Utilities	$164	$163	-1%
Any Entertainment	43.7%	44.3%	1%
Any Mortgage Pay	15.0%	15.3%	2%

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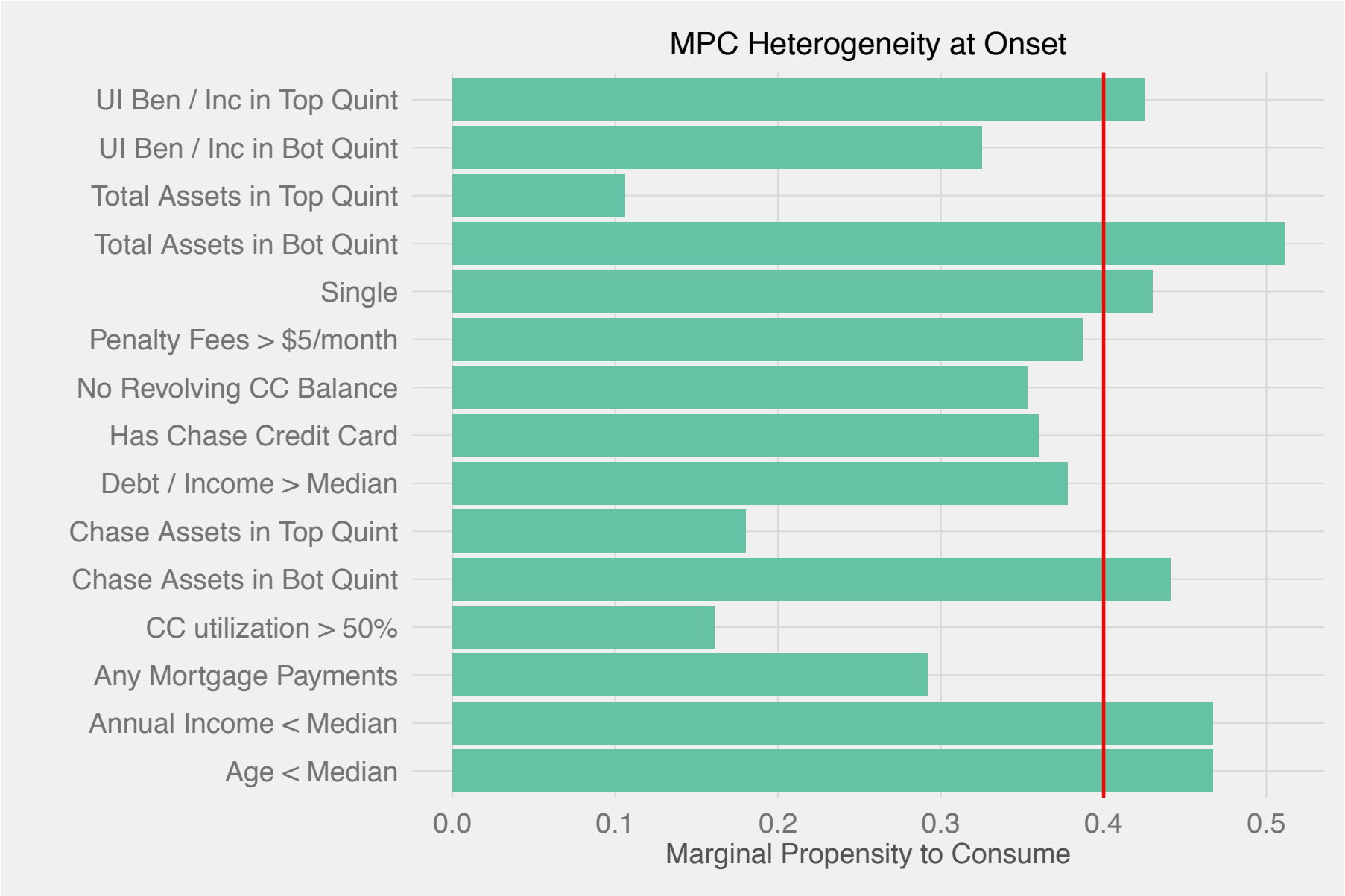
MPC Heterogeneity at Onset
UI Ben / Inc in Top Quint
UI Ben / Inc in Bot Quint
Total Assets in Top Quint
Total Assets in Bot Quint
Single
Penalty Fees > $5/month
No Revolving CC Balance
Has Chase Credit Card
Debt / Income > Median
Chase Assets in Top Quint
Chase Assets in Bot Quint
CC utilization > 50%
Any Mortgage Payments
Annual Income < Median
Age < Median
0.0
0.1
0.2
0.3
0.4
0.5
Marginal Propensity to Consume

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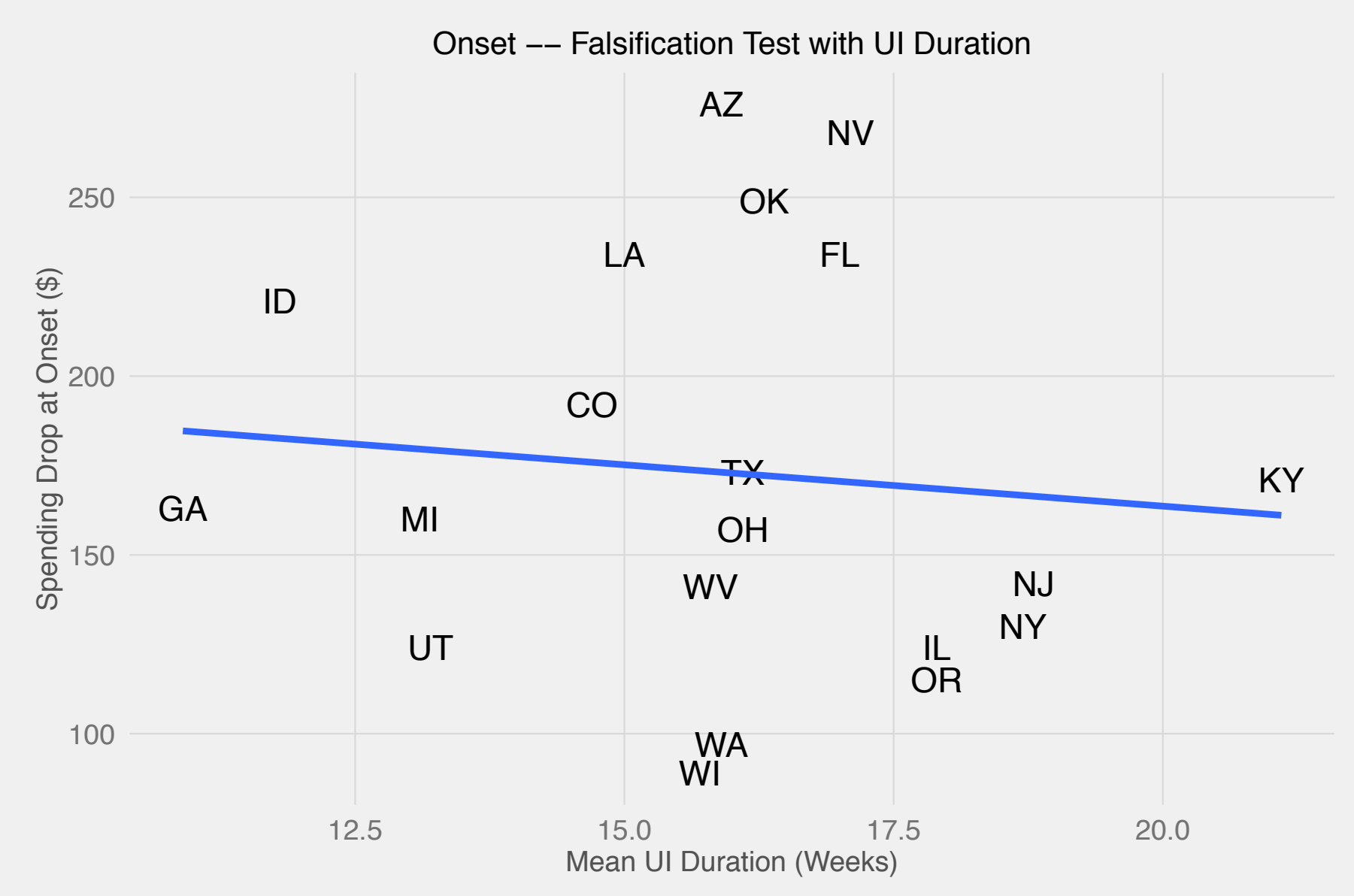
Empirics. Onset. Mean Duration and Spending Drop



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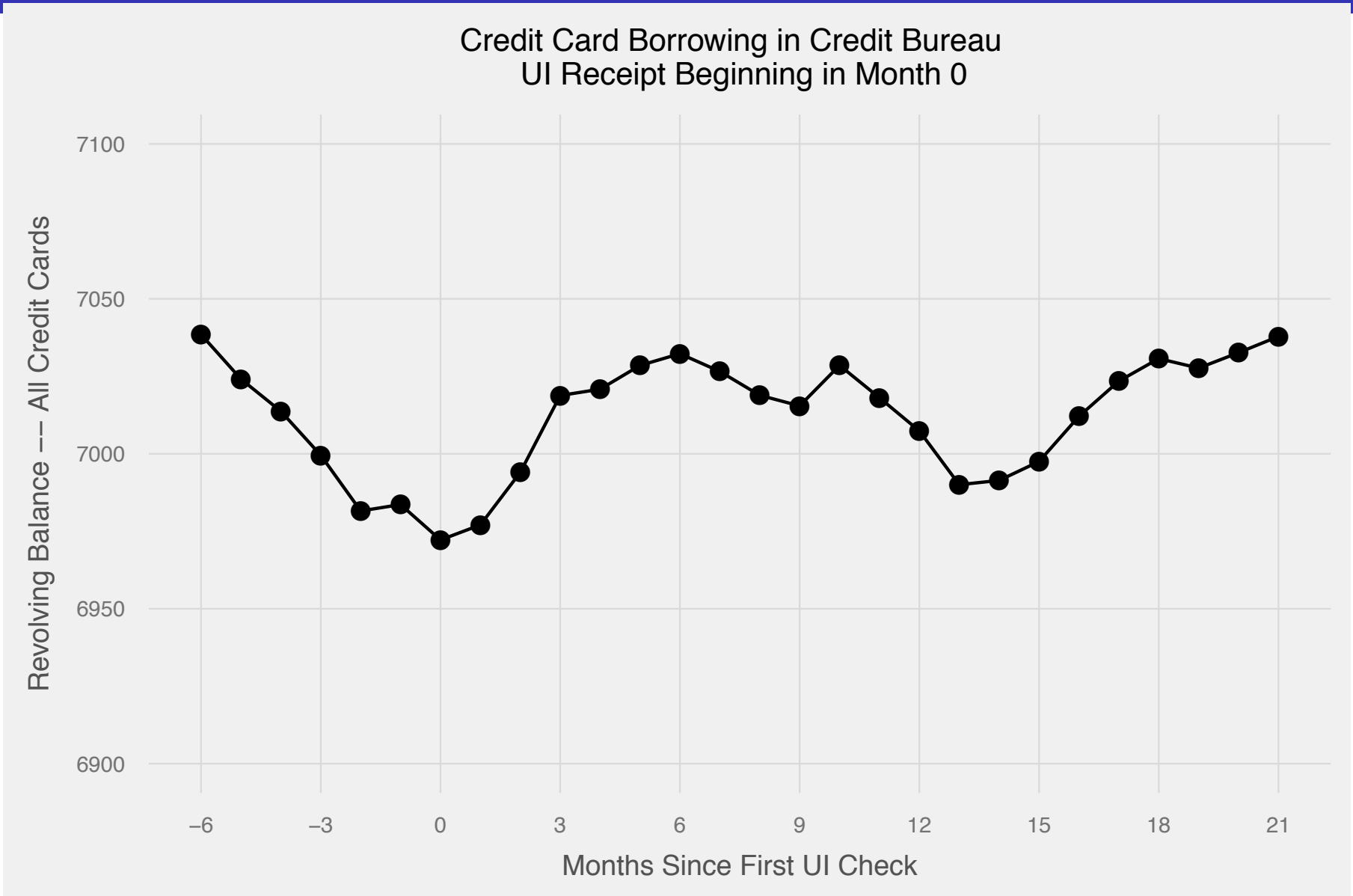
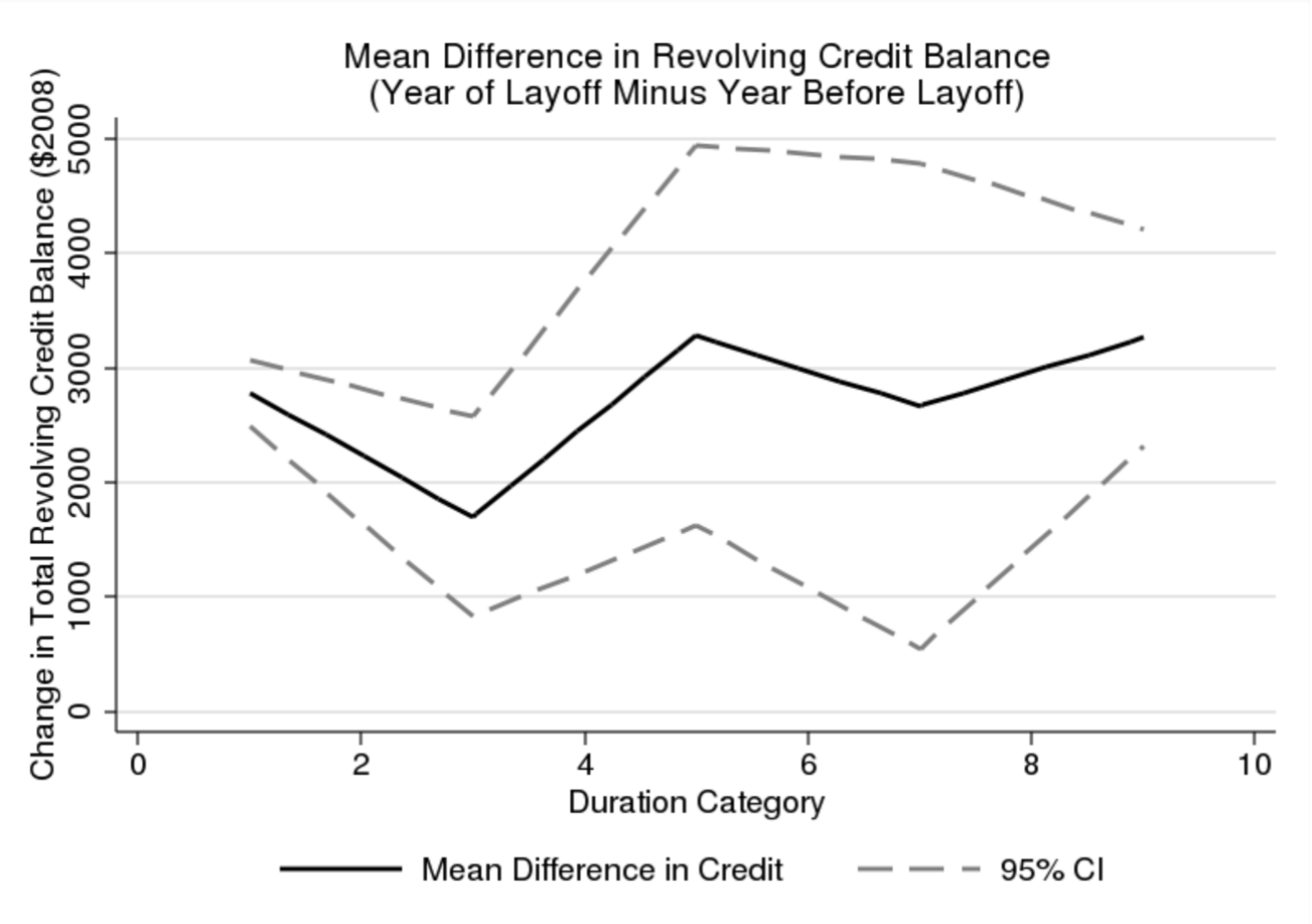
Borrowing on All Credit Cards



▸ Back to Onset ▸ Back to Model

Herkenhoff, Phillips and Cohen-Cole 2016

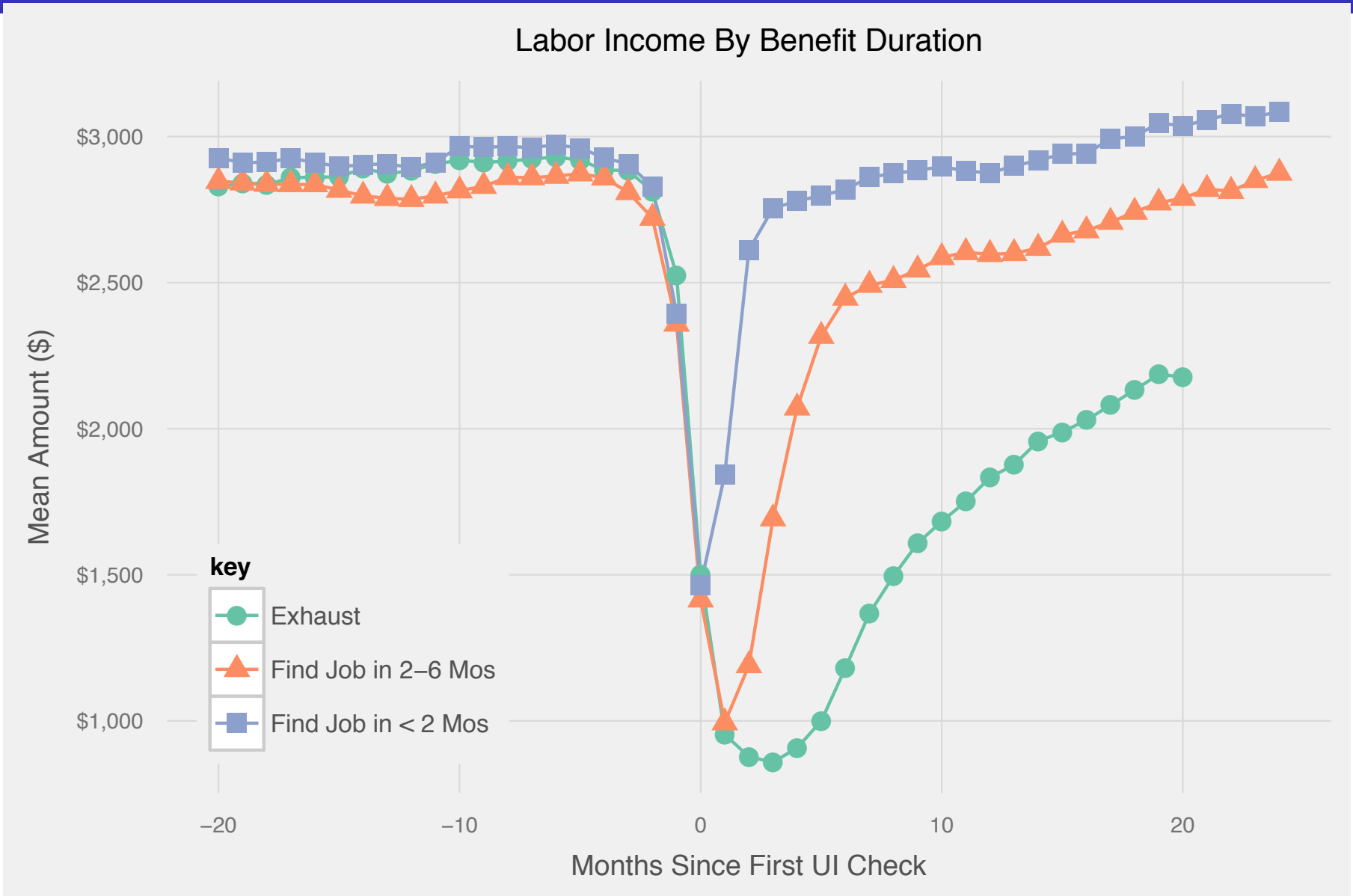


Baseline Chars: Pre-Onset Medians By UI Duration

Duration	Income	Spending	Ckg Assets
1	2788	2236	949
2	2894	2239	1011
3	2811	2181	1051
4	2737	2164	983
5	2685	2147	997
6	2612	2110	982
Exhaust	2564	2112	1045

▸ Back

Onset: Heterogeneity By Duration



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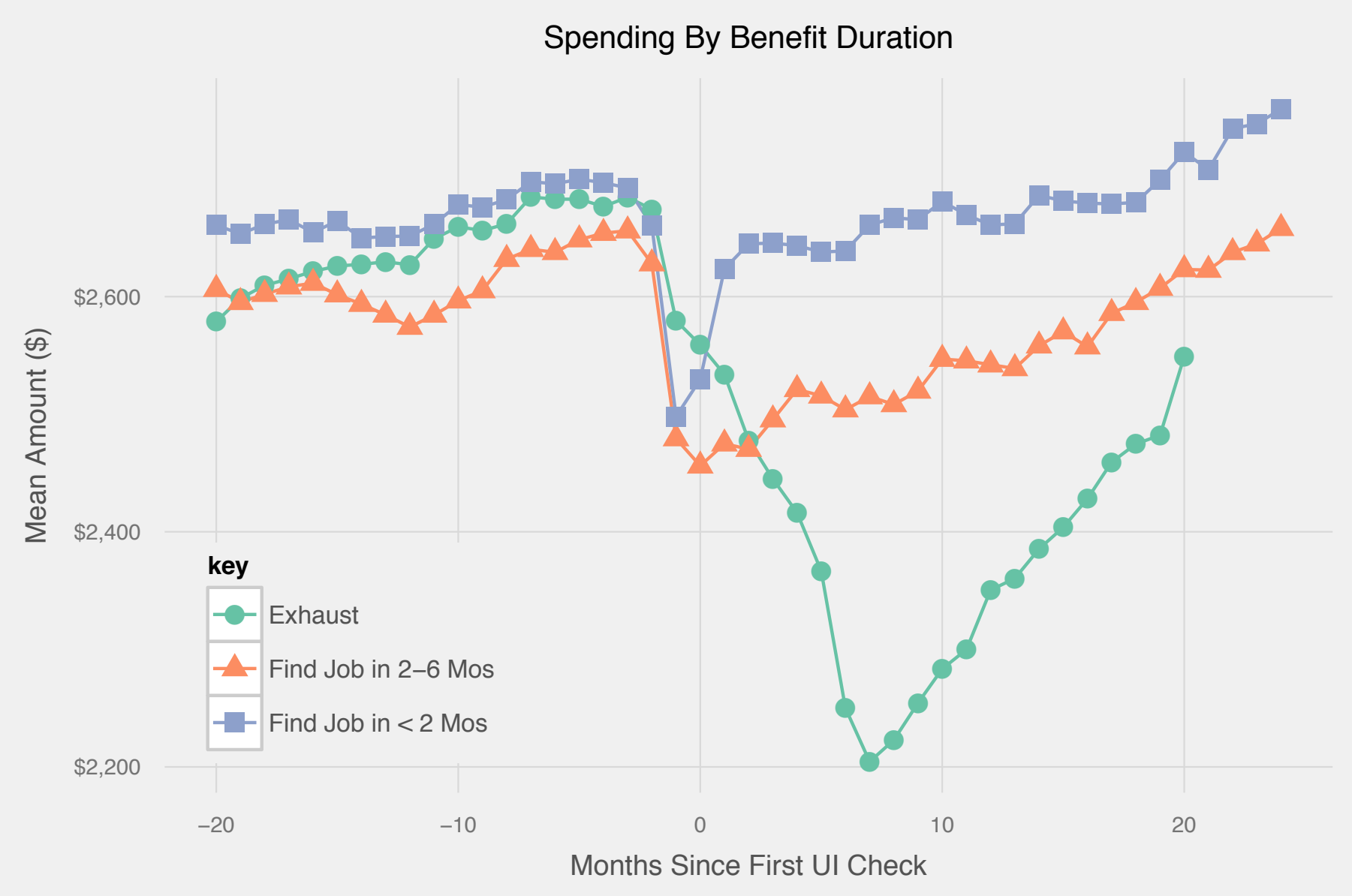
Onset: Heterogeneity By Duration



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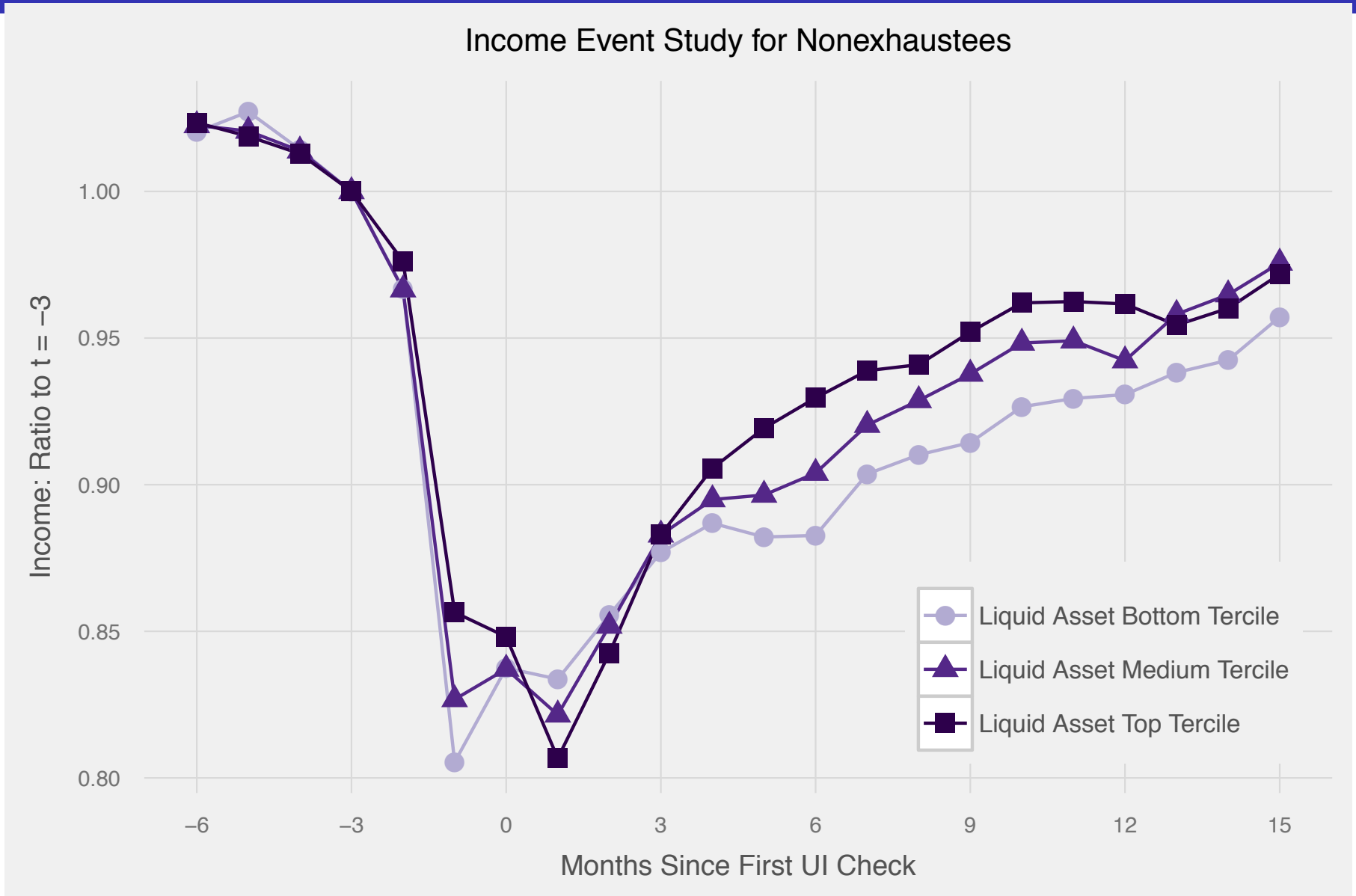
Onset: Heterogeneity By Total Liquid Assets



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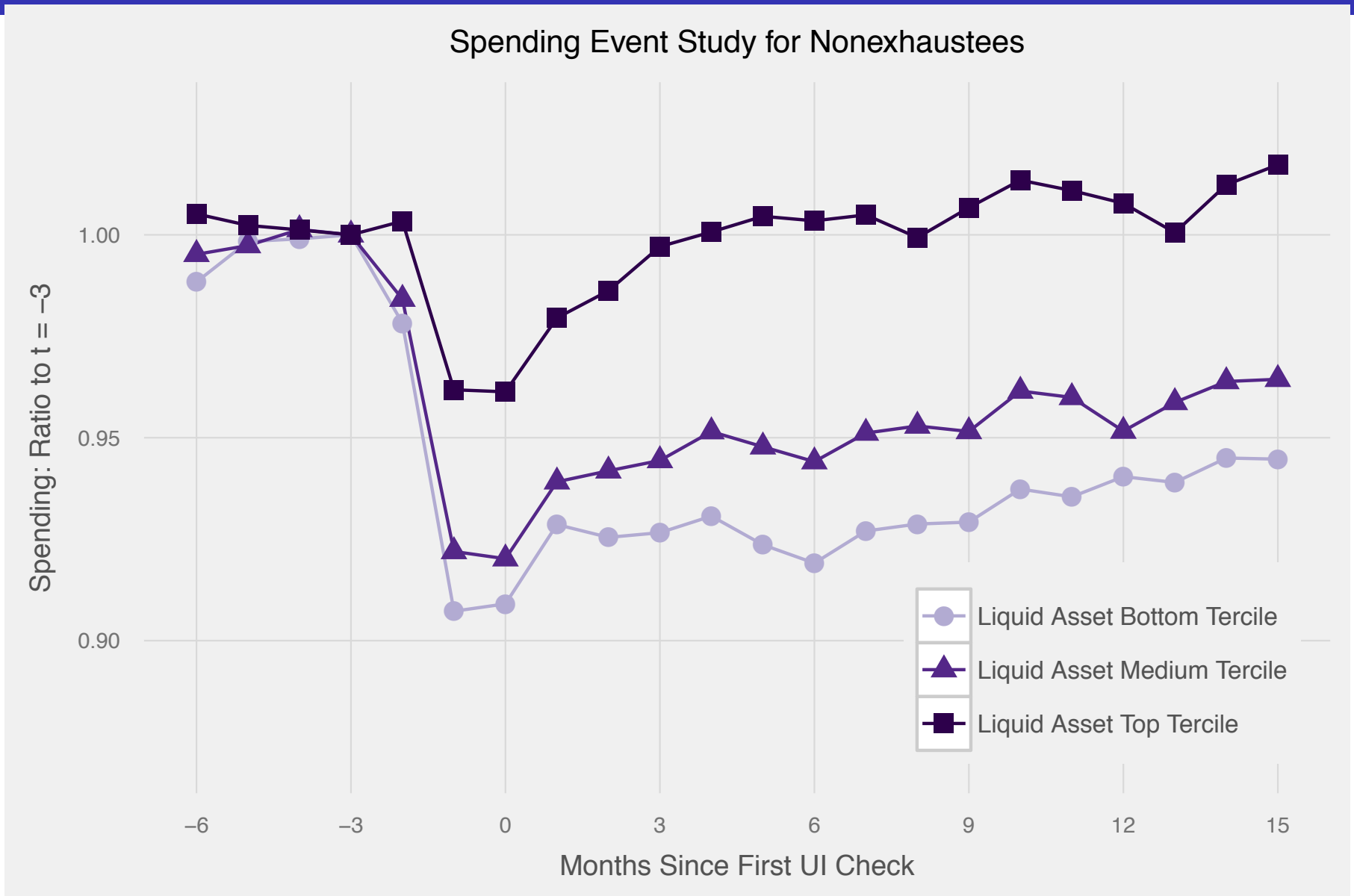
Onset: Heterogeneity By Total Liquid Assets



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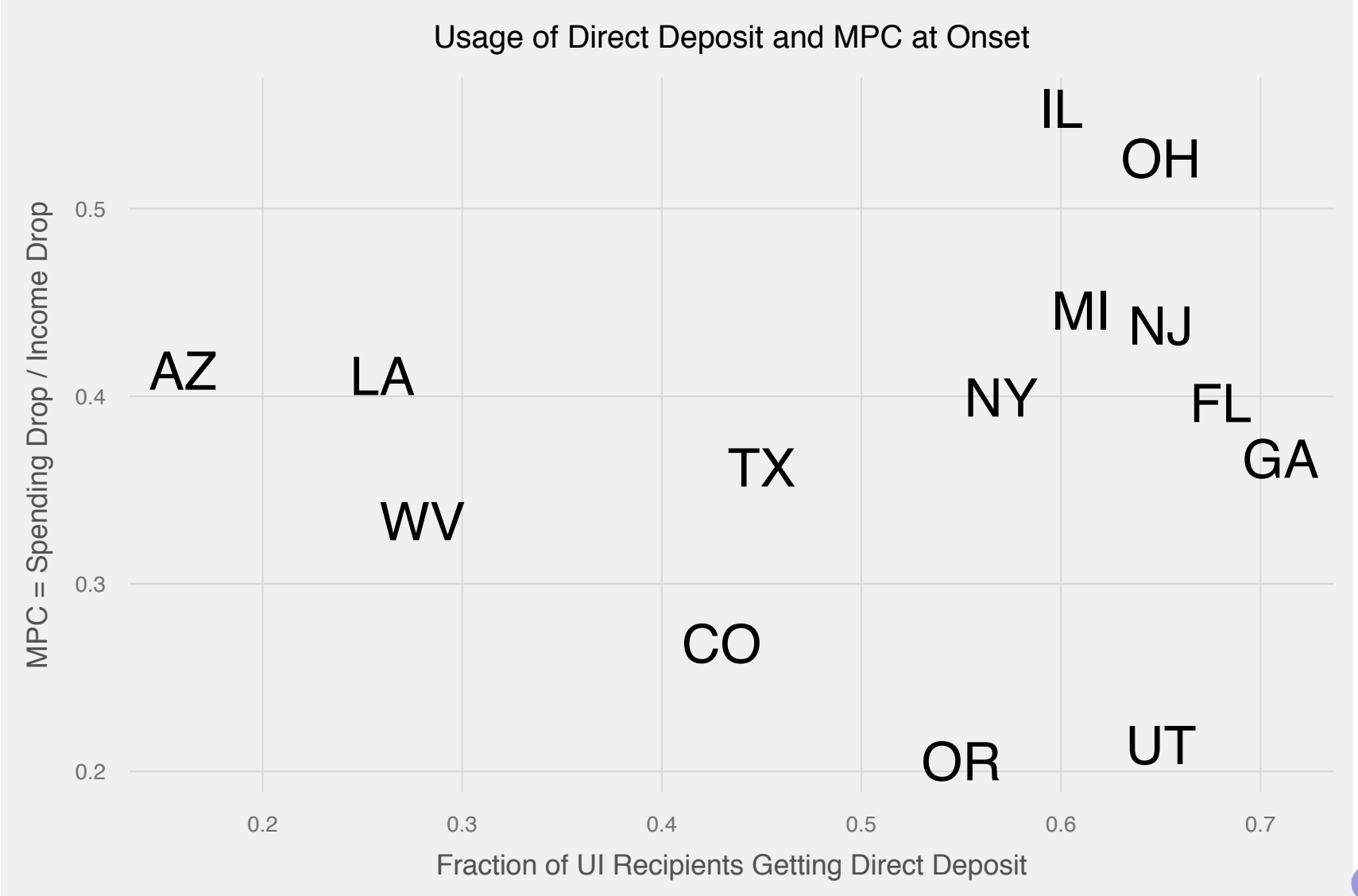
Onset MPC By State



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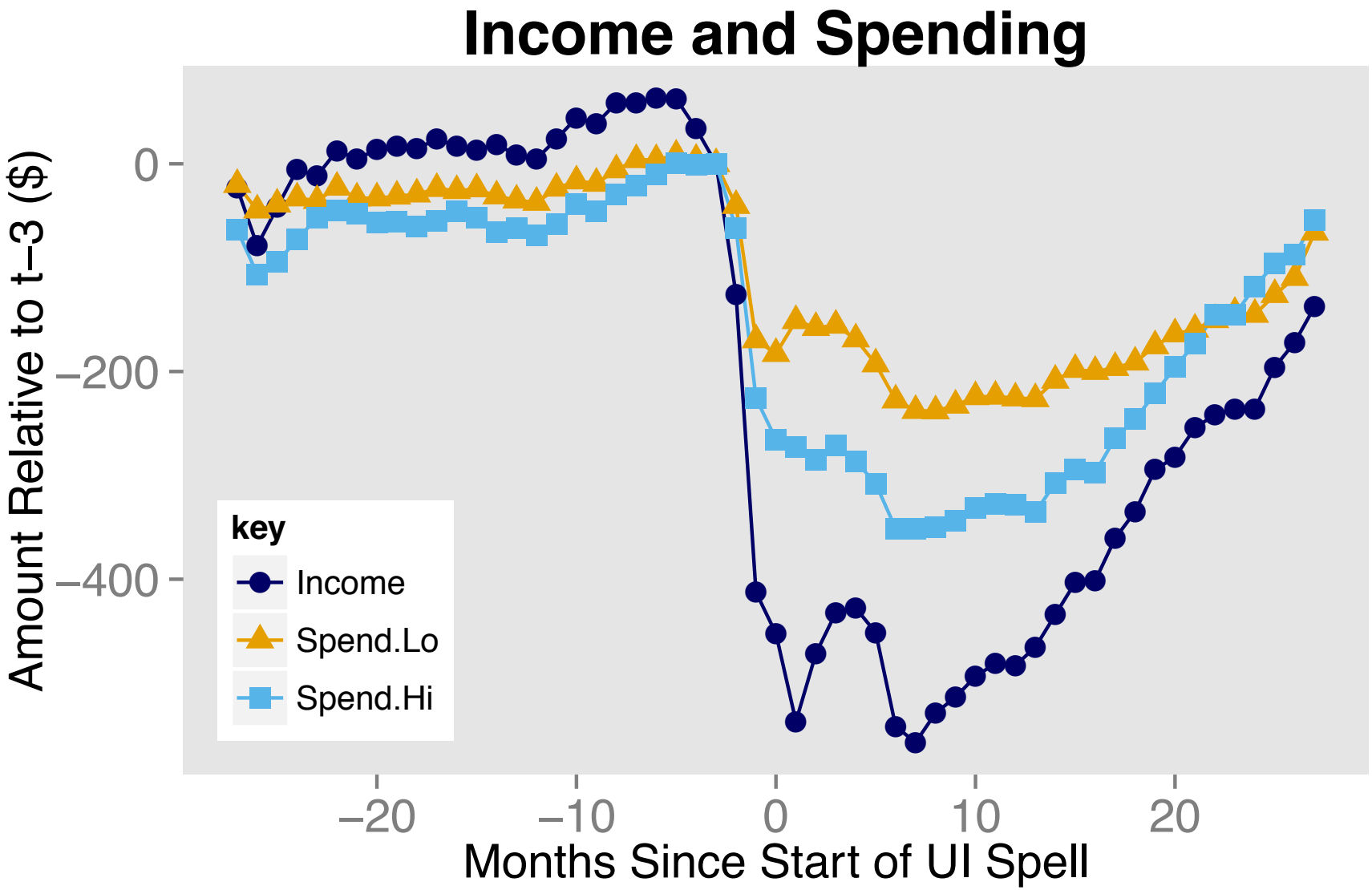
Spending: Long-Run Trends



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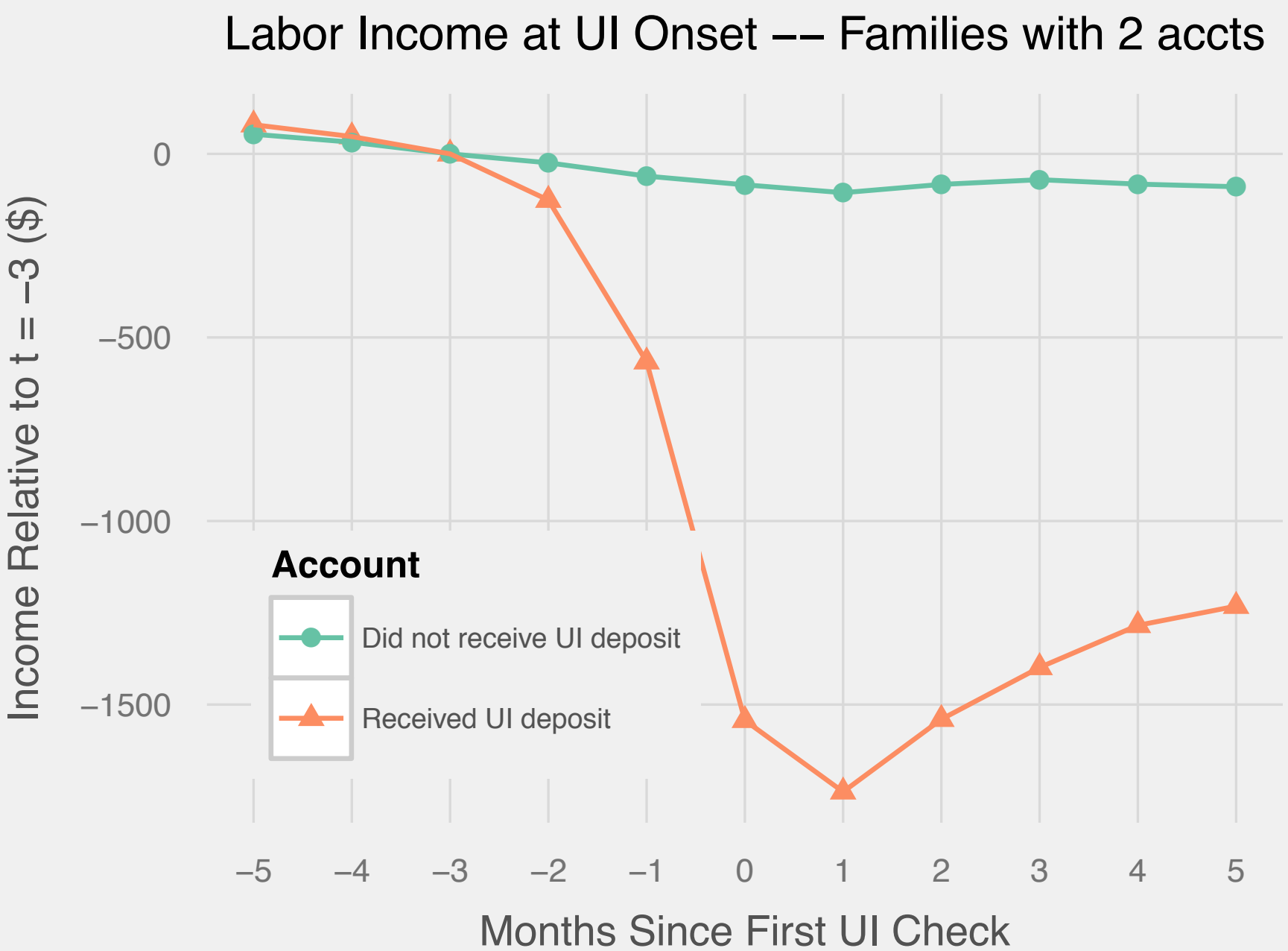
Linked and Unlinked Accounts

- Most families with multiple checking accounts have linked their accounts together under a single primary customer

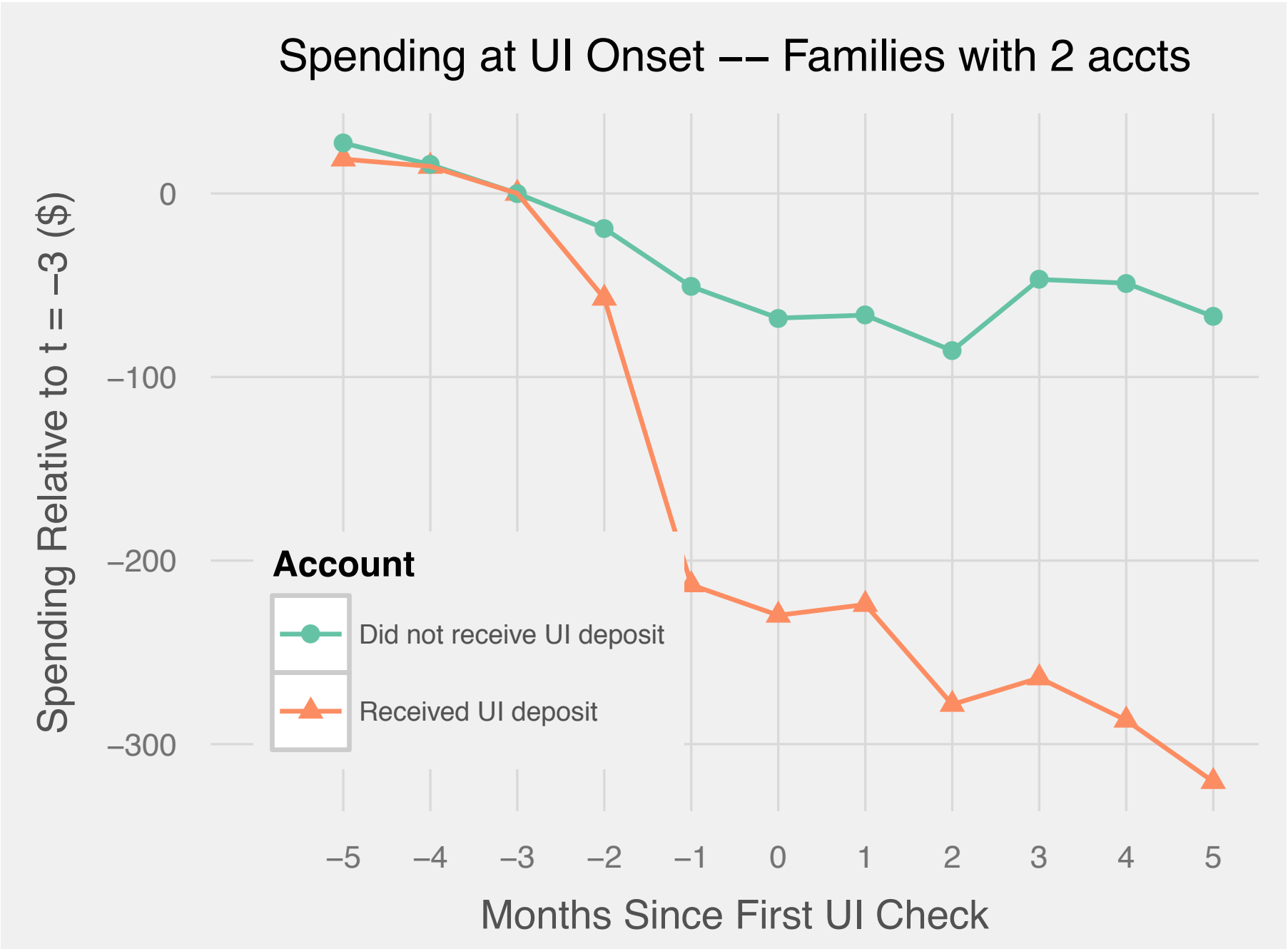
- About 10% of UI recipients have multiple accounts
  - Not linked
  - Matched by same last name and address
  - Could arise if two Chase customers got married, decided to keep separate accounts

- Plots
  - Onset: Income and Spending
  - Exhaustion: Income and Spending Back to Onset Back to Exhaustion

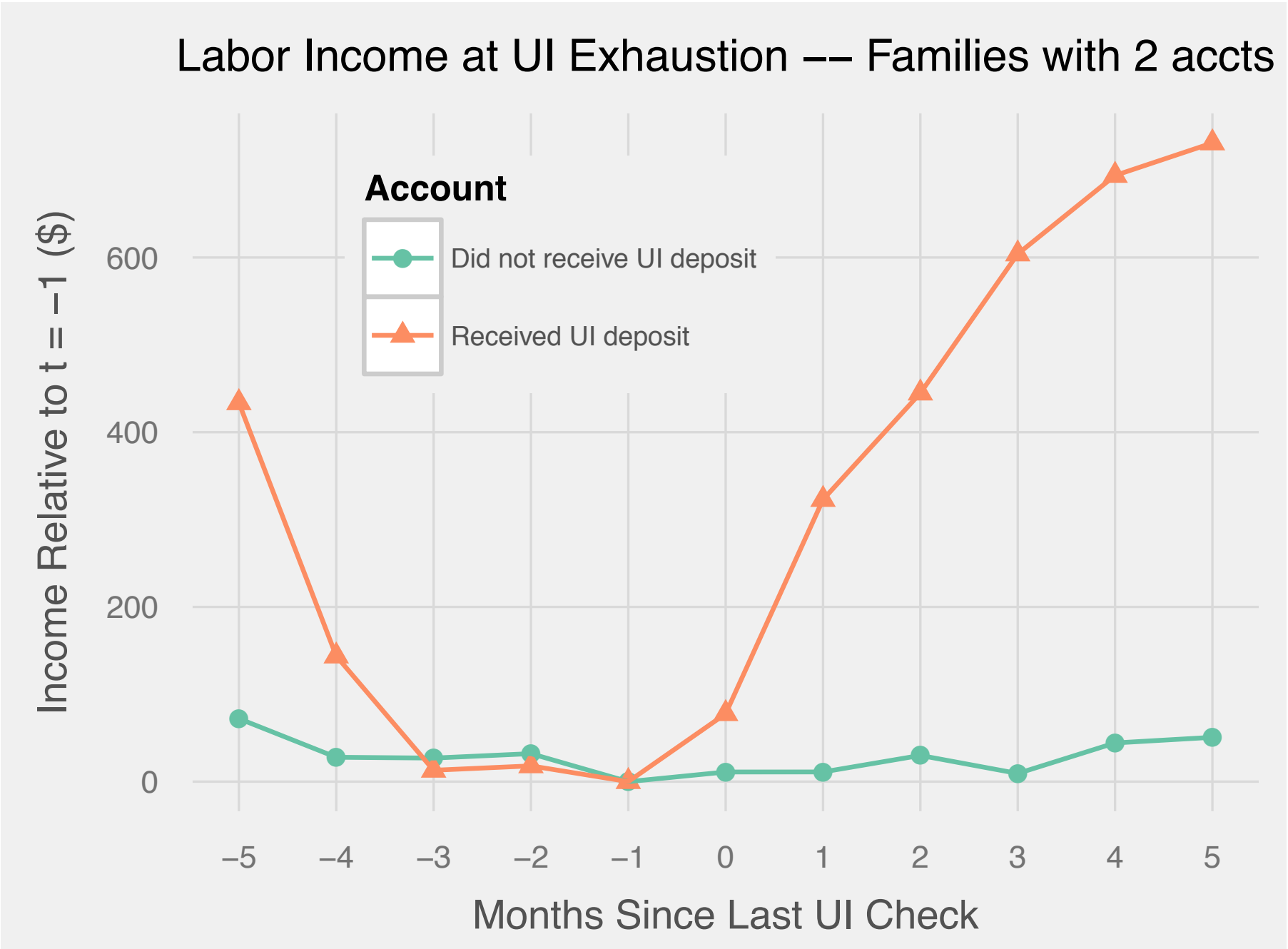
Linked and Unlinked Accounts – Income at Onset



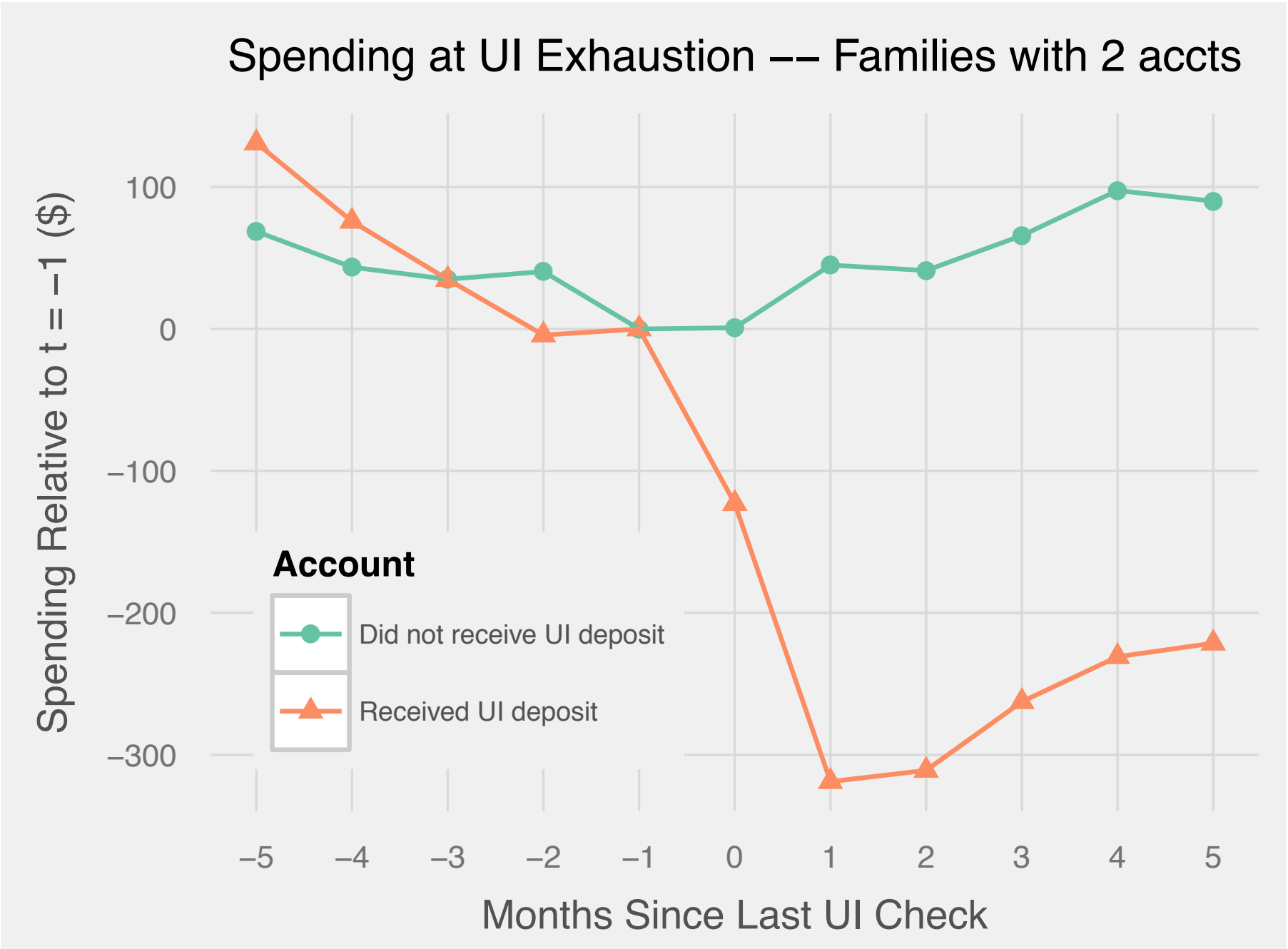
Linked and Unlinked Accounts – Spending at Onset



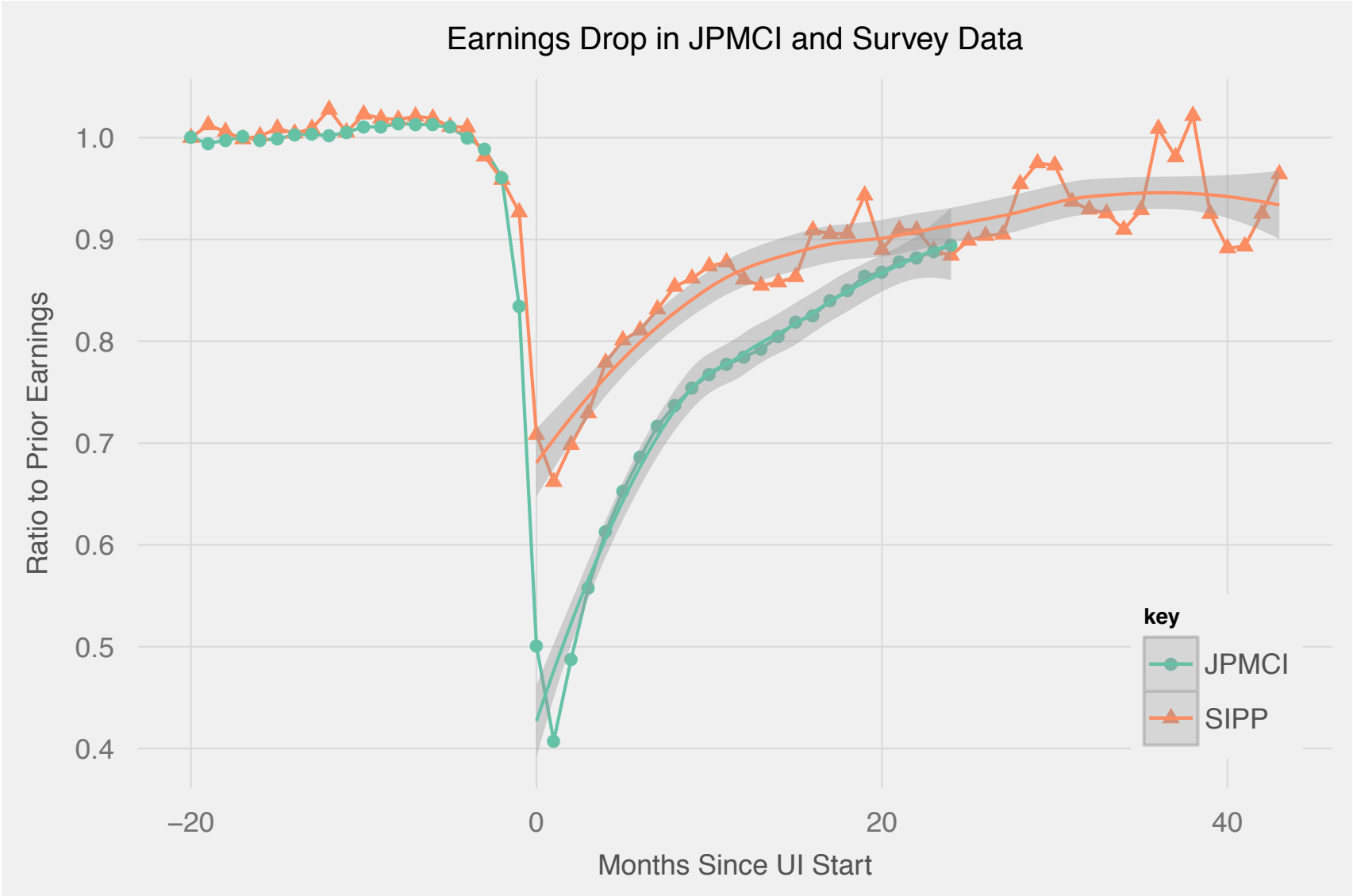
Linked and Unlinked Accounts – Income at Exhaustion



Linked and Unlinked Accounts – Spending at Exhaustion



Income Recovery: Comparison to SIPP



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Income Recovery: JLS Mass Layoff

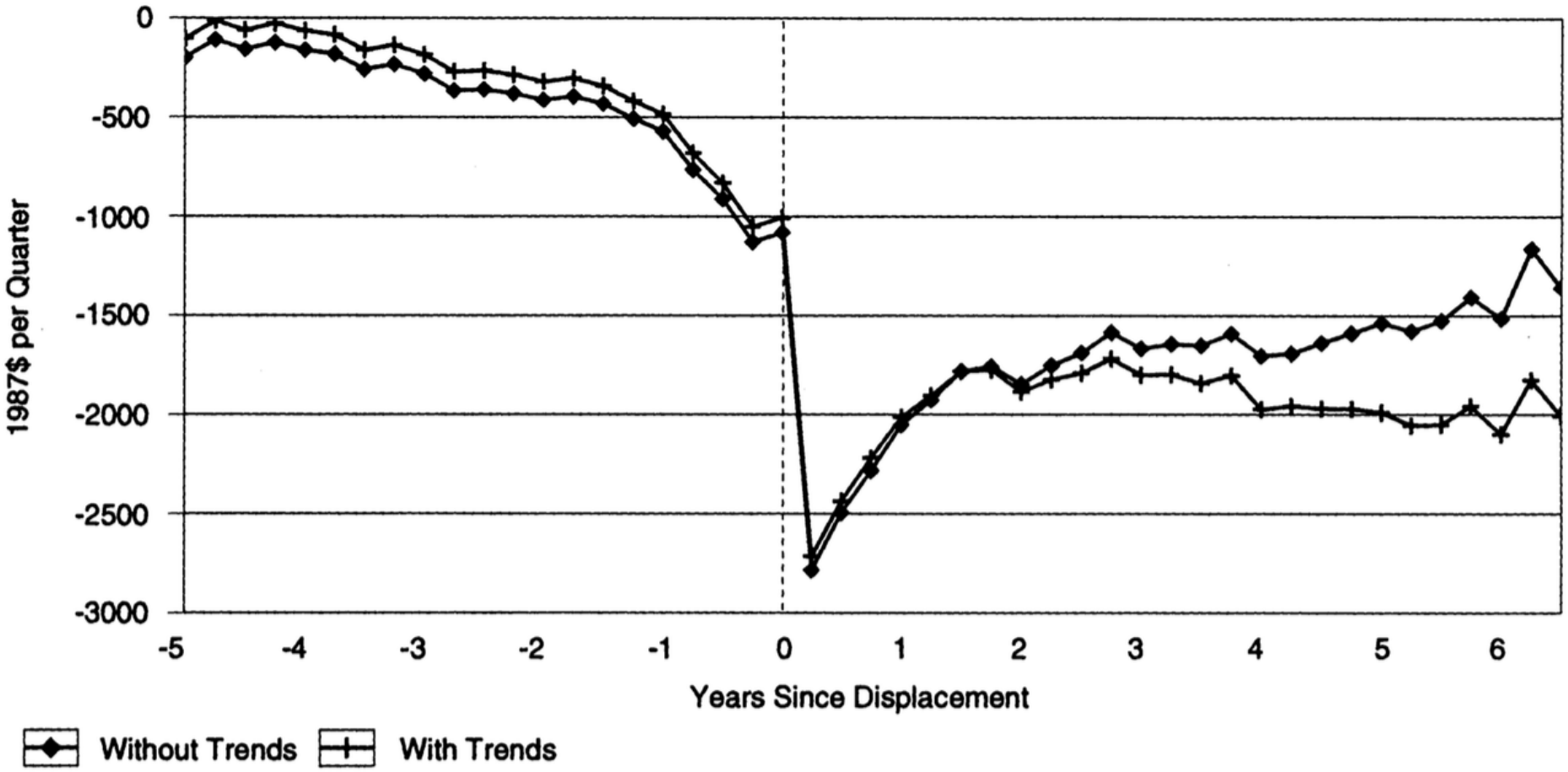

FIGURE 2. EARNINGS LOSSES FOR SEPARATORS IN MASS-LAYOFF SAMPLE

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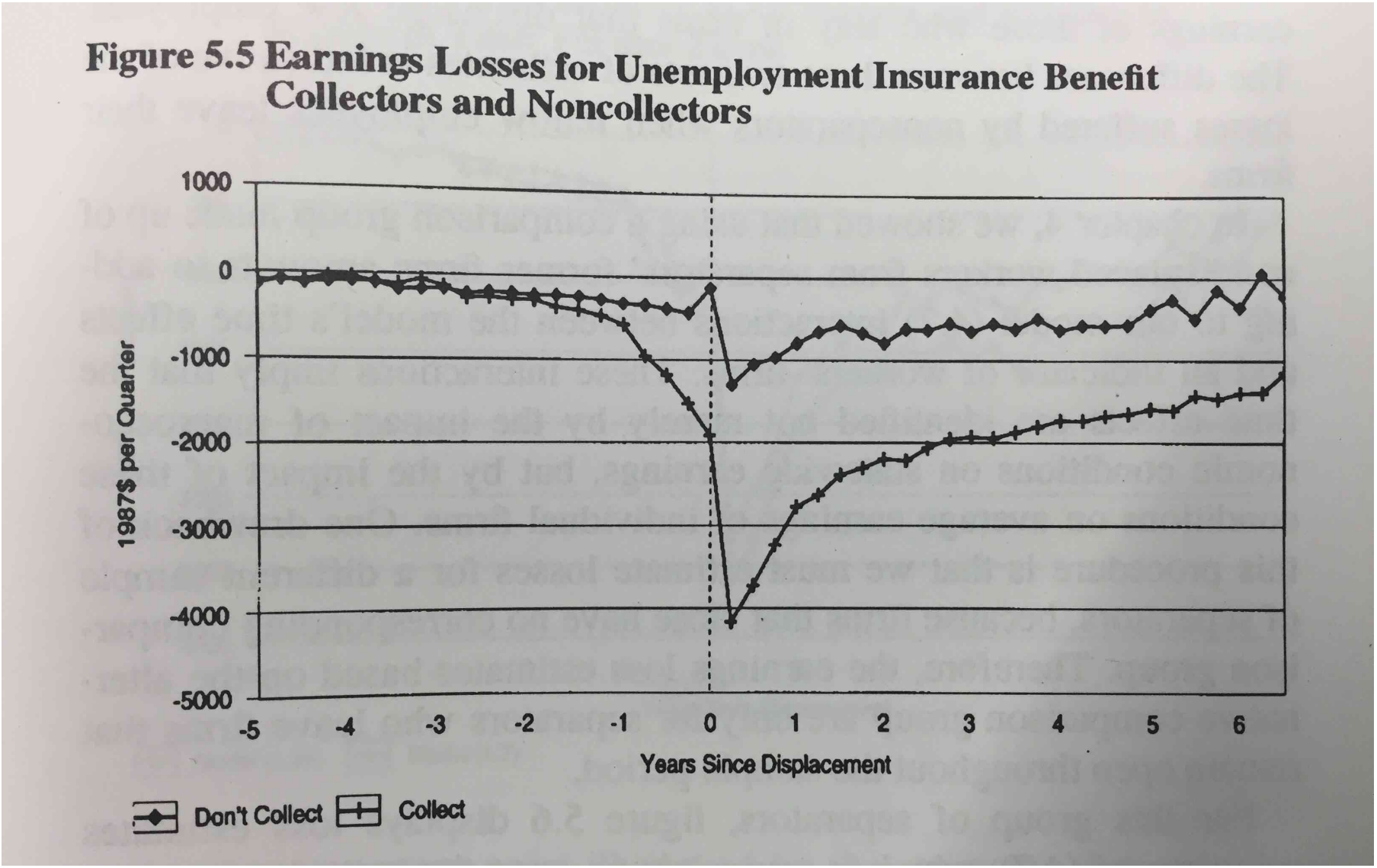
Income Recovery: JLS All UI Recips



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Empirics. Work-Related Expenses Details

- Methodology for estimating impact of change in employment status on spending in work-related categories

$$E(c_{work}(y, e=1)) - E(c_{work}(y, e=0)) =$$

$$\underbrace{E(c_{work}(y_{emp}, e=1)) - E(c_{work}(y_{unemp}, e=0))}_{\text{Total drop in work categories}} -$$

$$\underbrace{E(c_{work}(y_{\text{UI Benefit}}, e=0)) - E(c_{work}(y_{\text{UI Exhaust}}, e=0))}_{\text{Drop in work categories due to lost income}}$$

- Estimate final term using two methods:
  - Drop in spending on work-related categories at benefit exhaustion

$$MPC^{work}_{exhaust}(y_{\text{Emp}} - y_{\text{UI Benefit}})$$

  - Drop in spending on non-work-related categories at onset

$$MPC^{nonwork}_{onset}(y_{\text{Emp}} - y_{\text{UI Benefit}})$$

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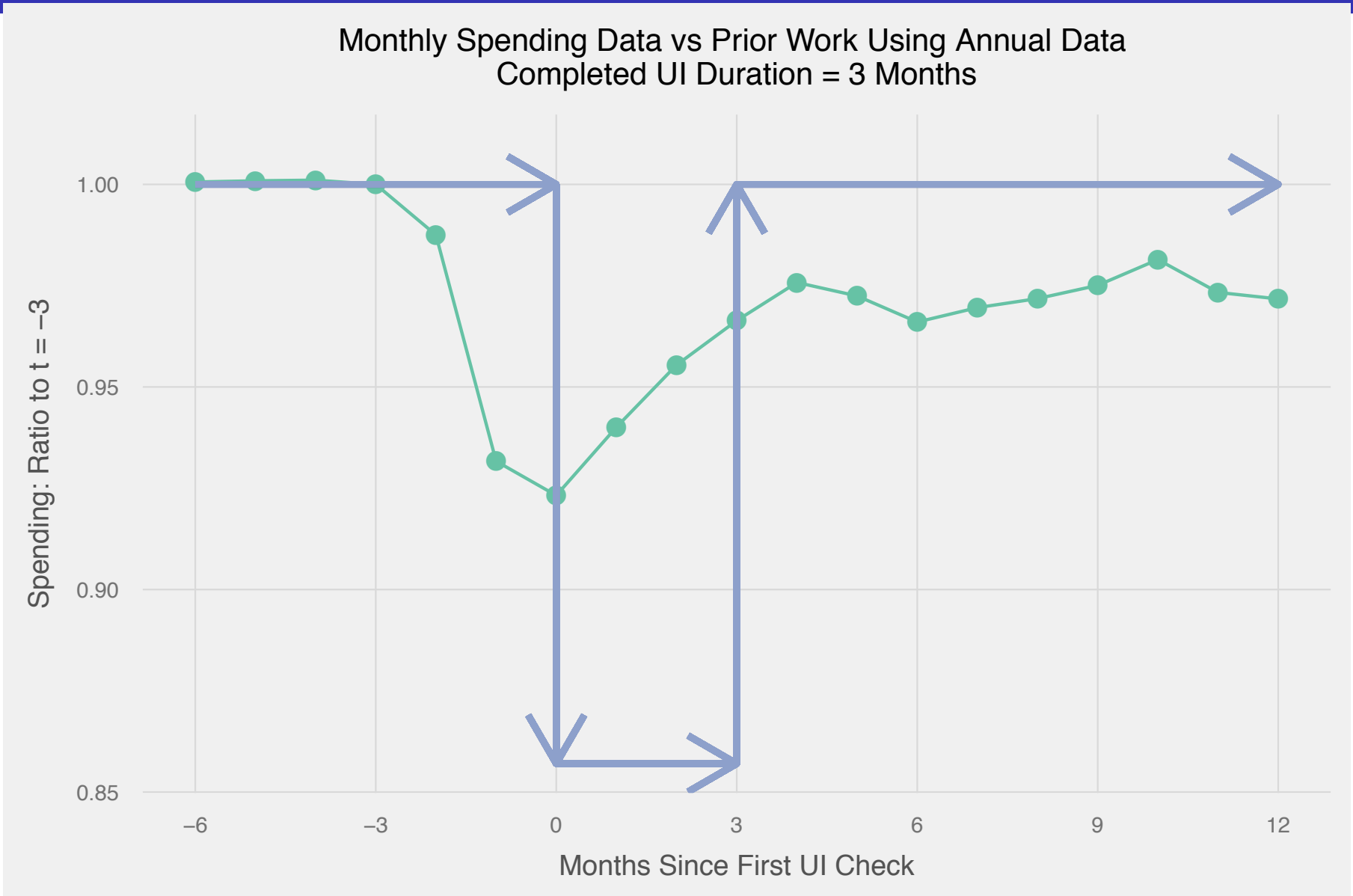
Annual Spending Data Miss Monthly Smoothing



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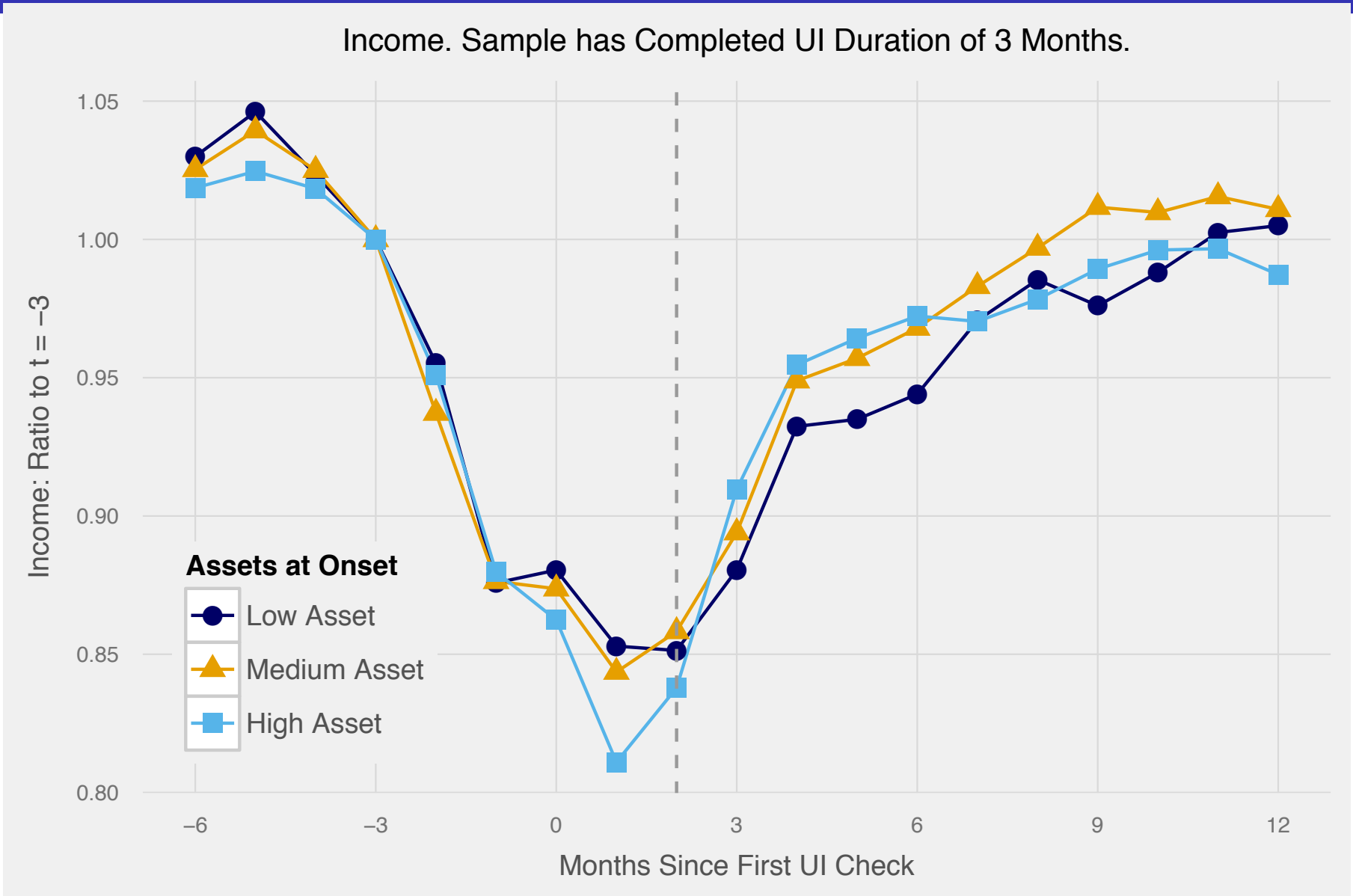
Path of Income Similar By Asset Holdings



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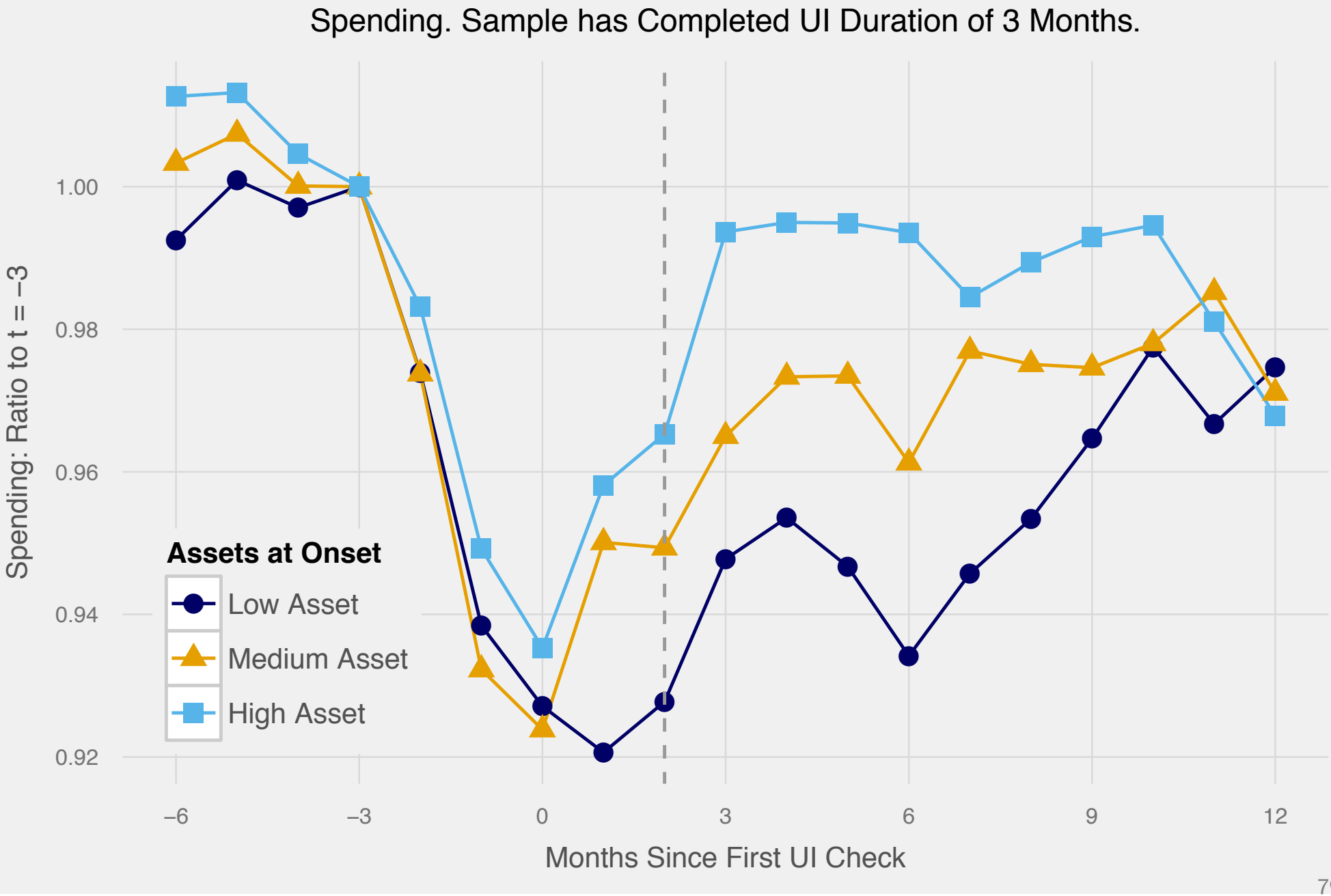
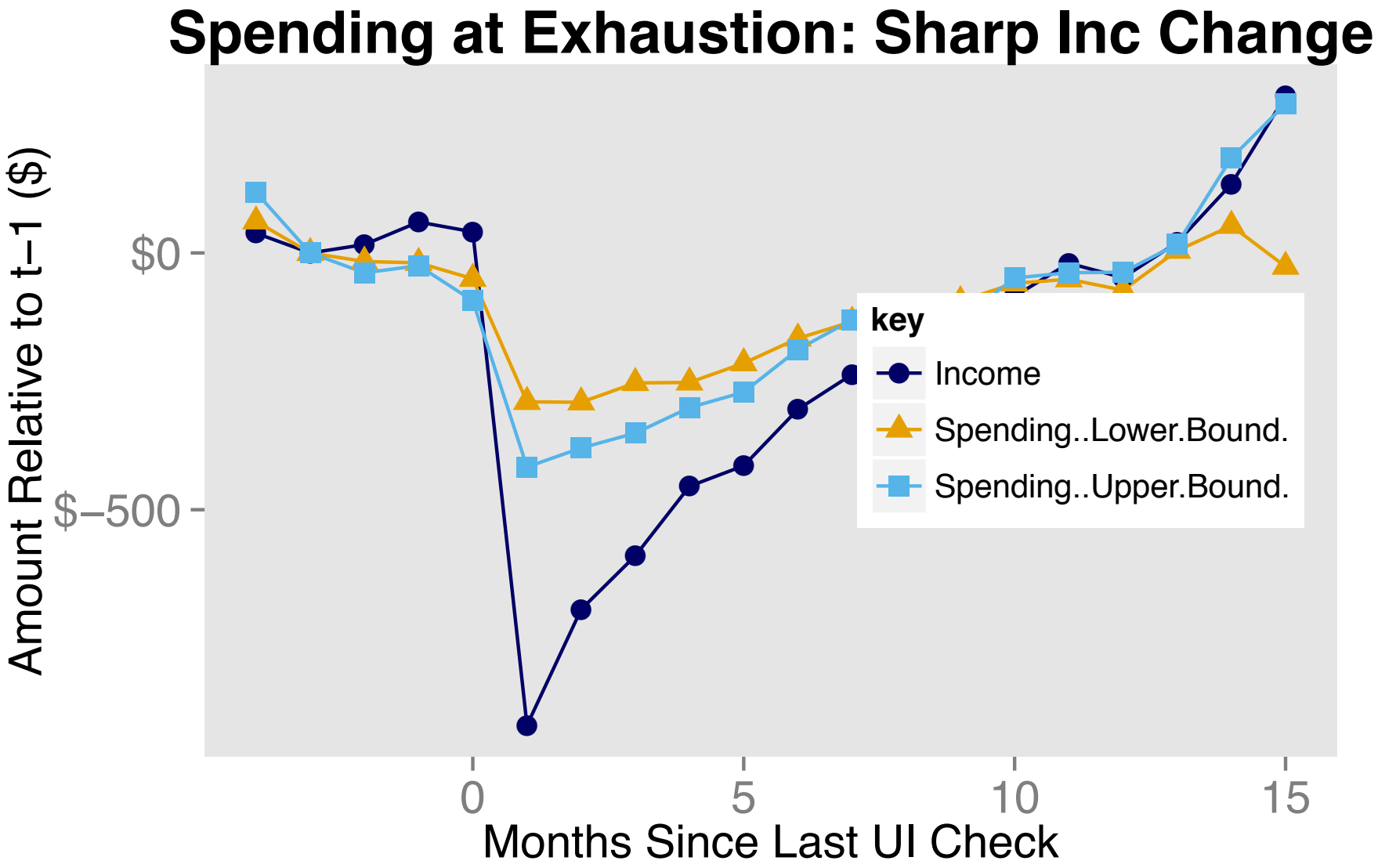
Spending Recovers Slowly For Low Asset Types



Exhaustion: Robustness Checks for Internal Validity



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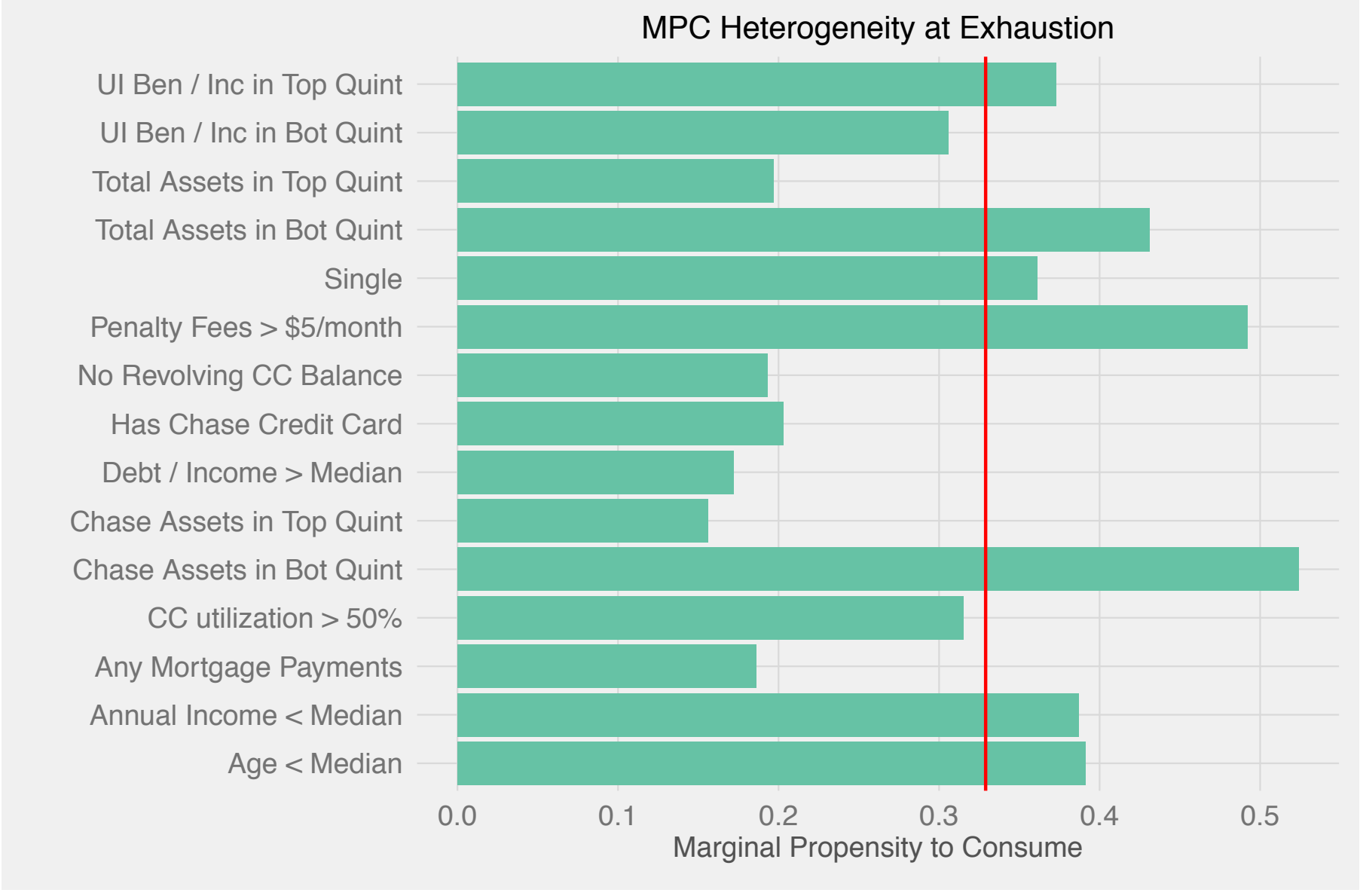
MPC Heterogeneity at Exhaustion
UI Ben / Inc in Top Quint
UI Ben / Inc in Bot Quint
Total Assets in Top Quint
Total Assets in Bot Quint
Single
Penalty Fees > $5/month
No Revolving CC Balance
Has Chase Credit Card
Debt / Income > Median
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Chase Assets in Bot Quint
CC utilization > 50%
Any Mortgage Payments
Annual Income < Median
Age < Median
0.0
0.1
0.2
0.3
0.4
0.5
Marginal Propensity to Consume

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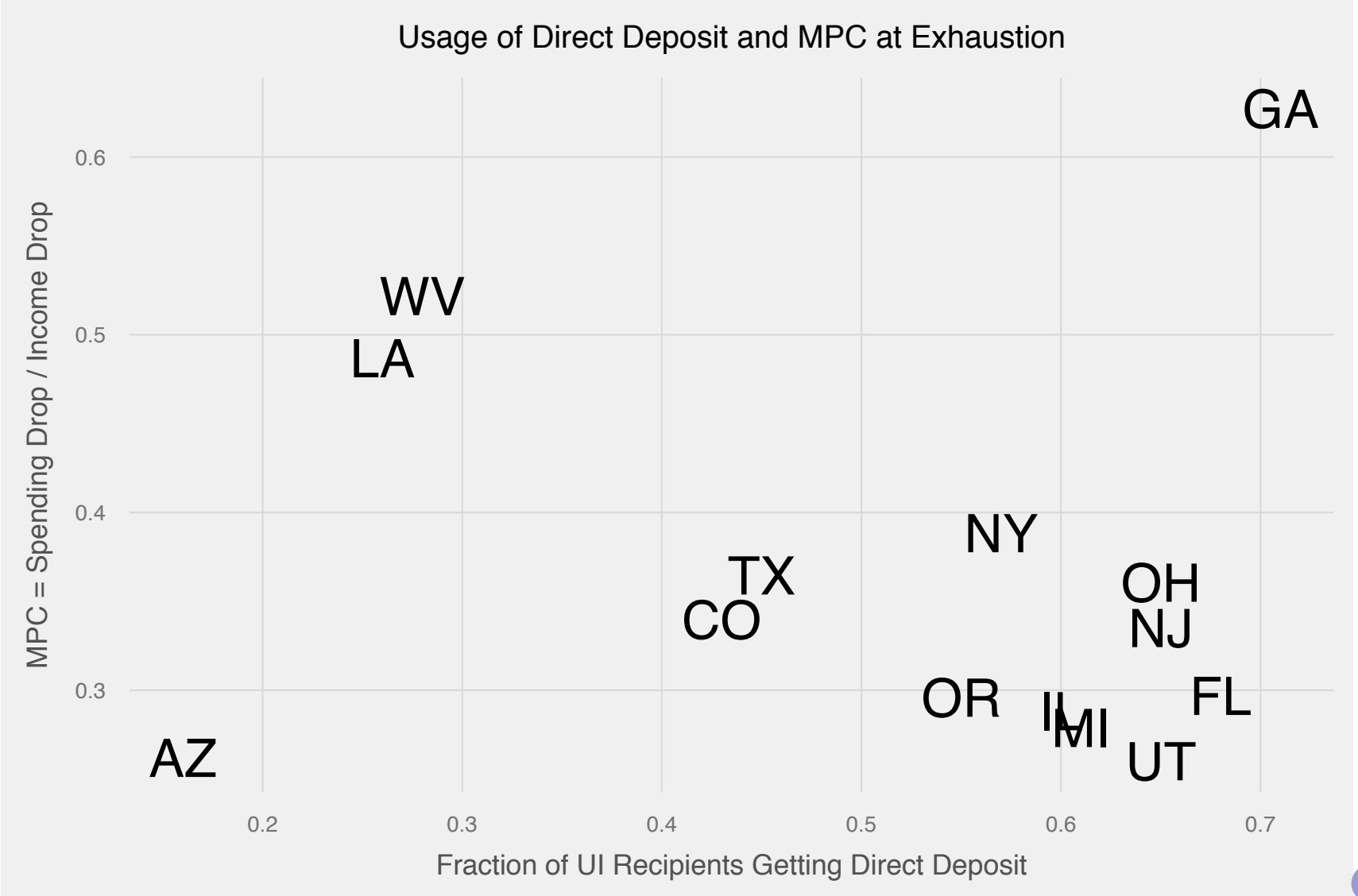
Exhaustion MPC By State



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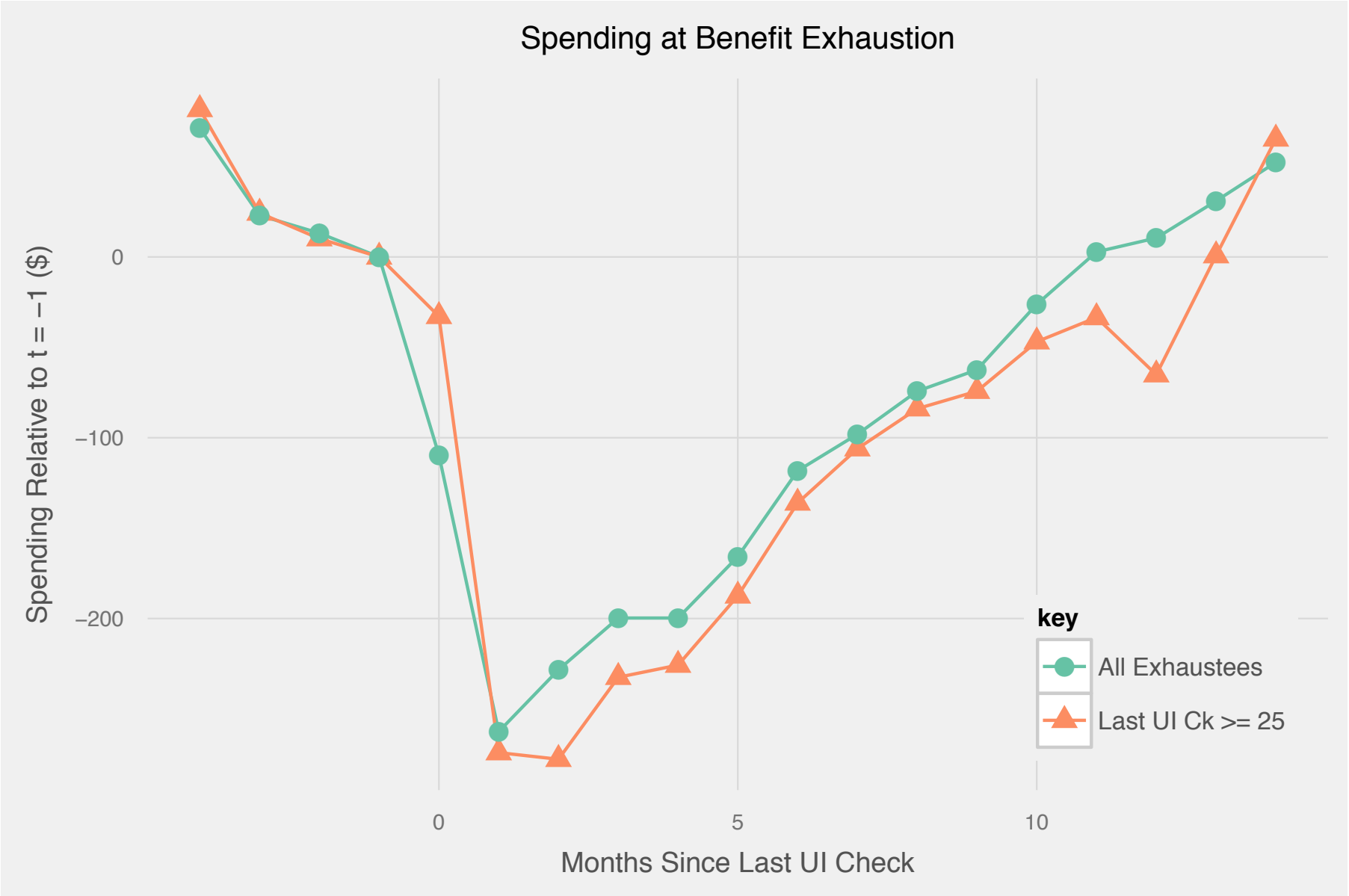
Exhaustion: Time Aggregation for Spending



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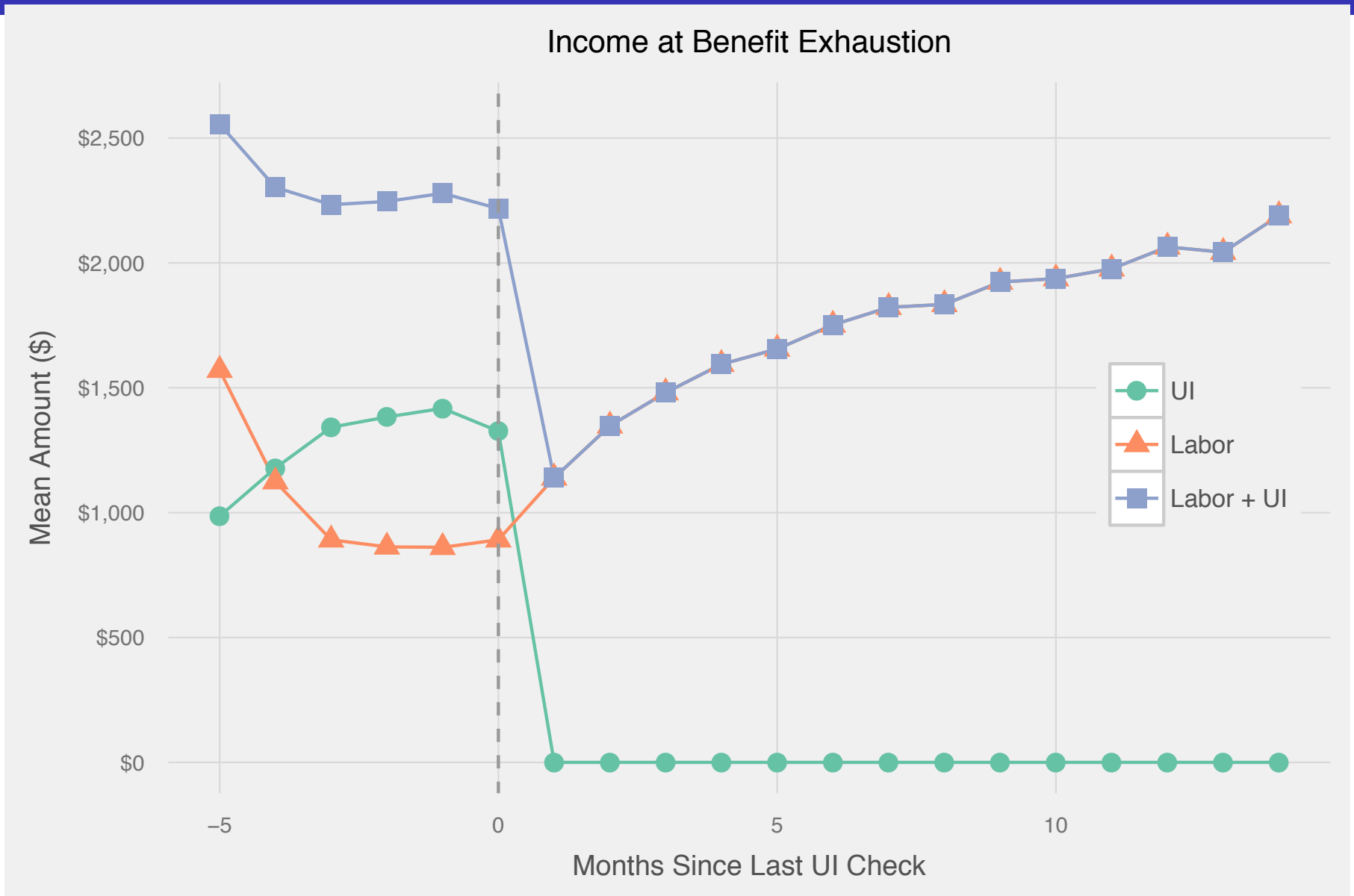
Income Drops by $1200 At Exhaustion



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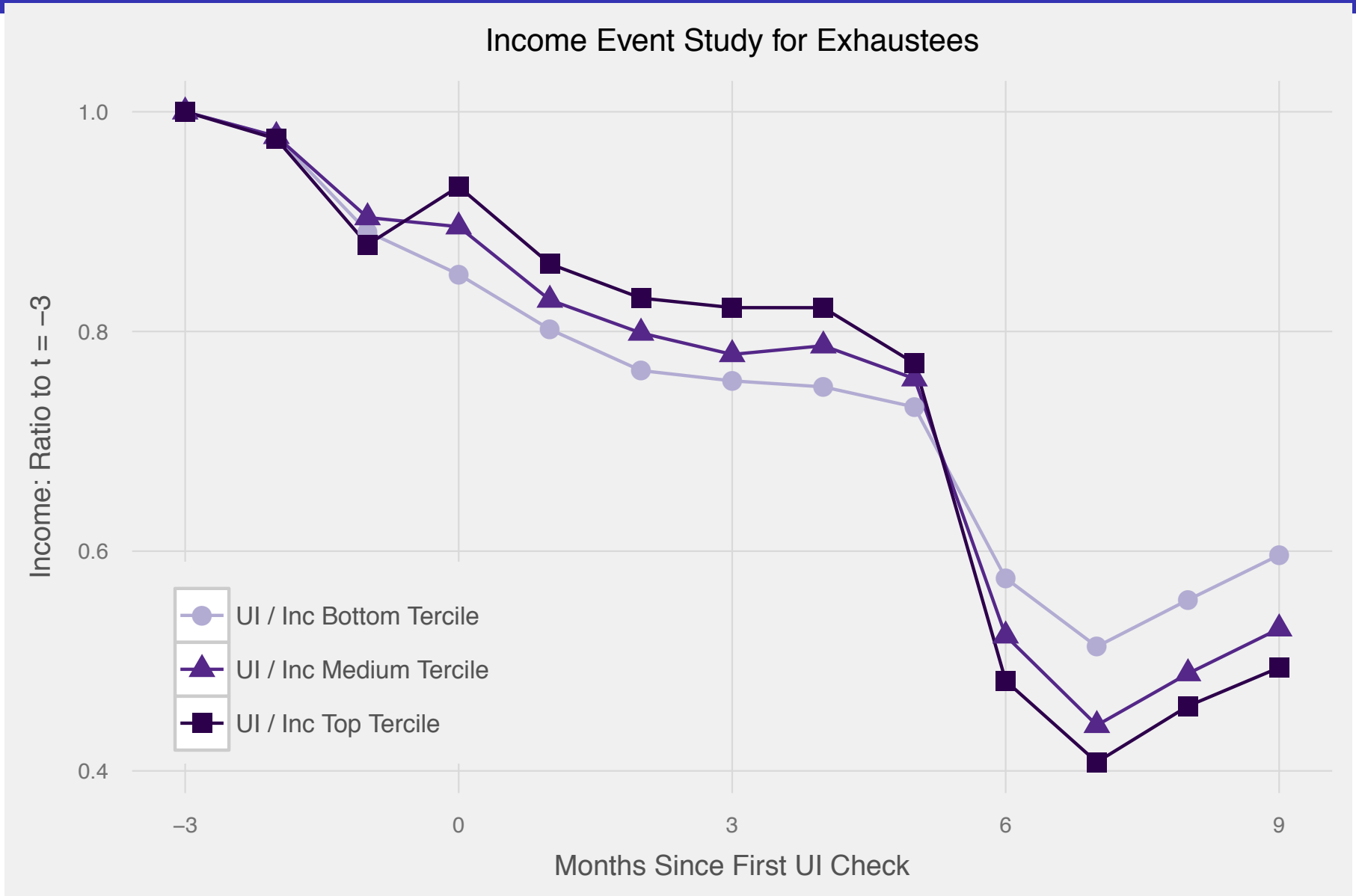
Exhaustion: Heterogeneity by Income Drop



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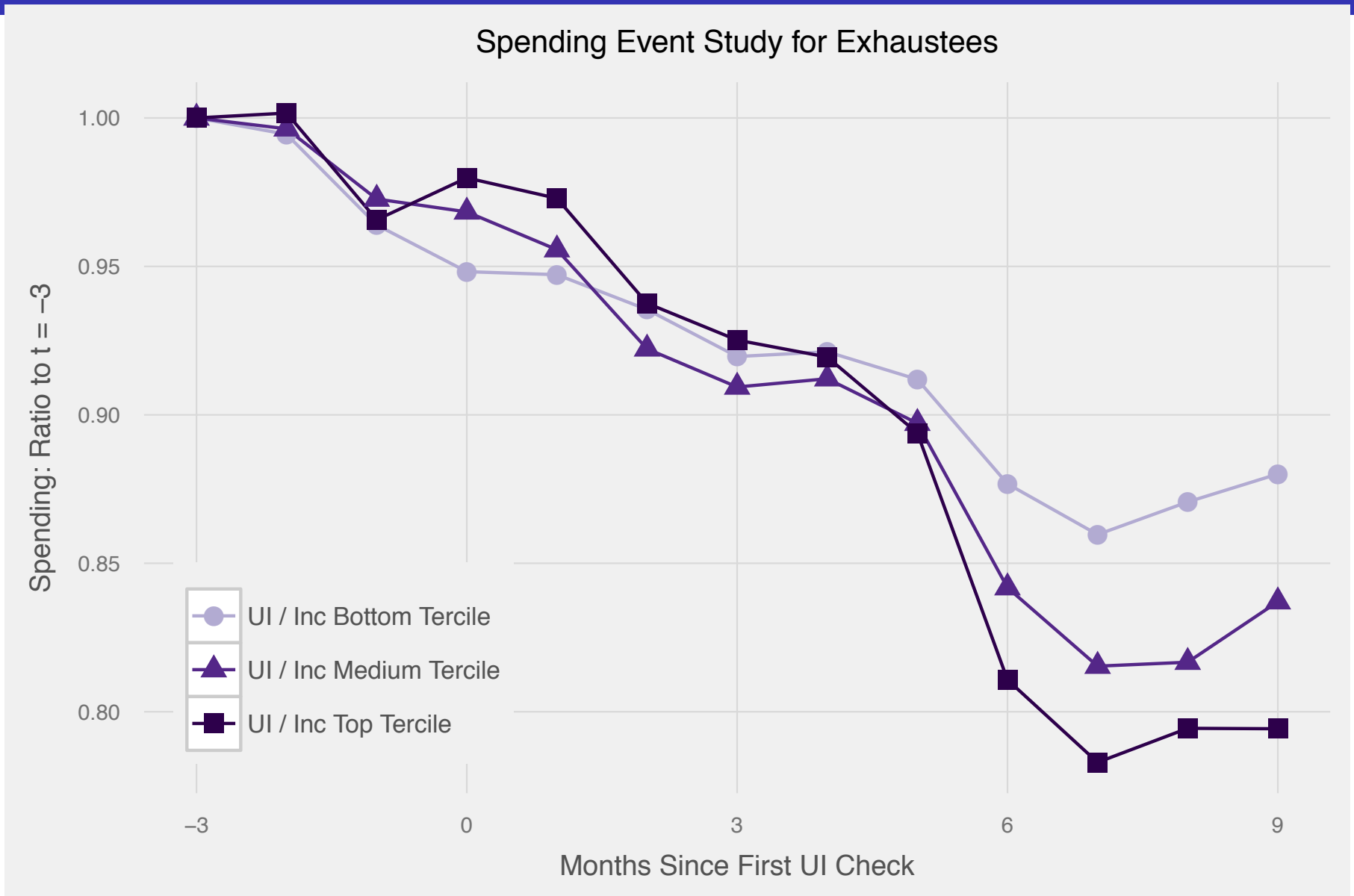
Exhaustion: Heterogeneity by Income Drop



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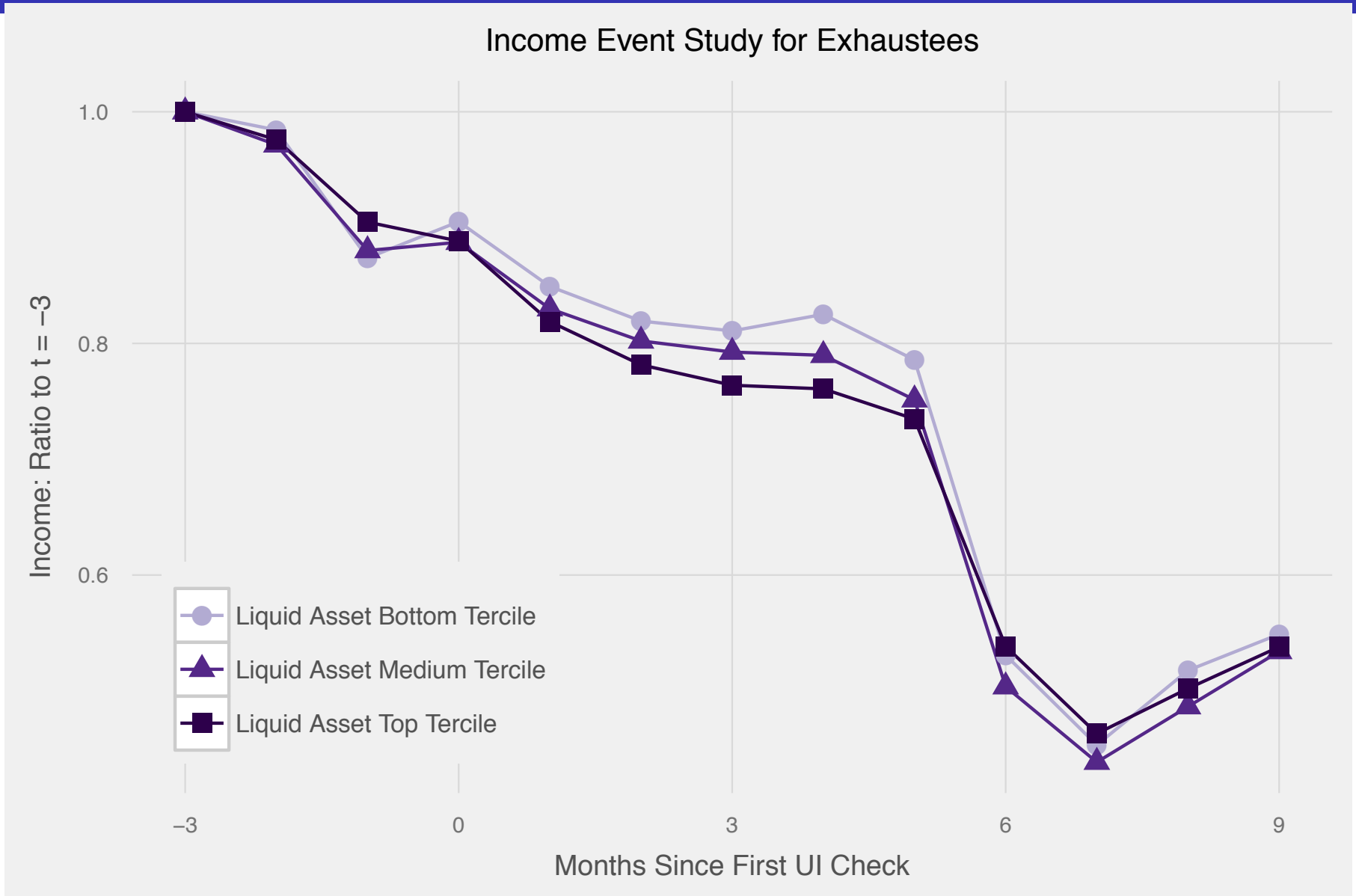
Exhaustion: Heterogeneity by Liquid Assets



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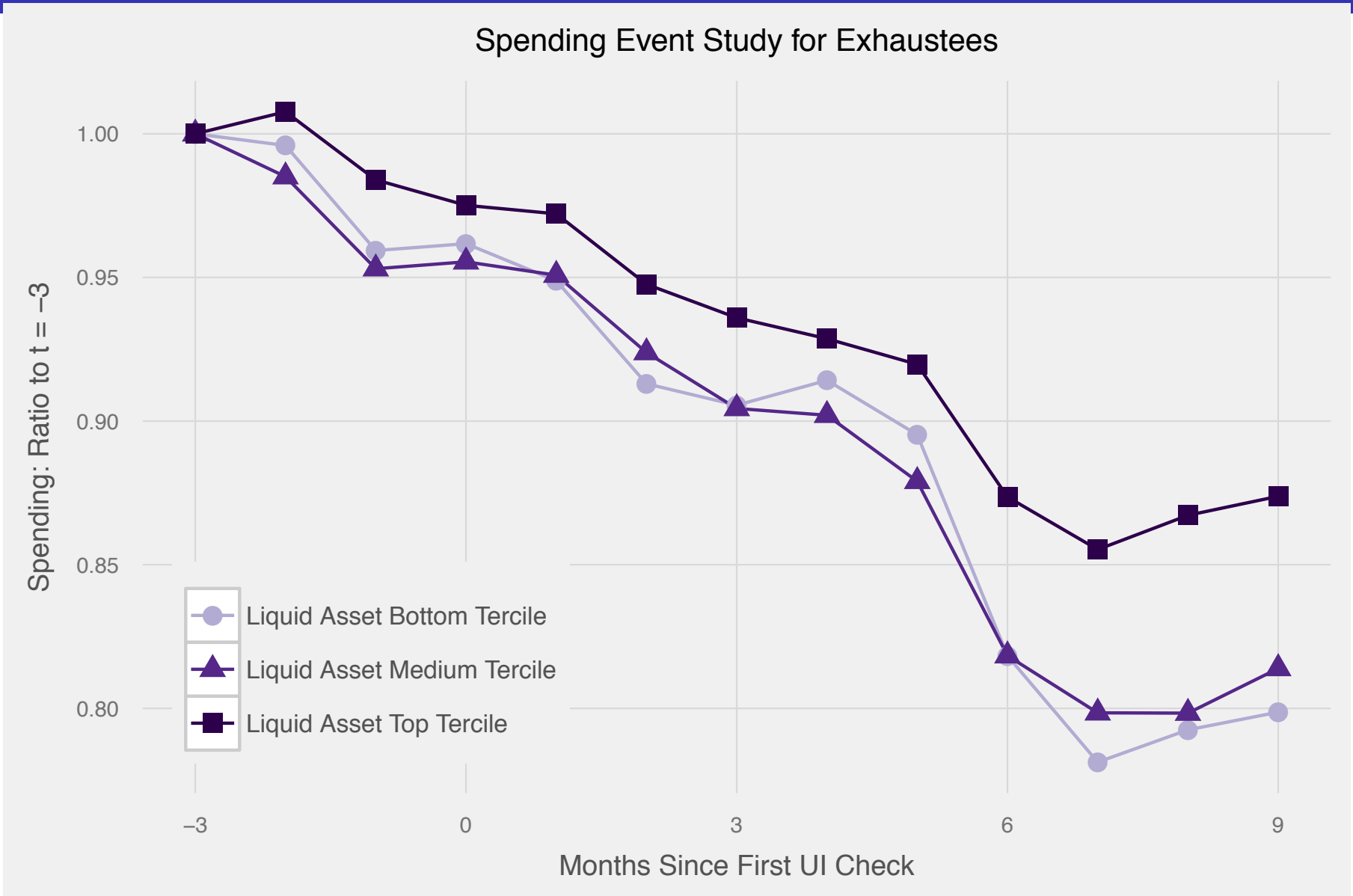
Exhaustion: Heterogeneity by Liquid Assets



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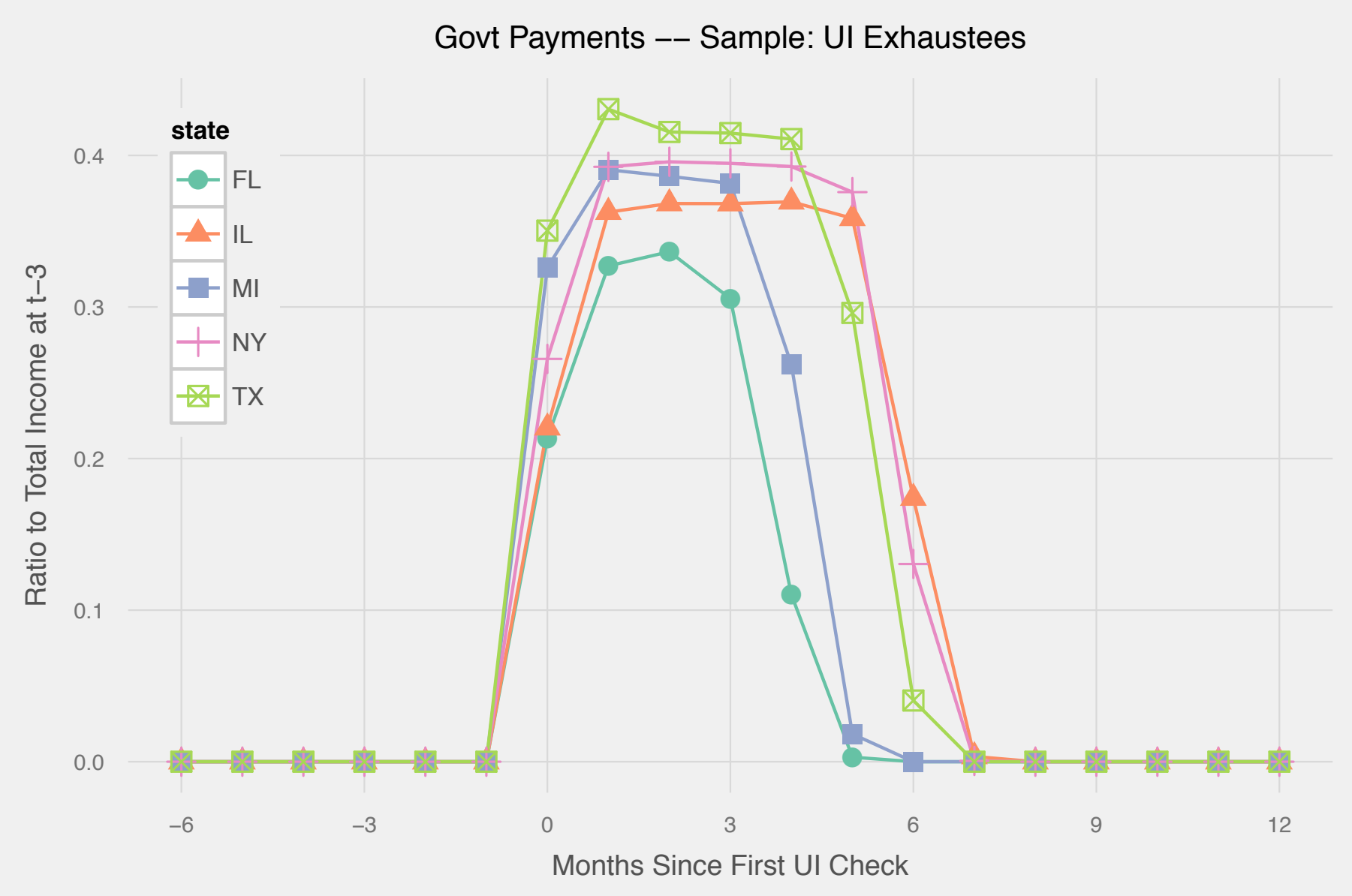
Exhaustion: Heterogeneity by State



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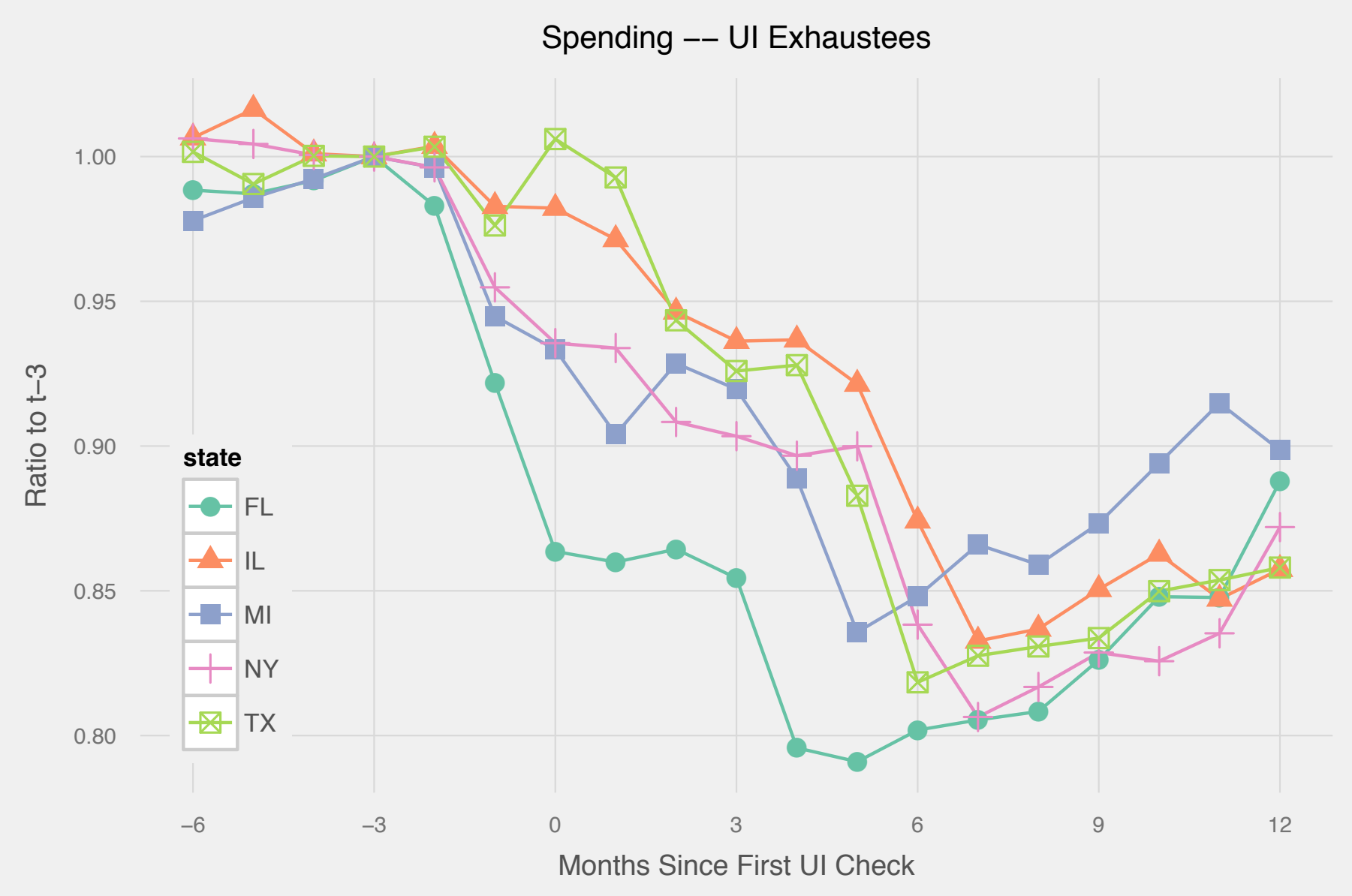
Exhaustion: Heterogeneity by State



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Details on Equivalent Variation Calculations

Fuchs-Schuendeln and Hassan (15) calculate z which solves

$$\underbrace{u(y+x+z)}_{MPC=1}+11u(y+z)=12\ \underbrace{u(y+\frac{x}{12})}_{\text{perm income}}$$

for CRRA utility with $\gamma=2$. We calculate

$$\sum_{t=1}^{15}u(c_t^{PIH})=\sum_{t=1}^{15}u(c_t^{data}+z)$$

$$\sum_{t=1}^{15}u(c_t^{hand-to-mouth})=\sum_{t=1}^{15}u(c_t^{data}-z)$$

$$\sum_{t=1}^{15}u(c_t^{buffer-stock})=\sum_{t=1}^{15}u(c_t^{data}+z)$$

using a 15-month horizon. For c_{data}, we assume that agent behaves optimally *after* date 7 and aggregate over all possible job-finding histories

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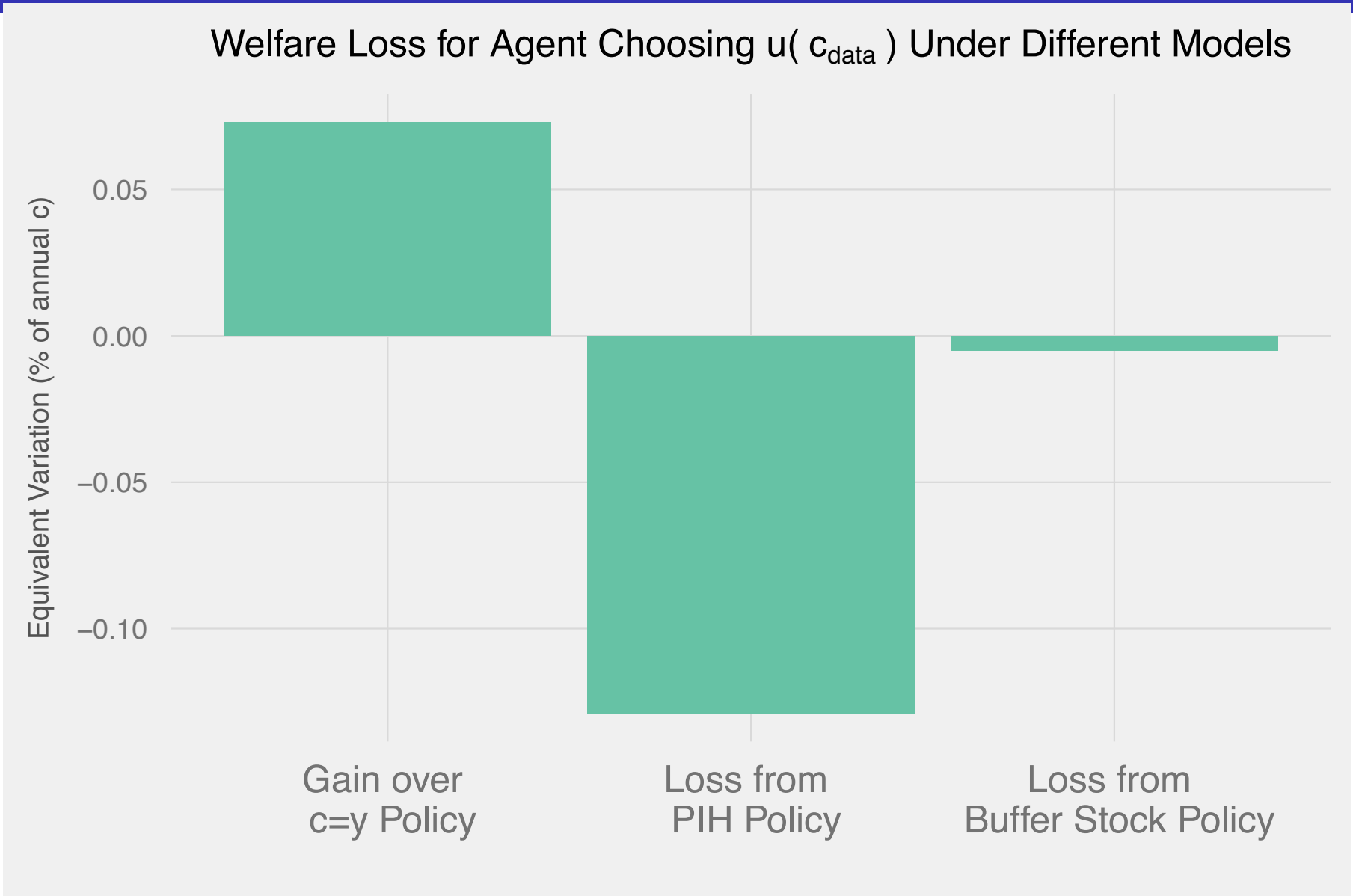
Welfare Loss Under Different Models



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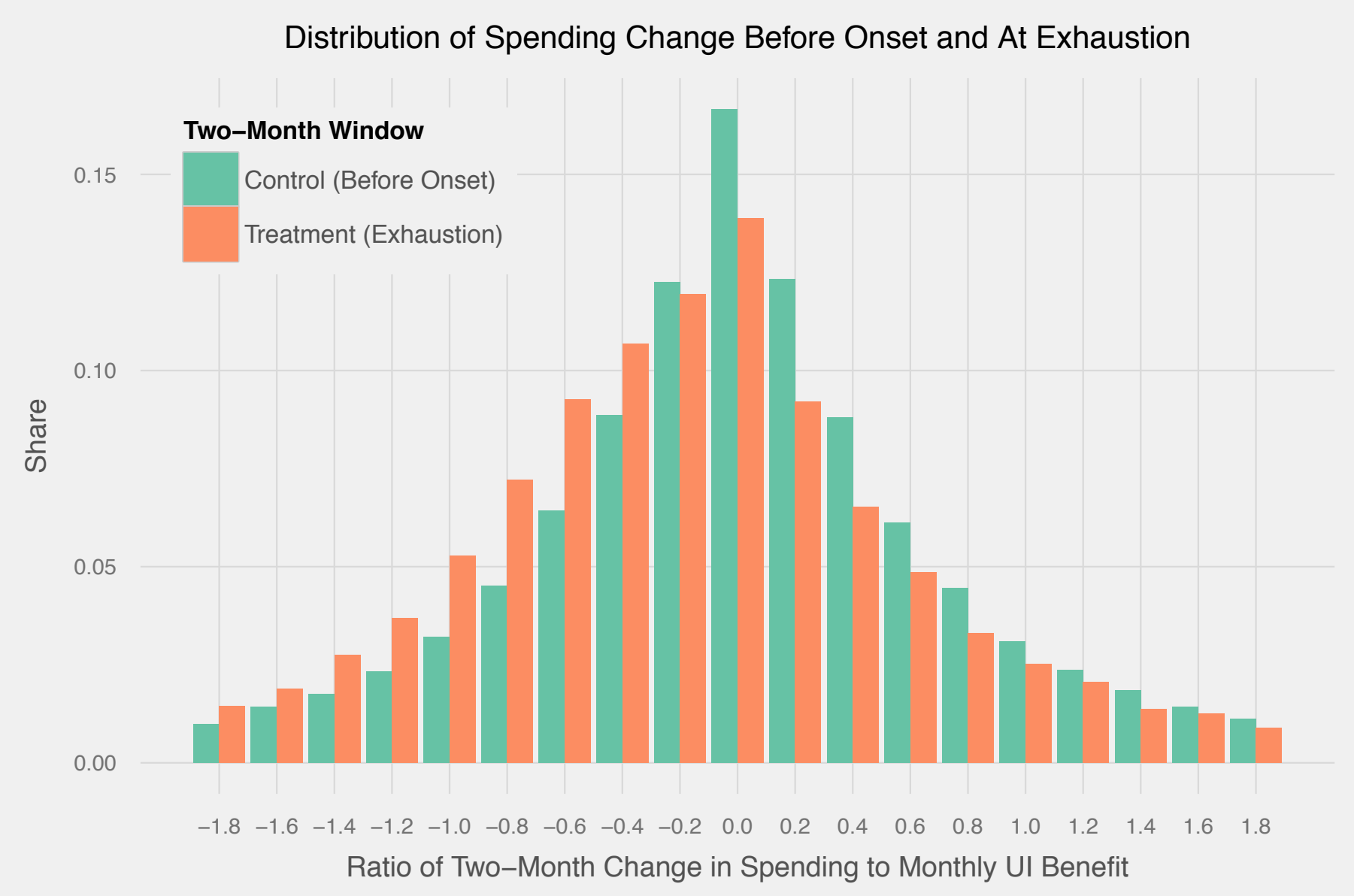
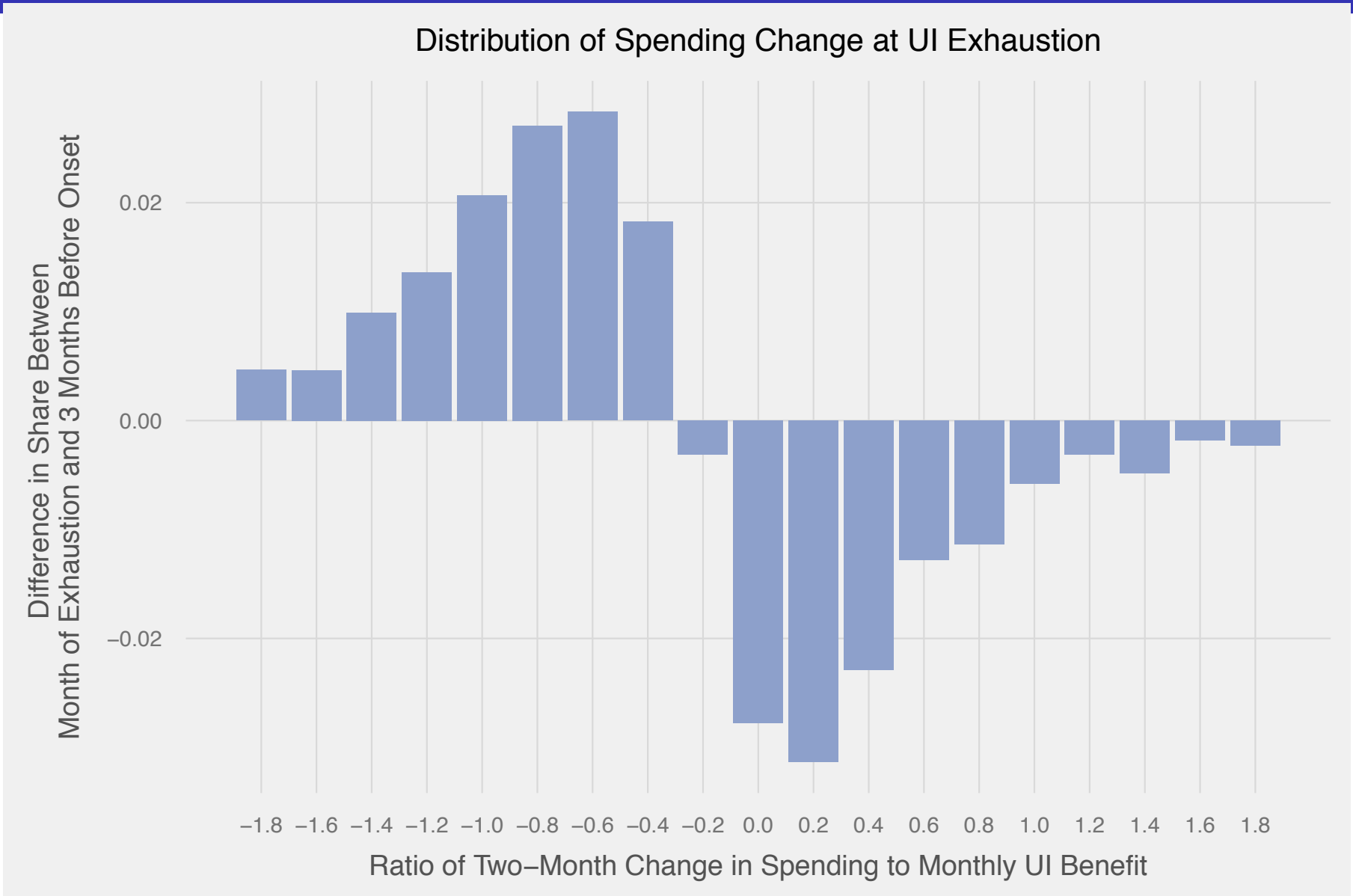
Distribution of Spending Changes



Distribution of Change in Spending at Benefit Exhaustion



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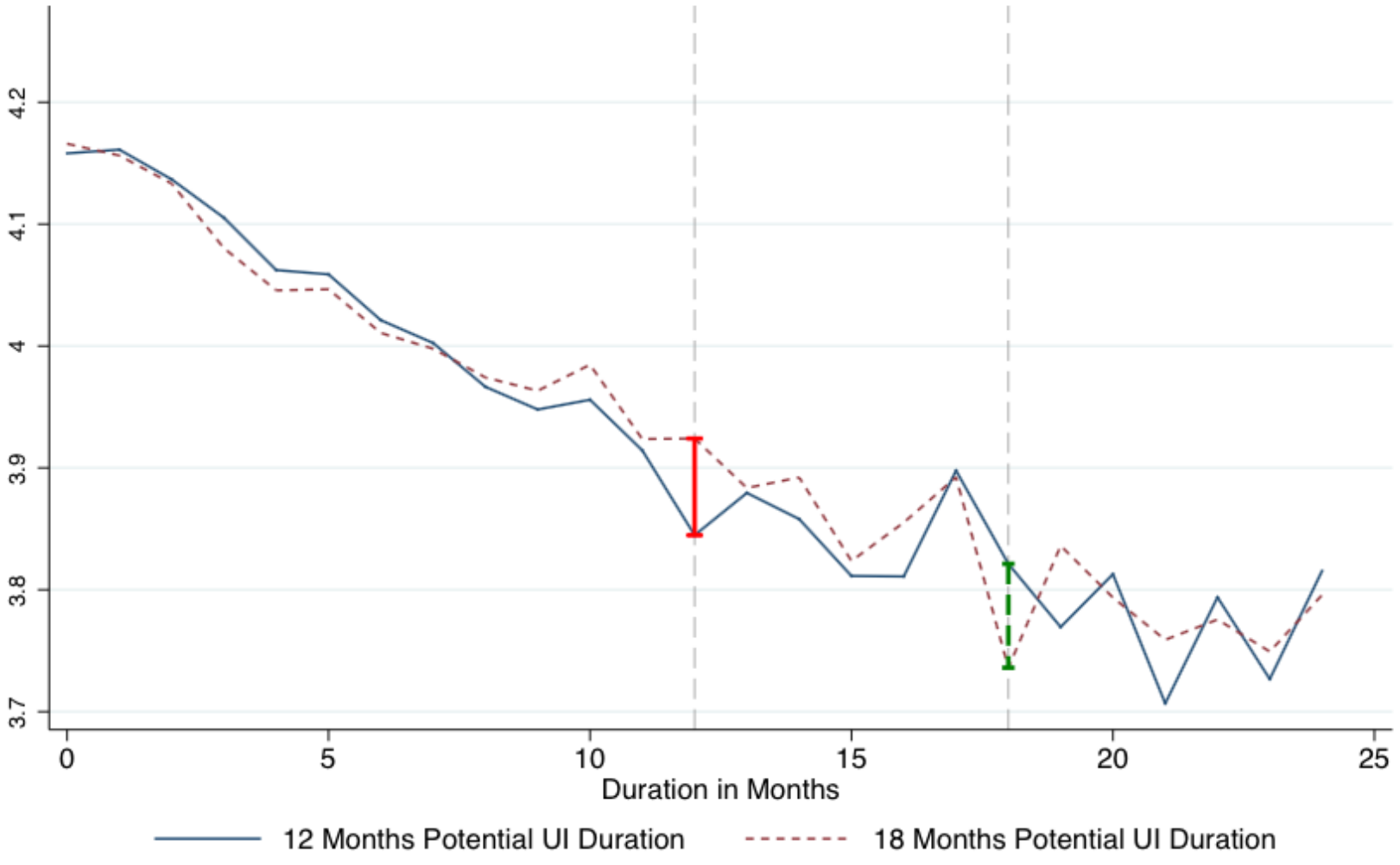
Schmieder, von Wacther and Bender (15) Figure 6

Reemployment wages in German UI data



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People Who Cut Spending Sooner Find a Job Faster – Heterogeneity

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