Financial Constraints and Consumers’ Response to Cash Flow News: Direct Evidence from Federal Tax Return Filings

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Research Question

• Life-Cycle/Permanent Income Hypothesis:
  – Households **should not** respond to **expected cash flows**.
    • Has been tested empirically.
  – Households **should** respond to **cash flow news** (where “news” is defined as deviation from the expected cash flow)
    • Has largely NOT been tested empirically.
  – Allows for differentiating between alternative hypotheses to the LCPIH
Financial constraints:
- Households show excess sensitivity because they are financially constrained, and are unable to smooth consumption (Zeldes 1989).

Myopia:
- Households are current income spenders, they consume cash when it arrives, irrespective of what is expected in the future (Flavin 1984).

The point of our paper is to test for financial constraints and myopia at the same time.
Empirical Setting

• Annual tax return filing in the United States.
• We observe the date in which households file their taxes, and thus learn what exactly their tax refund will be.
• We use deviations from the prior year’s return as our measure of “cash flow news”
• We observe the consumption response to the news and cash flow events.
• Is prior year’s tax return a good proxy for the expectation of the current year’s tax return?
Theoretical Predictions

<table>
<thead>
<tr>
<th></th>
<th>Rational</th>
<th>Myopic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Financial</td>
<td>Respond to news of unanticipated cash flows</td>
<td>Respond to news of anticipated cash flows</td>
</tr>
<tr>
<td>Constraints</td>
<td>(change)</td>
<td>(amount)</td>
</tr>
<tr>
<td>High Financial</td>
<td>Respond to cash flows</td>
<td>Respond to cash flows</td>
</tr>
<tr>
<td>Constraints</td>
<td></td>
<td></td>
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</tbody>
</table>

Baugh, Ben-David, and Park: Consumption Reaction to Tax Refund
Key Result: Reaction of Consumption

Change in Consumption vs. Surprise

- Cash flows
- Information
Key Result: Reaction of Consumption

- Change in Consumption
- Financial Constraints
- Cash flows
- Information
Literature

- Sensitivity of consumption to cash flow decreases with wealth (Zeldes 1989)
  - Sensitivity increases with financial constraints
- Sensitivity to paycheck / social security payments (Stephens 2003, 2006)
  - Sensitivity increases with financial constraints
- Agarwal and Qian (2013) use Singapore data to test the consumption response to stimulus
  - Find strong response following the announcement and following the disbursement
  - Use foreigners as control group
Empirical Setting

• Tax refund event has two dates:
  – Tax return filing: Information acquisition about tax refund
    • Identified as tax preparation fees (e.g., TurboTax)
  – Tax refund receipt: Actual cash flow is received
    • Identified as IRS direct payment

• We measure the consumption response around these two dates
Specification

• Dependent Variable: Daily dollar spending for Restaurant, Retail, and Grocery
• Include date and household fixed-effect

\[ y_{it} = \beta_0 + \beta_1 \times Filing Dummies_{it} + \beta_2 \times Refund Dummies_{it} + Date\ FE_t + Household\ FE_i + \epsilon_{it} \]

- Taxes Filed
- Distance Between Tax Filing and Refund Receipt
- Refund Received

Week Before Filing “Filing: Week -1”
Week After Filing “Filing: Week 0”
Week Before Refund “Refund: Week -1”
Week After Refund “Refund: Week 0”
Data

• Bank statements and credit card statements of over 500,000 households from an information aggregation service
• Households enter their bank and credit card account information
• The online service pulls their information automatically
• Data consists of credit card and bank statements (no balances)
  – Caveat: Cannot categorize checks
• Date range: Jan 2011–Jun 2011, Jan 2012–Jun 2012
Measuring Financial Constraints

• Income
  – Sum of all income electronic deposits

• Financial slack
  – Proxied by the “net bank balance”
    • Assumes borrowers receive 0.6% in bank interest and pay 20% in credit card interest

\[
\text{net bank balance} = \frac{0.5 \times (\text{Jan. bank interest} + \text{Feb. bank interest})}{0.006/12} \frac{0.5 \times (\text{Jan. credit card interest} + \text{Feb. credit card interest})}{0.20/12}
\]
## Summary Statistics

<table>
<thead>
<tr>
<th></th>
<th>Obs</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refund Amount</td>
<td>28,155</td>
<td>$3,153</td>
<td>$2,771</td>
</tr>
<tr>
<td>Surprise (= Refund Amount - Lag(Refund Amount))</td>
<td>28,155</td>
<td>($117)</td>
<td>$2,437</td>
</tr>
<tr>
<td>Days between filing and refund</td>
<td>28,155</td>
<td>10.8</td>
<td>8.4</td>
</tr>
<tr>
<td>Monthly Income</td>
<td>19,308</td>
<td>$5,614</td>
<td>$10,822</td>
</tr>
<tr>
<td>Monthly Bank Interest</td>
<td>26,917</td>
<td>$167.52</td>
<td>$2,555.16</td>
</tr>
<tr>
<td>Monthly Credit Card Interest (Unconditional)</td>
<td>28,155</td>
<td>$13.96</td>
<td>$52.16</td>
</tr>
<tr>
<td>Monthly Credit Card Interest (Conditional on paying interest)</td>
<td>5,574</td>
<td>$70.49</td>
<td>$98.78</td>
</tr>
<tr>
<td>Unconditional Restaurant Amount</td>
<td>10,304,730</td>
<td>$6.19</td>
<td>$16.76</td>
</tr>
<tr>
<td>Unconditional Retail Amount</td>
<td>10,304,730</td>
<td>$17.48</td>
<td>$57.59</td>
</tr>
<tr>
<td>Unconditional ATM Amount</td>
<td>10,304,730</td>
<td>$8.24</td>
<td>$61.80</td>
</tr>
<tr>
<td>Unconditional Credit Card Purchases Amount</td>
<td>10,304,730</td>
<td>$56.16</td>
<td>$158.13</td>
</tr>
<tr>
<td>Restaurant Amount (Conditional on non-zero values)</td>
<td>2,755,109</td>
<td>$23.16</td>
<td>$25.65</td>
</tr>
<tr>
<td>Retail Amount (Conditional on non-zero values)</td>
<td>2,555,616</td>
<td>$70.49</td>
<td>$98.17</td>
</tr>
<tr>
<td>ATM Amount (Conditional on non-zero values)</td>
<td>478,383</td>
<td>$177.41</td>
<td>$228.59</td>
</tr>
<tr>
<td>Credit Card Purchase Amount (Conditional on non-zero values)</td>
<td>4,115,217</td>
<td>$140.62</td>
<td>$225.24</td>
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</tbody>
</table>
Consumption Reaction to Filing and Refund Events (amount)

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Daily $ spent on …</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Restaurants</td>
<td>Retail</td>
<td>ATM</td>
<td>Total Credit Card</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Filing: Week -2</td>
<td>0.15***</td>
<td>-0.00</td>
<td>-0.05</td>
<td>1.68***</td>
</tr>
<tr>
<td>Filing: Week -1</td>
<td>0.03</td>
<td>-0.20</td>
<td>-0.18</td>
<td>1.19***</td>
</tr>
<tr>
<td><strong>Filing: Week 0</strong></td>
<td><strong>0.09</strong></td>
<td><strong>0.16</strong></td>
<td><strong>-0.05</strong></td>
<td><strong>6.53</strong>*</td>
</tr>
<tr>
<td>Filing: Week 1</td>
<td>0.06</td>
<td>-0.00</td>
<td>-0.12</td>
<td>1.28**</td>
</tr>
<tr>
<td>Filing: Week 2</td>
<td>0.11*</td>
<td>-0.01</td>
<td>-0.27</td>
<td>0.64</td>
</tr>
<tr>
<td>Filing: Week 3</td>
<td>0.04</td>
<td>0.29*</td>
<td>0.05</td>
<td>0.48</td>
</tr>
<tr>
<td>Refund: Week -2</td>
<td>0.16***</td>
<td>0.20</td>
<td>-0.11</td>
<td>0.98**</td>
</tr>
<tr>
<td>Refund: Week -1</td>
<td><strong>0.19</strong>*</td>
<td>0.80***</td>
<td>0.11</td>
<td>0.95*</td>
</tr>
<tr>
<td><strong>Refund: Week 0</strong></td>
<td><strong>0.50</strong>*</td>
<td><strong>2.21</strong>*</td>
<td><strong>1.26</strong>*</td>
<td><strong>0.78</strong></td>
</tr>
<tr>
<td>Refund: Week 1</td>
<td><strong>0.49</strong>*</td>
<td>1.59***</td>
<td><strong>0.43</strong></td>
<td><strong>1.62</strong>*</td>
</tr>
<tr>
<td>Refund: Week 2</td>
<td><strong>0.26</strong>*</td>
<td>1.28***</td>
<td>0.31*</td>
<td><strong>2.06</strong>*</td>
</tr>
<tr>
<td>Refund: Week 3</td>
<td><strong>0.28</strong>*</td>
<td>0.81***</td>
<td>0.11</td>
<td><strong>0.94</strong></td>
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<tr>
<td>Obs</td>
<td>10,304,730</td>
<td>10,304,730</td>
<td>10,304,730</td>
<td>10,304,730</td>
</tr>
<tr>
<td>Adj. R2</td>
<td>0.093</td>
<td>0.062</td>
<td>0.077</td>
<td>0.130</td>
</tr>
<tr>
<td>Unconditional mean</td>
<td>$6.19</td>
<td>$17.48</td>
<td>$8.24</td>
<td>$56.16</td>
</tr>
<tr>
<td>Filing: Week 0 / Unconditional mean</td>
<td>0.9%</td>
<td>-0.6%</td>
<td>11.6%</td>
<td></td>
</tr>
<tr>
<td>Refund: Week 0 / Unconditional mean</td>
<td>12.6%</td>
<td>15.3%</td>
<td>1.4%</td>
<td></td>
</tr>
</tbody>
</table>

- Fixed effects: Household, date
- Dummied for weeks 4-11 following refund
Consumption Reaction to Filing and Refund Events (amount)

Time Series Response to Filing and Refund

- Restaurants
- Retail
- ATM

Abnormal Consumption

Week Number

After Filing: -2
After Filing: 0
After Filing: 3
After Refund: -2
After Refund: 0
After Refund: 3
After Refund: 5
After Refund: 7
After Refund: 9
After Refund: 11
We show that while households show a stronger consumption response according to the size of the refund, they show almost no response to the news, large or small.
Surprise Doesn’t Matter

![Graph showing restaurant expenditures over different surprise quintiles.]
Surprise Doesn’t Matter

Retail Expenditures

- Week of Filing
- Week of Refund

Surprise Quintile (1 = Most Negative Surprise)
Surprise Doesn’t Matter

ATM Withdrawals

- Week of Filing
- Week of Refund

Abnormal Expenditures

-30%
-20%
-10%
0%
10%
20%
30%
40%

Surprise Quintile (1 = Most Negative Surprise)
Surprise Doesn’t Matter

![Graph showing the relationship between Total Credit Card Expenditures and Surprise Quintile. The graph compares the Week of Filing and Week of Refund, with a y-axis representing Abnormal Expenditures ranging from -10% to 20%, and an x-axis representing Surprise Quintile (1 = Most Negative Surprise).]
Surprise Doesn’t Matter

Payments to Credit Card

- Week of Filing
- Week of Refund

Abnormal Payments

Surprise Quintile (1 = Most Negative Surprise)
Refund Amount Matters

Restaurant Expenditures

- Week of Filing
- Week of Refund

Abnormal Expenditures

Refund Amount Quintile (1 = Smallest Refund)
Refund Amount Matters

Retail Expenditures

- Week of Filing
- Week of Refund

Abnormal Expenditures

Refund Amount Quintile (1 = Smallest Refund)
Refund Amount Matters

ATM Withdrawals

- Week of Filing
- Week of Refund

Abnormal Expenditures

Refund Amount Quintile (1 = Smallest Refund)
Refund Amount Matters

![Graph showing Total Credit Card Expenditures over time for different refund quintiles. The graph compares the Week of Filing and Week of Refund expenditures. The x-axis represents Refund Amount Quintile (1 = Smallest Refund), and the y-axis shows abnormal expenditures as a percentage. The graph indicates that higher refund quintiles lead to higher abnormal expenditures.]
Refund Amount Matters

Payments to Credit Card

- Week of Filing
- Week of Refund

Abnormal Payments

Refund Amount Quintile (1 = Smallest Refund)
Households respond primarily to cash flows than to news

An potential explanation is that this is because of financial constraints, and the average household in each refund quintile is financially constrained, therefore unable to respond to news

- Previous research shows that unconstrained households show weak/no response at various cash flow events
- We divide the sample by income and find that even for high income households the consumption response to cash > news
- There is some statistically significant response for unconstrained households for news, so financial constraints play some, but limited role
Restaurant Spending, per Income Group

![Graph showing restaurant expenditures by income quintile. The graph compares average abnormal expenditures during the week of filing and the week of refund. The x-axis represents income quintile with 1 being the lowest income, and the y-axis shows the percentage change in expenditures. The graph indicates different trends for each income quintile.](image-url)
Retail Spending, per Income Group

Retail Expenditures

- Week of Filing
- Week of Refund

Income Quintile (1 = Lowest Income)

Abnormal Expenditures
Credit Card Spending, per Income Group

Total Credit Card Expenditures

- Week of Filing
- Week of Refund

Abnormal Expenditures

Income Quintile (1 = Lowest Income)
Credit Card Payments

Payments to Credit Card

- Week of Filing
- Week of Refund

Income Quintile (1 = Lowest Income)
Conclusion

• New empirical setting to measure the reaction of households to news vs. cash flow events

• Households show virtually no consumption response news event
  – Weak total reaction to news
  – Strong variation with refund size

• Financial constraints prevent households from consuming when they receive information
  – Wealthier households show less sensitivity
  – Credit card usage is concentrated around information date

• We find evidence that support both financial constraints and household myopia