Identifying “Tipping Points” in Consumer Liabilities Using High Frequency Data

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*These are my own views, and not necessarily the views of the Federal Reserve Bank of St. Louis, Federal Reserve System, or the Board of Governors*
Introduction

- The Great Recession was in many ways a balance-sheet recession.
- Overly leveraged household balance sheets left families economically fragile.
- Macroeconomic shocks pushed households past their respective “tipping points”.
- Our paper examines whether a “tipping point” can be predicted.
Research Questions

- Can high-frequency data estimate a payment/income ratio which will quantify and predict a “tipping point”?
- Our measure captures increasing financial duress the most for consumers with exceptional leverage.
- Does our payment/income ratio outperform other measures of default risk? Why or why not?
- Movement in FICO score captures more information. There are omitted factors which are limitations.
Methodology

- **CRISM**: Merge of Equifax credit bureau information with mortgage-level McDash servicing data.
- Sample of consumers experiencing bankruptcy or foreclosure; starts in June 2005 and ends in Dec. 2014.
- In lieu of measured income, Equifax has developed a product known as the **Personal Income Model**.
- Track total debt payment/income ratio 15 months prior to and after default.
## Summary Statistics

**December 2007**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Defaulting Consumers</th>
<th>Non-defaulting Consumers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Debt (Thous. $)</td>
<td>293</td>
<td>249</td>
</tr>
<tr>
<td></td>
<td>(319)</td>
<td>(302)</td>
</tr>
<tr>
<td>Monthly Payment ($)</td>
<td>3,218</td>
<td>2,884</td>
</tr>
<tr>
<td></td>
<td>(5,998)</td>
<td>(7,274)</td>
</tr>
<tr>
<td>Personal Income (Thous. $)</td>
<td>45</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>(19)</td>
<td>(24)</td>
</tr>
<tr>
<td>Payment/Income (Ratio)</td>
<td>81</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>(123)</td>
<td>(105)</td>
</tr>
<tr>
<td>Seriously Delinquent Balance ($)</td>
<td>12,366</td>
<td>484</td>
</tr>
<tr>
<td></td>
<td>(62,226)</td>
<td>(10,124)</td>
</tr>
<tr>
<td>FICO Score</td>
<td>622</td>
<td>724</td>
</tr>
<tr>
<td></td>
<td>(104)</td>
<td>(82)</td>
</tr>
<tr>
<td>Sample Size</td>
<td>80,425</td>
<td>161,647</td>
</tr>
</tbody>
</table>

**NOTE:** Standard deviation in parentheses.

**SOURCE:** Equifax Credit Risk Insight Servicing Data
Mean FICO Score

Mean FICO Score Before and After Default

Score

-15 -10 -5 0 5 10 15
Months Before/After Event

Bankruptcy
Foreclosure

Source: Equifax Credit Risk Insight Servicing Data
Mean Payment/Income Ratio

Mean Payment-Income Ratio Before and After Default

Source: Equifax Credit Risk Insight Servicing Data

Bankruptcy • Foreclosure
Mean FICO Score, 4th Quartile of P/I Ratio

Mean FICO Score Before and After Default: Fourth Quartile

Score

-15 -10 -5 0 5 10 15

Months Before/After Event

Bankruptcy Foreclosure

Source: Equifax Credit Risk Insight Servicing Data
Mean FICO Score, 3\textsuperscript{rd} Quartile of P/I Ratio

![Graph showing Mean FICO Score Before and After Default: Third Quartile](image)

Source: Equifax Credit Risk Insight Servicing Data
Mean FICO Score, 2nd Quartile of P/I Ratio

Mean FICO Score Before and After Default: Second Quartile

Score

-15 -10 -5 0 5 10 15
Months Before/After Event

Bankruptcy  Foreclosure

Source: Equifax Credit Risk Insight Servicing Data
Mean FICO Score, 1\textsuperscript{st} Quartile of P/I Ratio

Source: Equifax Credit Risk Insight Servicing Data
Mean P/I Ratio, 4th Quartile of P/I Ratio

Mean P/I Ratio Before and After Default, Fourth Quartile

Ratio vs. Months Before/After Event

- Bankruptcy
- Foreclosure

Source: Equifax Credit Risk Insight Servicing Data
Mean P/I Ratio, 3rd Quartile of P/I Ratio

Mean P/I Ratio Before and After Default, Third Quartile

Source: Equifax Credit Risk Insight Servicing Data
Mean P/I Ratio, 2nd Quartile of P/I Ratio

Mean P/I Ratio Before and After Default, Second Quartile

Ratio

Months Before/After Event

Bankruptcy

Foreclosure

Source: Equifax Credit Risk Insight Servicing Data
Mean P/I Ratio, 1^{st} Quartile of P/I Ratio

Mean P/I Ratio Before and After Default, First Quartile

Source: Equifax Credit Risk Insight Servicing Data
The P/I ratio performs well for most highly leveraged consumers but is uninformative for the rest.

Movement in the FICO score captures increasing financial duress consistently across quartiles of P/I.

Modeled P/I ratio omits other important factors such as availability of assets.

Consumer-initiated default (bankruptcy) quickly provides relief while distress worsens after foreclosure.
Conclusions

- Similar to sovereign debt, increasing household leverage is not a perfect signal of impending default.

- High frequency data on the entire household balance sheet remains elusive.

- Personal bankruptcy appears to be far more restorative for consumer balance sheets.