To Pay or Autopay? Fintech Innovation and Credit Card Payments

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Jialan Wang, University of Illinois at Urbana-Champaign & NBER
jialanw@gmail.com
How Does Technology Affect Credit Card Payment Behavior?

Causal effect of autopay for fintech credit card borrowers

- Two underwriting changes as shocks to autopay enrollment
- Estimate causal effect using RDD
- **Benchmark**: 20% of credit card accounts enrolled in autopay as of 2020, increasing over time (CFPB 2021)

> 35% of payments cluster around the minimum - Keys & Wang (2019)
Related Literatures on Consumer Behavior, Credit Cards, and Fintech

• Credit card payment behavior
  Sakaguchi Stewart Gathergood Adams Guttman-Kenney Hayes Hunt (2022); Gathergood Sakaguchi Stewart Weber (2022); Kuchler Pagel (2021); Medina (2020); Keys Wang (2019); Gathergood Mahoney Stewart Weber (2019); Adams Guttman-Kenney Hayes Hunt Laibson Stewart (2018)

• Financial technology and open banking
  D’Acunto Prabhala Rossi (2019); Carlin Olafsson Pagel (2019); Philippon (2016); Goldstein Jiang Karolyi (2019); Thakor (2020); Berg Fuster Puri (2022); Babina Buchak Gornall (2022); Nam (2023)

• Regulation and competition
Significant Policy Interest in Open Banking

CFPB Kicks Off Personal Financial Data Rights Rulemaking

Proposals under consideration would fuel market competition and strengthen consumer data rights

OCT 27, 2022
Research Setting: Underwriting Change → Autopay Enrollment

1. Underwriting change → small increase / decrease in frictions to autopay enrollment
   a) Cashflow underwriting → requirement to link bank account → more salient prompt to opt in to autopay
   b) One positive and one negative nudge to autopay enrollment

2. Effects of autopay on payment outcomes
   a) Use date of account opening as IV for autopay enrollment via RDD
   b) Effects on minimum payments, delinquency, overall payments, etc
Key Finding: Autopay Has Large Effects on Minimum Payments

- First stage: Autopay enrollment “nudge” highly sticky → accounts for half of all enrollment!

- Effects of autopay:
  - More minimum payments → could contribute to bimodal distribution
  - Reduces charge-offs in one of two experiments
Autopay Opt-in Settings

Now, choose your monthly payment settings

- Full statement balance
  - Automatically pay your statement balance by the due data to avoid interest charges

- Minimum payment
  - Automatically pay the minimum due amount each month

- AutoPay off
  - By selecting "Done", you authorize ABC Corp to make withdrawals from your account, as provided in the Full Statement Balance Autopay Terms

- Minimum payment
  - By selecting "Done", you authorize ABC Corp to make withdrawals from your account, as provided in the Minimum Payment Autopay Terms

- AutoPay off
  - Turn AutoPay off and make your payments manually each month

Are you sure you want AutoPay off? We recommend setting up recurring payments so you never miss a bill or damage your credit score. You can always cancel or change the amount before you pay

Done

Done

Done
Manual Payment Interface

Dashboard
You have a payment due in 5 days
Pay now

Current Balance
$130
Oct Charges $30
Statement Balance $100
Available $370

Make a payment
Pay at least the minimum by Nov 23

Pay
$90

Remaining $10
Estimated interest $0.13

You are paying
$90
On Nov 18
From Chase...8023

Savings
You are authorizing the one-time payment outlined above. By tapping “Confirm payment” you confirm you have reviewed and agree to our terms and conditions. As a reminder, same day cancellations are not accepted.

Confirm payment
Cancel

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How Much Do You Want to Pay?

- **$39.00 - Minimum Payment Due**
  This amount is included in your scheduled AutoPay payment on Feb 22, 2020.

- **$2,619.70 - Last Statement Balance**
  This is the total amount that is scheduled to be paid by AutoPay payment on Feb 22, 2020.

- **$2,669.70 - Current Balance**
  This is the balance on the account.

- **Custom Amount**
  $ Enter amount

You are paying

$90

On Nov 18

From Chase ...8023

Savings

You are authorizing the one-time payment outlined above. By tapping “Confirm payment” you confirm you have reviewed and agree to our terms and conditions. As a reminder, same day cancellations are not accepted.

Confirm payment

Cancel
### Figure 7: Example of Three-Year Repayment Disclosure Mandated by the CARD Act

<table>
<thead>
<tr>
<th>If you make no additional charges using this card and each month you pay...</th>
<th>You will pay off the balance shown on this statement in about...</th>
<th>And you will end up paying an estimated total of...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only the minimum payment</td>
<td>11 years</td>
<td>$4,745</td>
</tr>
<tr>
<td>$103</td>
<td>3 years</td>
<td>$3,712 (Savings = $1,033)</td>
</tr>
</tbody>
</table>

Figure 7: Example of Three-Year Repayment Disclosure Mandated by the CARD Act

If you make no additional charges using this card and each month you pay...

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</tbody>
</table>

And you will end up paying an estimated total of...

Source: Federal Reserve Board:
http://www.federalreserve.gov/consumerinfo/wynk_creditcardrules.htm. Accessed...
Descriptive Statistics
Sample: Fintech Consumers Have Lower Scores and Credit limits

Customers from fintech credit card company

- 2018-2020 (63k accounts)
- Limited demographics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>$44,363</td>
</tr>
<tr>
<td>Vantage at application</td>
<td>664</td>
</tr>
<tr>
<td>Enrolled in autopay</td>
<td>27%</td>
</tr>
<tr>
<td>Credit limit</td>
<td>$1,839</td>
</tr>
<tr>
<td>Retail APR</td>
<td>21%</td>
</tr>
</tbody>
</table>
Auto-payers are More Bimodal
Auto-payers Have Fewer Delinquencies

![Bar chart showing the percentage of account-months with delinquencies across different payment methods and credit scores. The chart compares manual payments against autopayments for credit scores below minimum (Min), exact minimum (Exact Min), near minimum (Near Min), intermediate, and full. The autopay method consistently shows lower delinquency rates across all credit score categories.]
Regression
Discontinuity Design:

effects of changes in underwriting on autopay opt-in and payment outcomes
**RDD: Underwriting Changes Instrument for Autopay Enrollment**

Two-stage design using origination date as the running variable

\[ Y_{it} = \alpha + \beta Autopay_{it} + X_{it} + \epsilon_{it} \]

\[ Autopay_{it} = \alpha + \beta Post_{i} + \gamma OrigDate_{i}^{n} + \kappa (Post_{i} \times OrigDate_{i}^{n}) + X_{it} + \epsilon_{it} \]

- With and without controls \( X_{it} \):
  - calendar month, state, and origination channel fixed effects
  - account age and account age squared
  - quintiles of vantage, income, and age at application, and APR
**First Stage: Autopay Enrollment**

First Underwriting Change

Second Underwriting Change

- Enrolled in autopay
- Cashflow required
First Stage: Persistence of Autopay

First Underwriting Change

Second Underwriting Change
### IV: Autopay ➔ Minimum Payments

<table>
<thead>
<tr>
<th>Linear specification</th>
<th>No controls</th>
<th>First Change</th>
<th>Second Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Regression coefficient</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Regression coefficient</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(coefficient)</td>
</tr>
<tr>
<td>Chargeoff</td>
<td>Paid Min to full</td>
<td>Paid Full</td>
<td>Fraction Paid</td>
</tr>
<tr>
<td>Mean</td>
<td>10%</td>
<td>28%</td>
<td>38%</td>
</tr>
<tr>
<td>Regression coefficient</td>
<td>- 0.191</td>
<td>0.294</td>
<td>- 0.229</td>
</tr>
<tr>
<td></td>
<td>(0.011)</td>
<td>(0.018)</td>
<td>(0.020)</td>
</tr>
<tr>
<td></td>
<td>[0.000]</td>
<td>[0.000]</td>
<td>[0.000]</td>
</tr>
<tr>
<td>Mean</td>
<td>12%</td>
<td>19%</td>
<td>43%</td>
</tr>
<tr>
<td>Regression coefficient</td>
<td>0.064</td>
<td>0.273</td>
<td>- 0.263</td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.032)</td>
<td>(0.038)</td>
</tr>
<tr>
<td></td>
<td>[0.001]</td>
<td>[0.000]</td>
<td>[0.000]</td>
</tr>
</tbody>
</table>
IV: Persistence of Autopay Effects

First Change

Second Change
IV: Persistence of Autopay Effects

**First Change**

**Delinquency**

**Paid minimum**

**Paid full**

**Second Change**

**Delinquency**

**Paid minimum**

**Paid full**
Key Conclusion: Autopay Has Large Effects on Minimum Payments

- Autopay enrollment is sensitive to nudges, highly persistent
- Autopay dramatically increases minimum payments
  - Reduces intermediate payments → contributes to bimodal distribution
  - Reduces charge-offs in one of two experiments
  - Inconclusive effect on overall payment amounts
Appendix slides
Reduced form: First Underwriting Change

Unconditional binscatters

Delinquency

Paid minimum

Chargeoff

Paid full

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Reduced form: Second Underwriting Change

Unconditional binscatters

Delinquency

Paid minimum

Chargeoff

Paid full
Control Coefficients: First Underwriting Change

Control coefficients for autopay enrollment (first stage)
Control Coefficients: Second Underwriting Change

Control coefficients for autopay enrollment (first stage)