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)
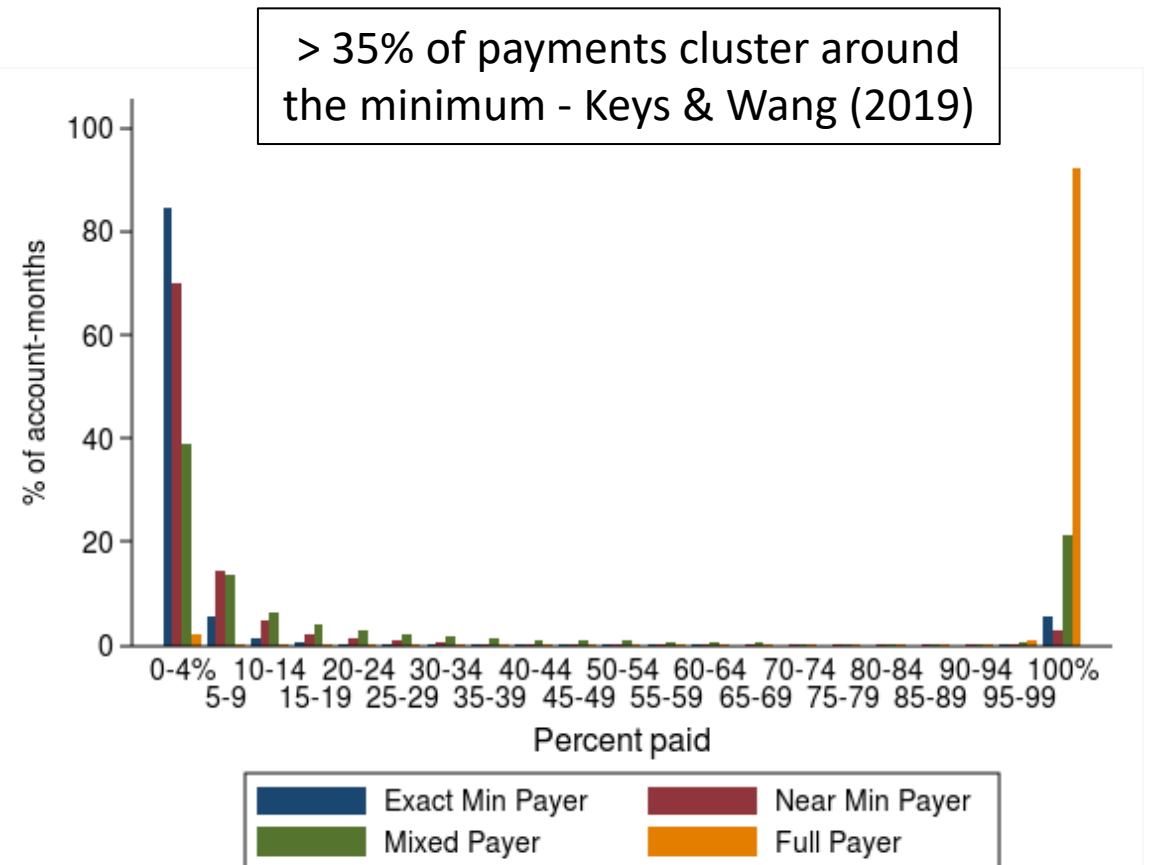
Related Literatures on Consumer Behavior, Credit Cards, and Fintech

- ## 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

  Agarwal Chomsisengphet Mahoney Stroebel (2014, 2017); Stango Zinman (2015); Ru Schoar (2016); Nelson (2018); Gross Kluender Liu Notowidigdo Wang (2021)

Significant Policy Interest in Open Banking

# 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
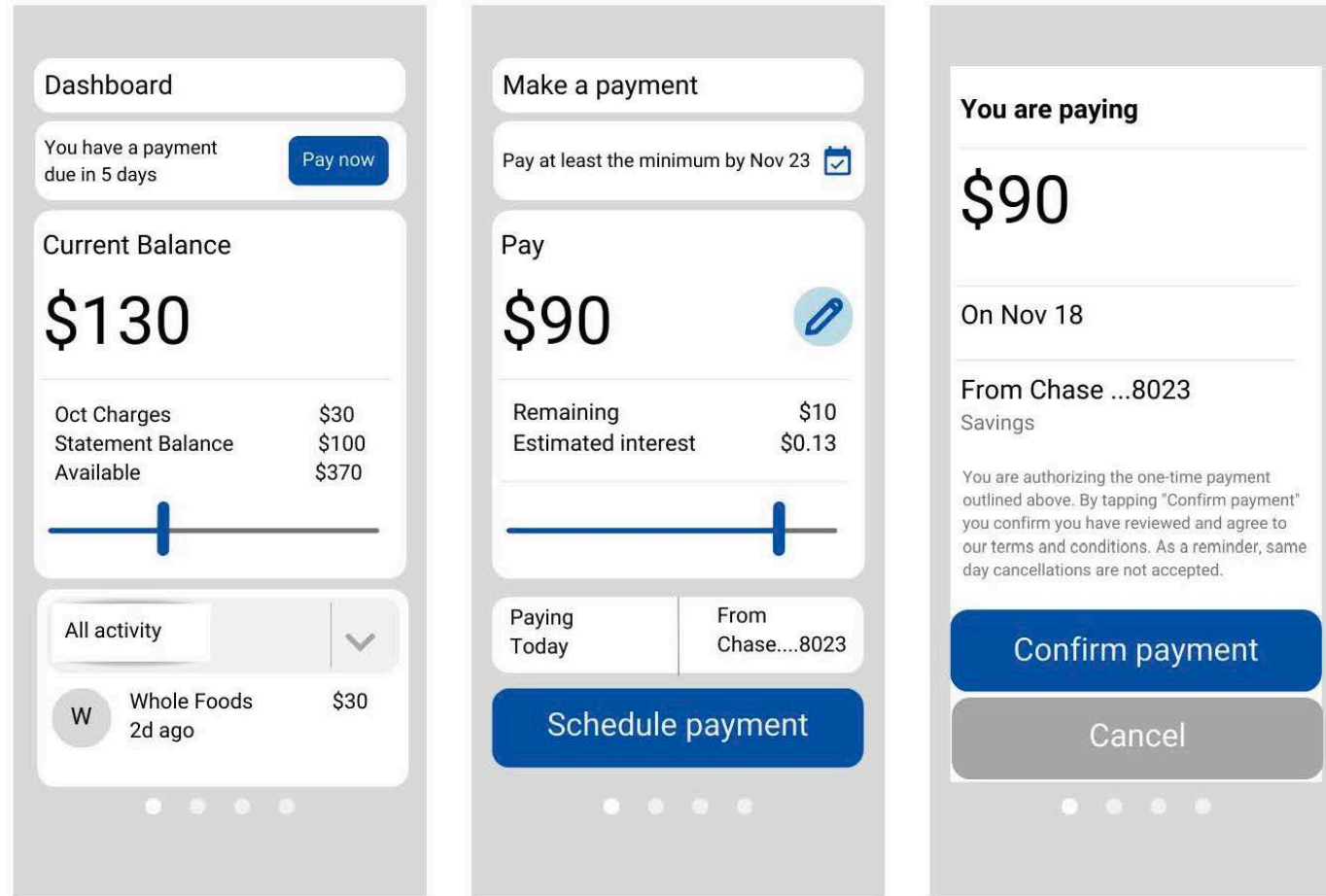
   b) Effects on minimum payments, delinquency, overall payments, etc

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
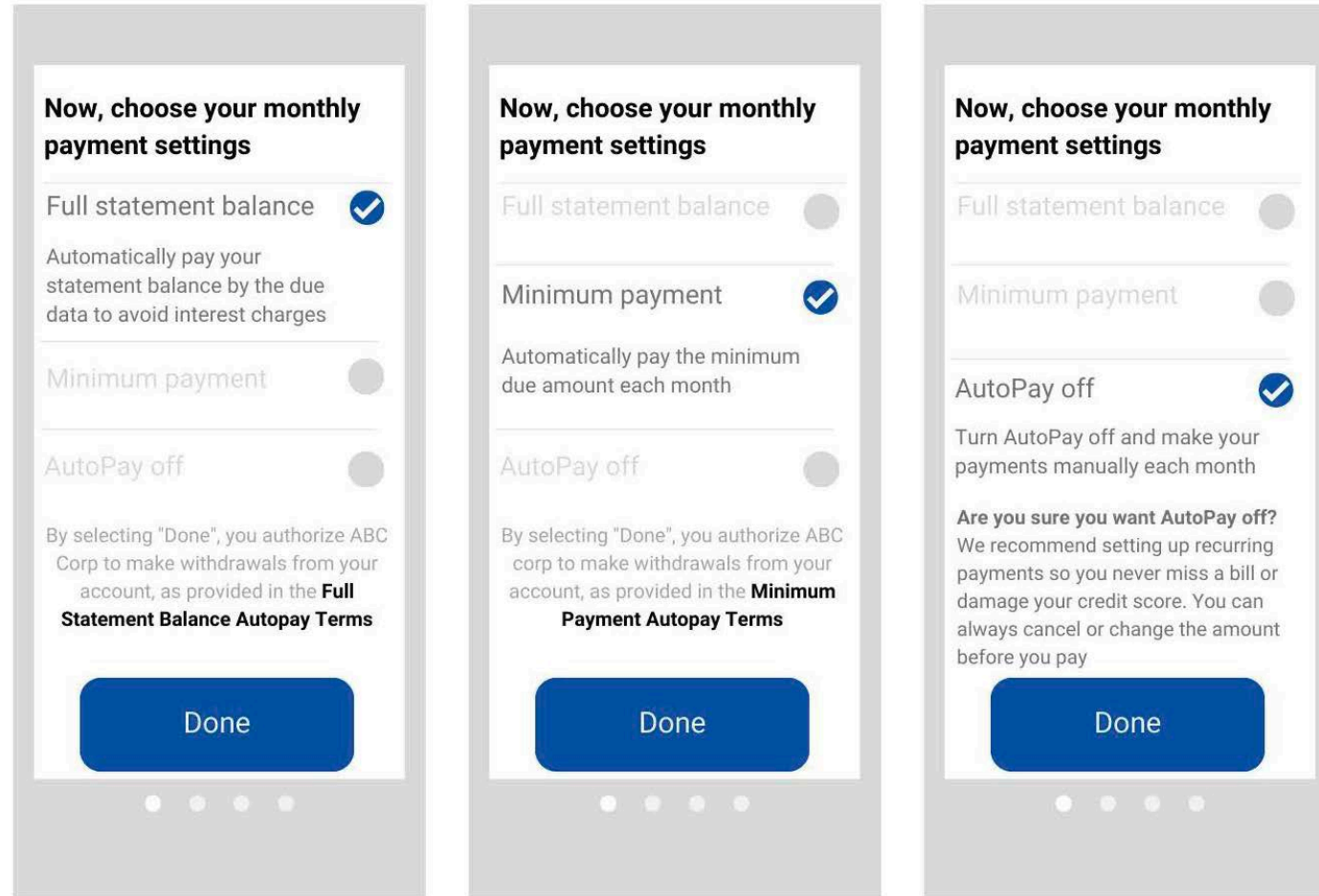
Manual Payment Interface

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. ⑦

◯ **$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

...ment Interface

...ayment

...the minimum by Nov 23 🗓

✏️

...g $10
...d interest $0.13

From Chase....8023

...edule payment

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
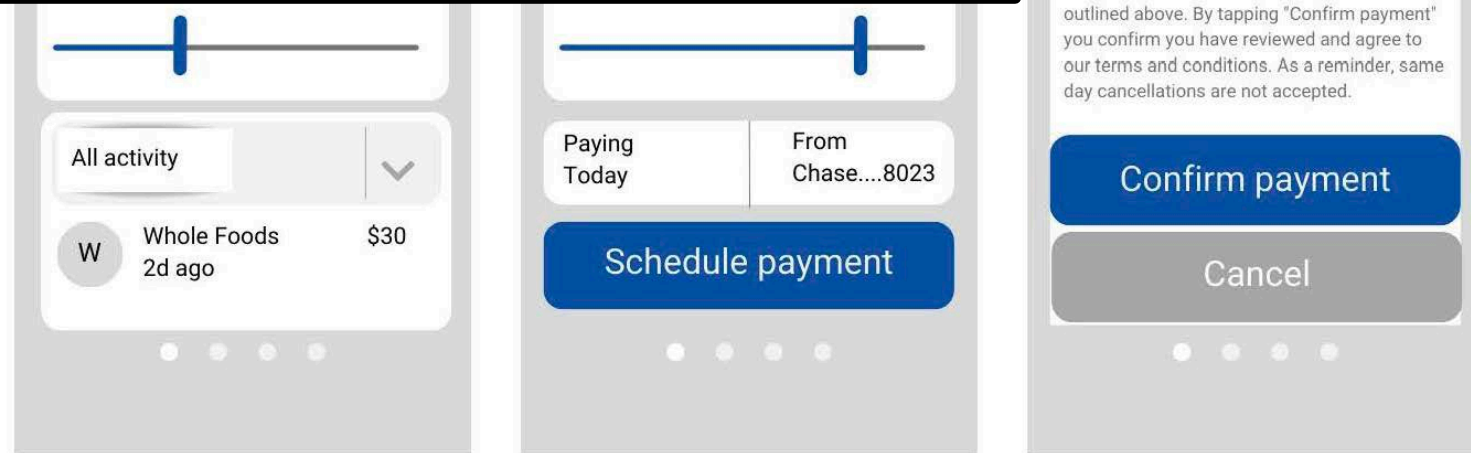
Cancel

...nterface

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...	You will pay off the balance shown on this statement in about...	And you will end up paying an estimated total of...
Only the minimum payment	11 years	$4,745
$103	3 years	$3,712 (Savings = $1,033)

Source: Federal Reserve Board: http://www.federalreserve.gov/consumerinfo/wyntk_creditcardrules.htm. Accessed February, 2013.

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

All activity

W Whole Foods $30
   2d ago

Paying Today | From Chase....8023

Schedule payment

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...	You will pay off the balance shown on this statement in about...	And you will end up paying an estimated total of...
Only the minimum payment	11 years	$4,745
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http://www.federalreserve.gov/consumerinfo/wyntk_creditcardrules.htm. Access

nterface

All activity

W Whole Foods $30
   2d ago

Paying
Today
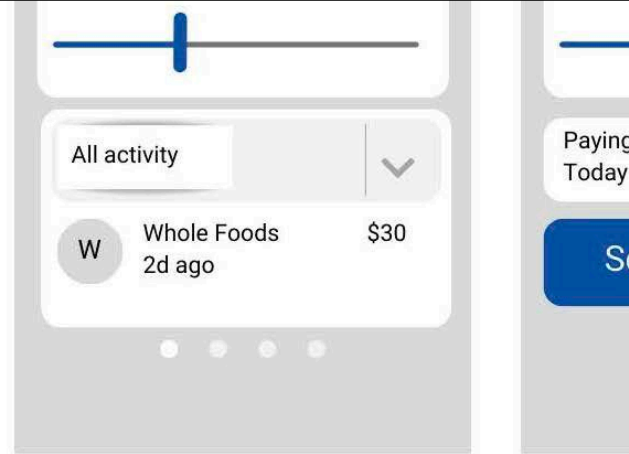
Figure 8: Effect of CARD Act Disclosures on Payments

Panel A. Cross-Sectional Regressions

LHS: Dummy for # of months to pay down
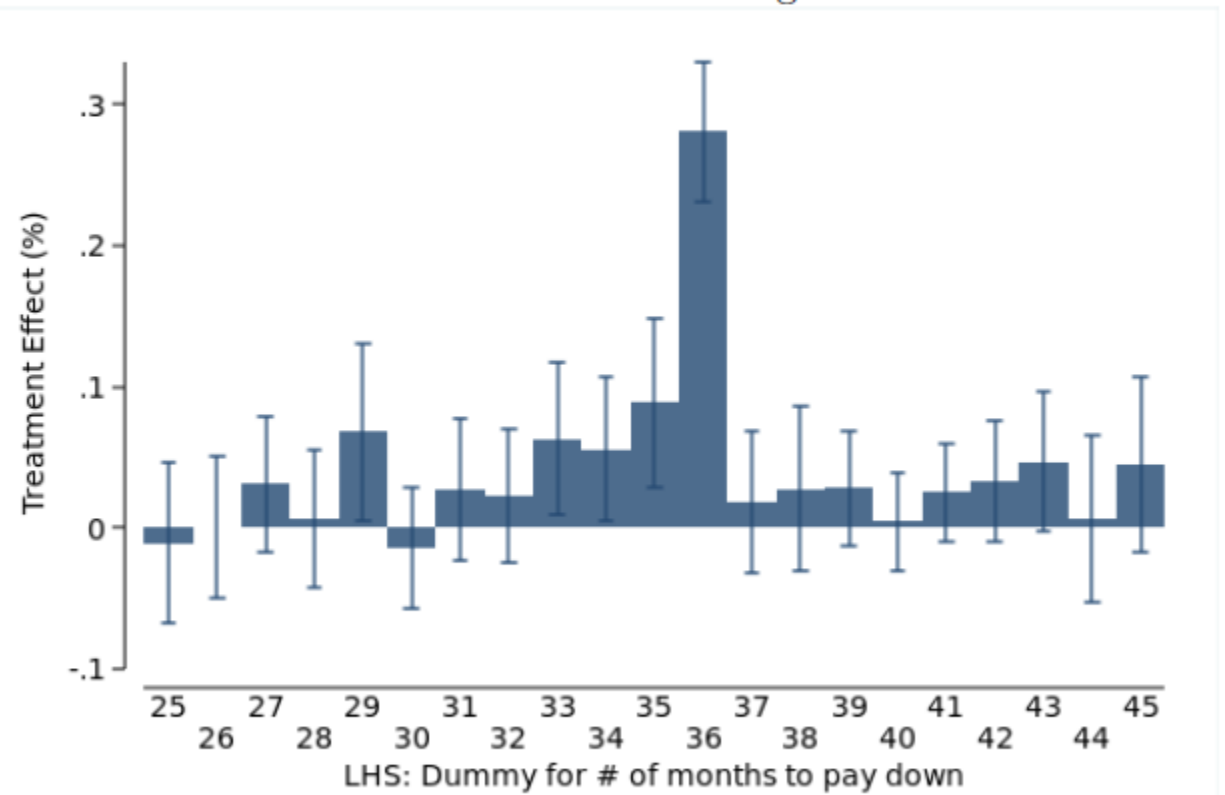
Coefficient   95% Conf Int

Descriptive Statistics

Sample: Fintech Consumers Have Lower Scores and Credit limits

Customers from fintech credit card company

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

Income	$44,363
Vantage at application	664
Enrolled in autopay	27%
Credit limit	$1,839
Retail APR	21%

Auto-payers are More Bimodal
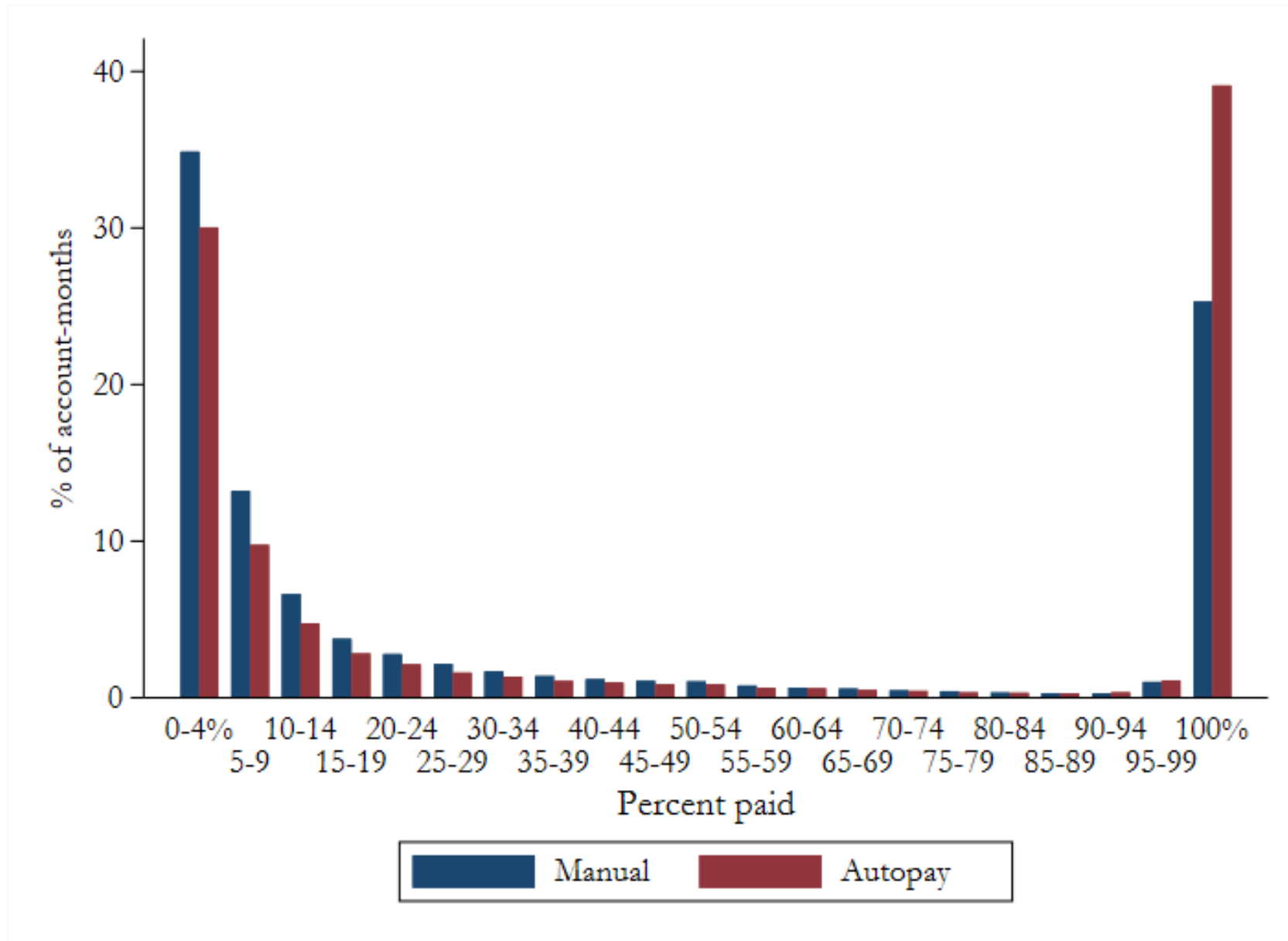
Auto-payers Have Fewer Delinquencies
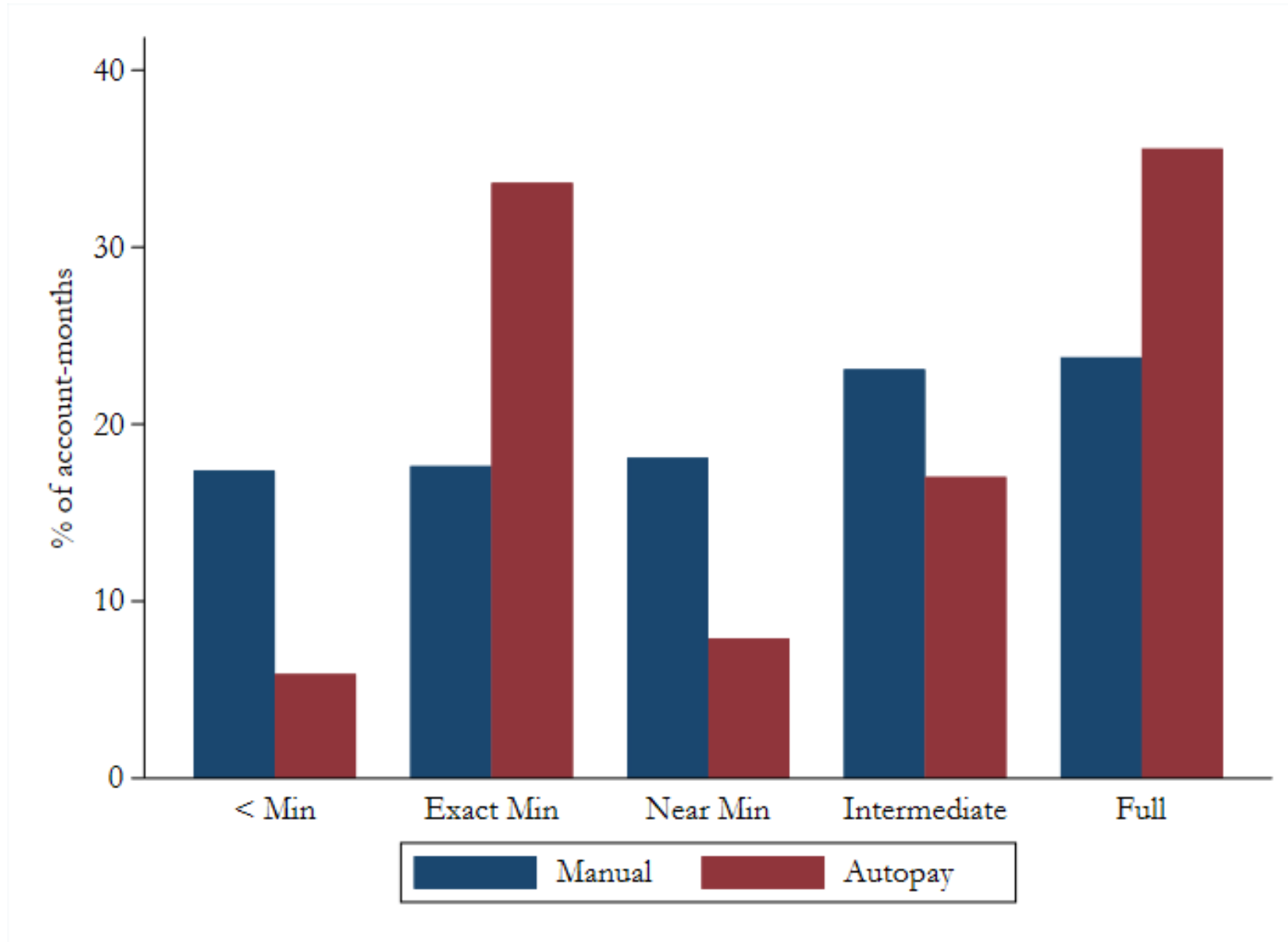
Regression Discontinuity Design:

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
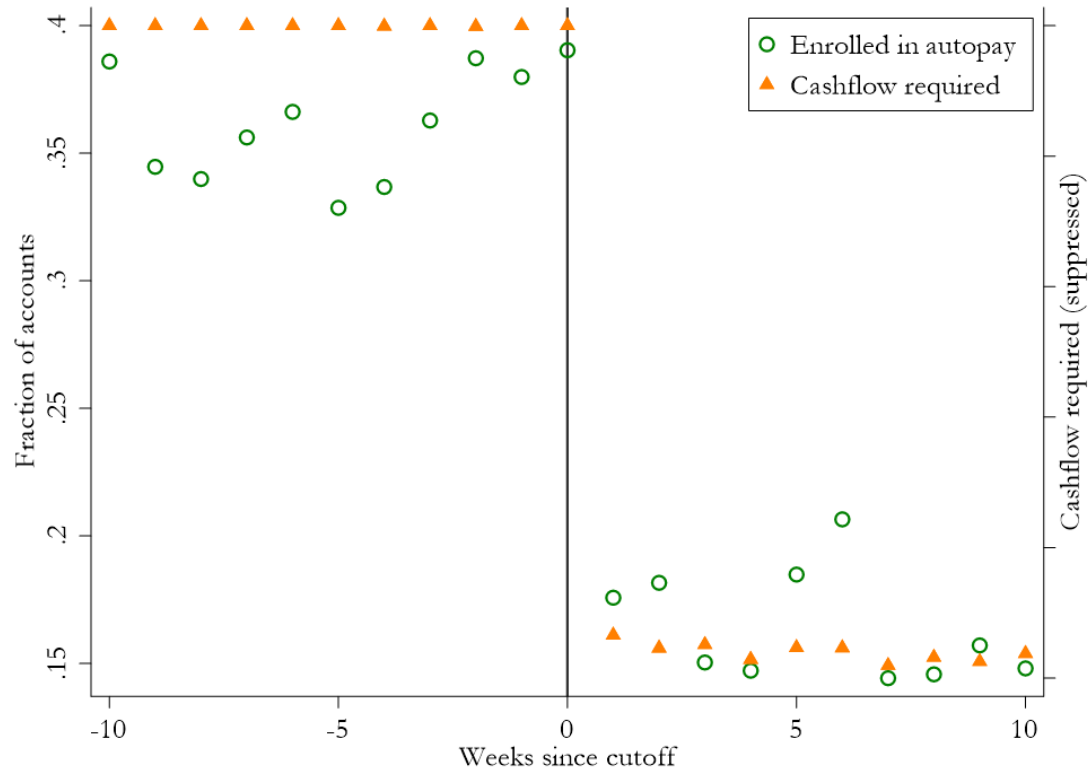
Second Underwriting Change
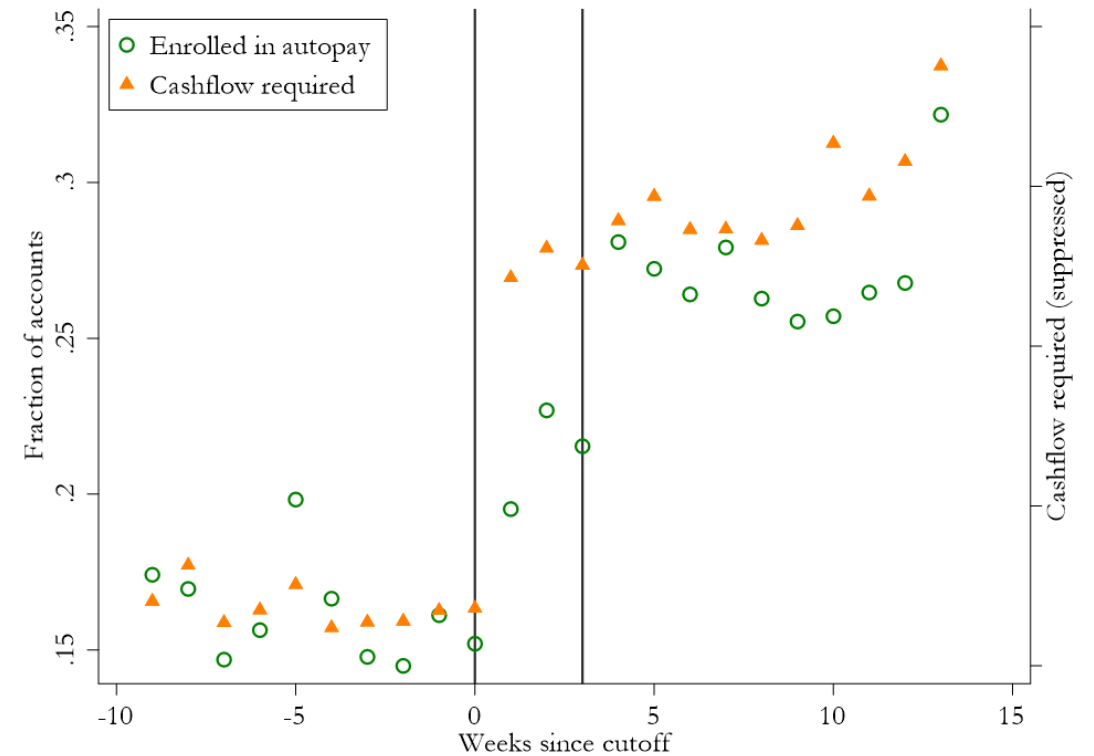
First Stage: Persistence of Autopay

First Underwriting Change
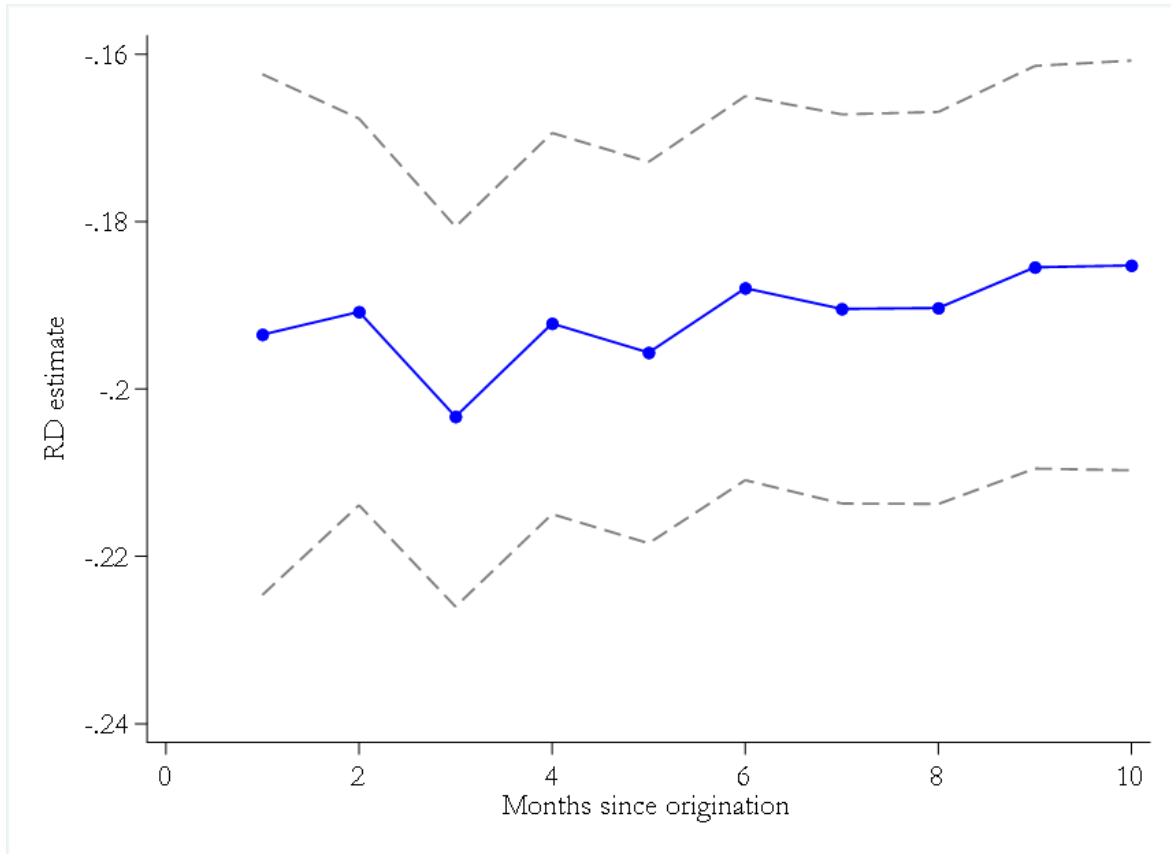
Second Underwriting Change
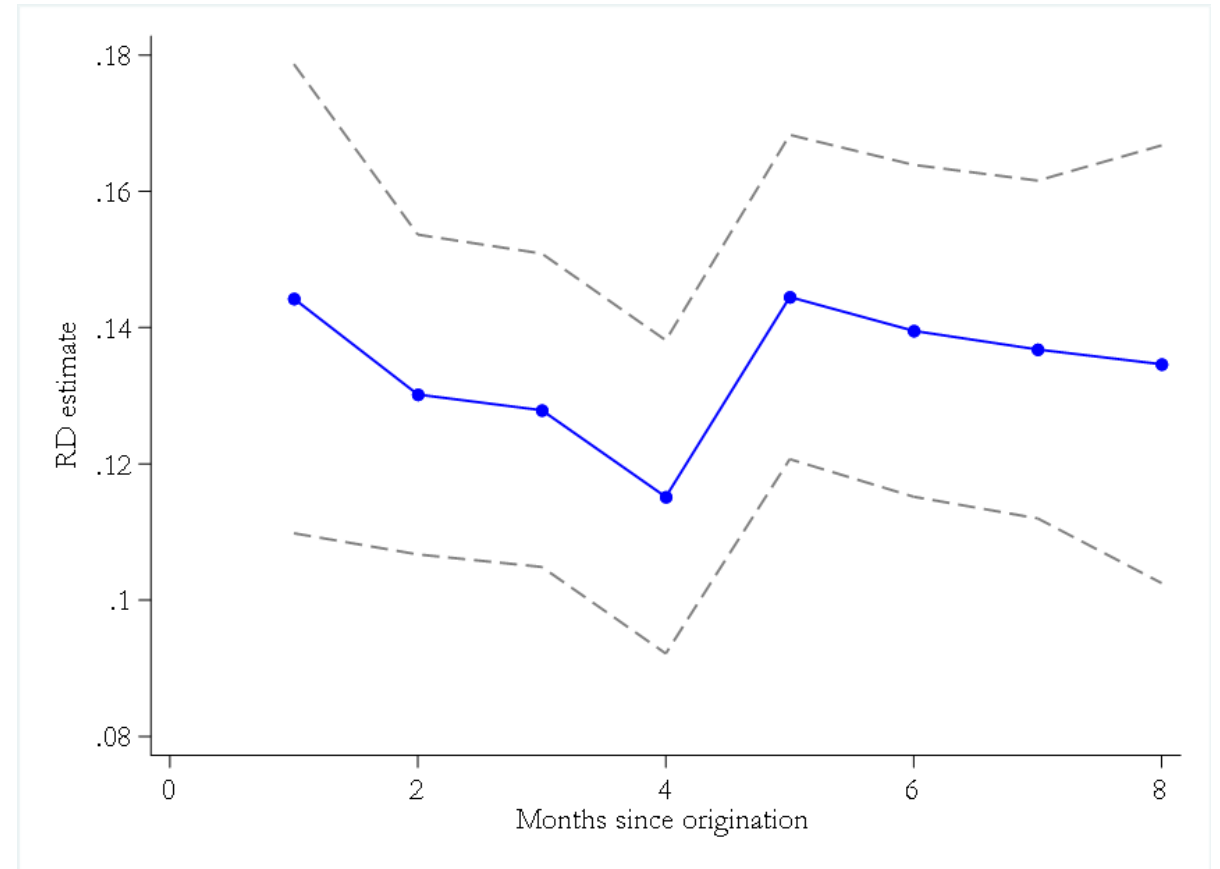
IV: Autopay → Minimum Payments

		Chargeoff	Paid Min	Min to full	Paid Full	Fraction Paid
Linear specification No controls	Mean	10%	28%	38%	25%	38%
First Change	Regression coefficient	- 0.191 (0.011) [0.000]	0.294 (0.018) [0.000]	- 0.229 (0.020) [0.000]	0.110 (0.018) [0.000]	0.119 (0.017) [0.000]
Second Change	Mean	12%	19%	43%	27%	40%
	Regression coefficient	0.064 (0.019) [0.001]	0.273 (0.032) [0.000]	- 0.263 (0.038) [0.000]	- 0.101 (0.036) [0.005]	- 0.087 (0.034) [0.011]

IV: Persistence of Autopay Effects
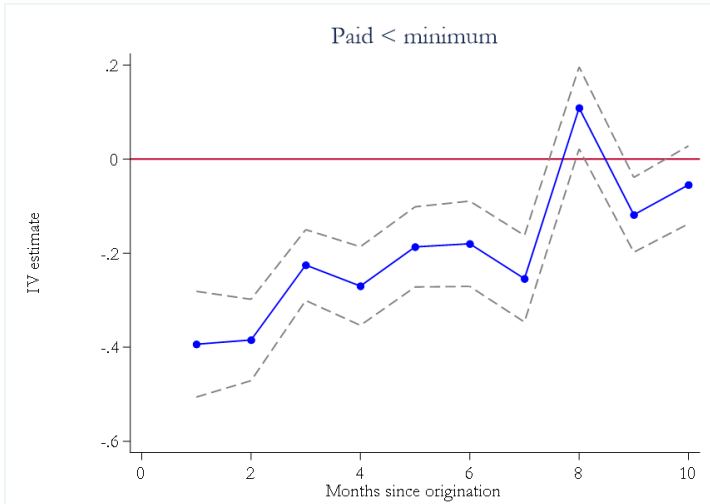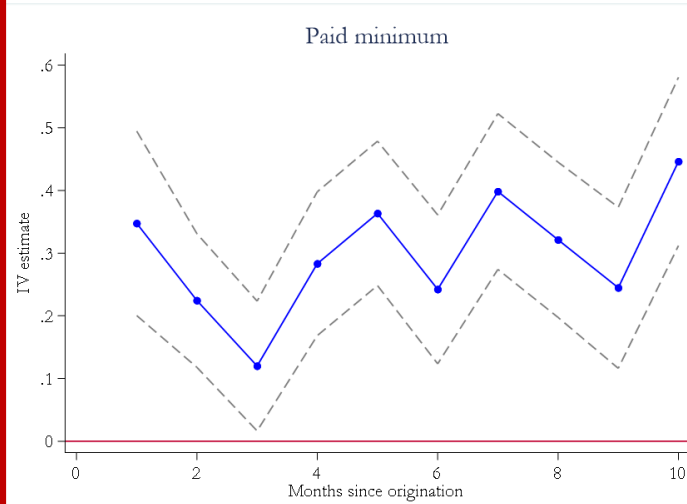
Delinquency   Paid minimum   Paid full

First Change

Second Change

IV: Persistence of Autopay Effects

22
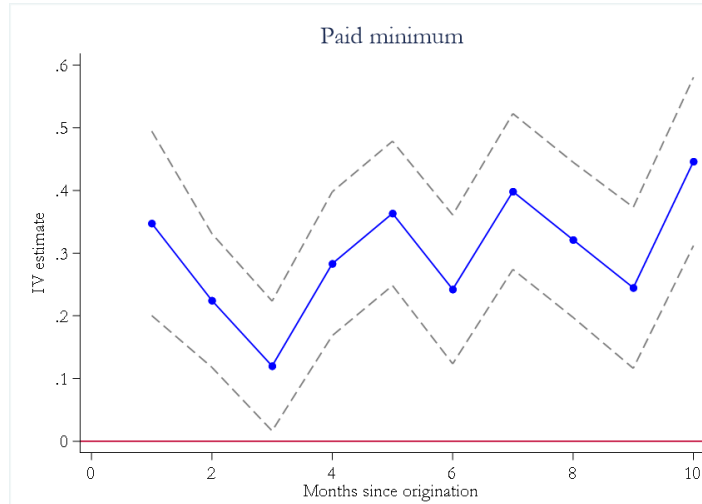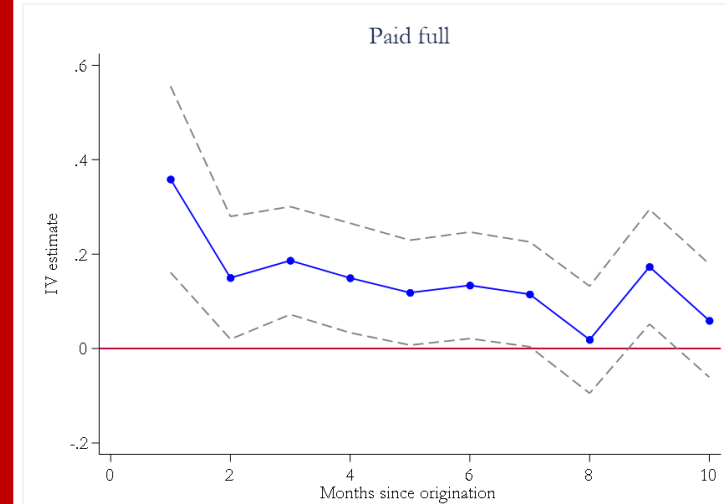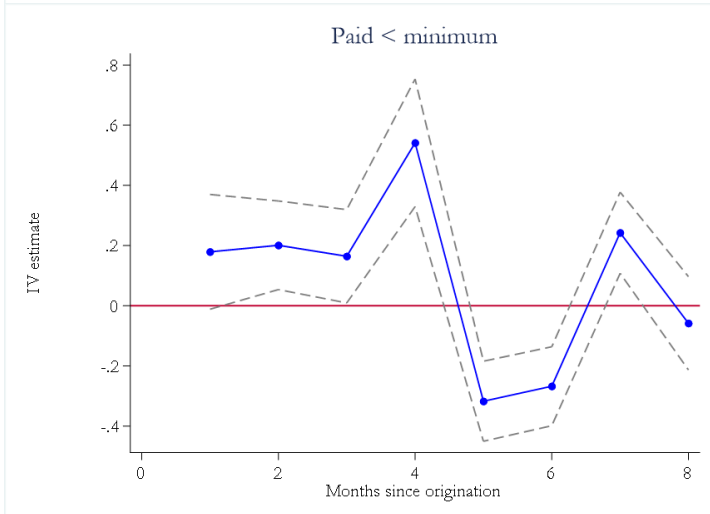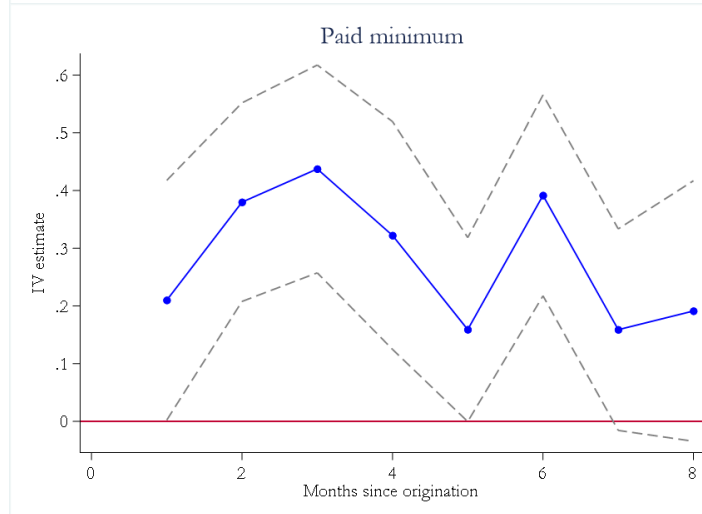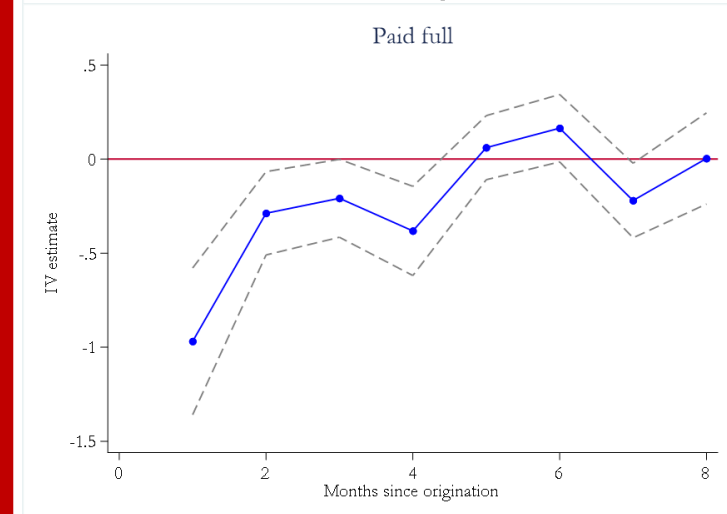
Key Conclusion: Autopay Has Large Effects on Minimum Payments

- 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
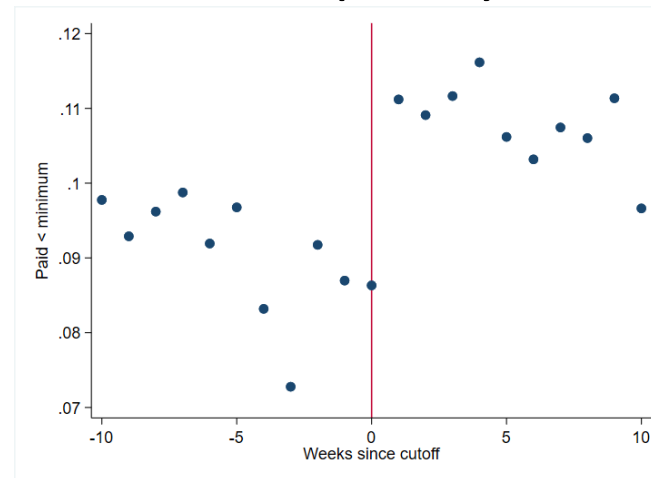
Delinquency
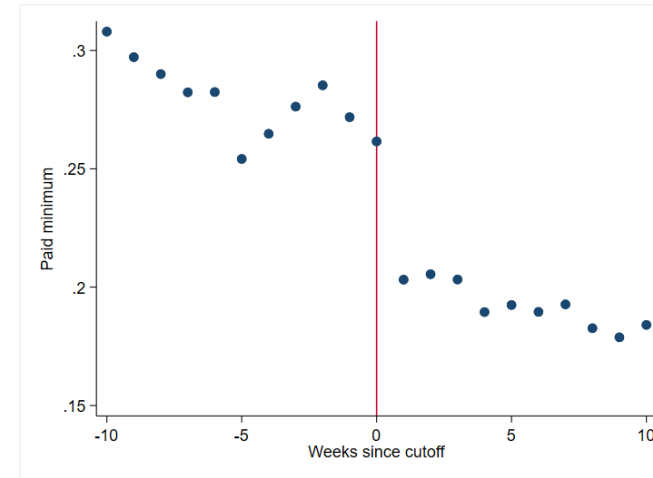
Paid minimum
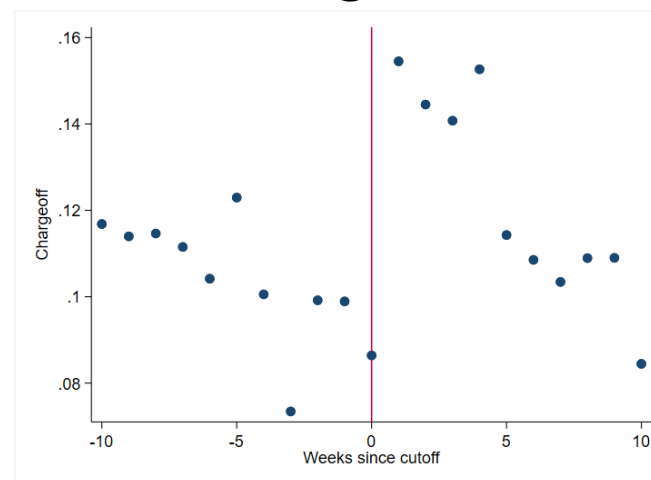
Chargeoff
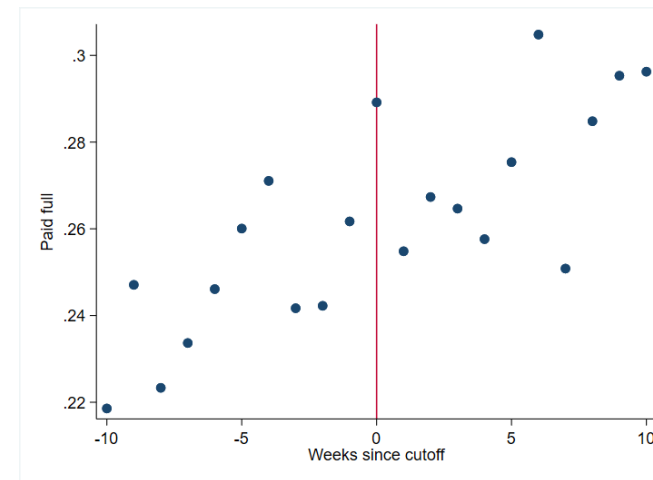
Paid full

Reduced form: Second Underwriting Change
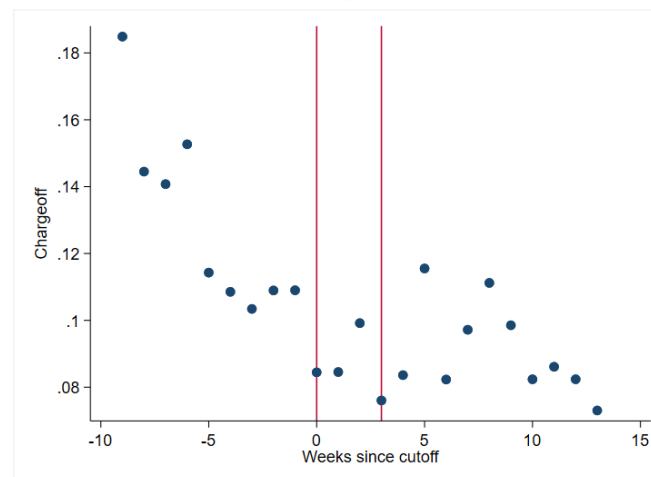
Unconditional binscatters
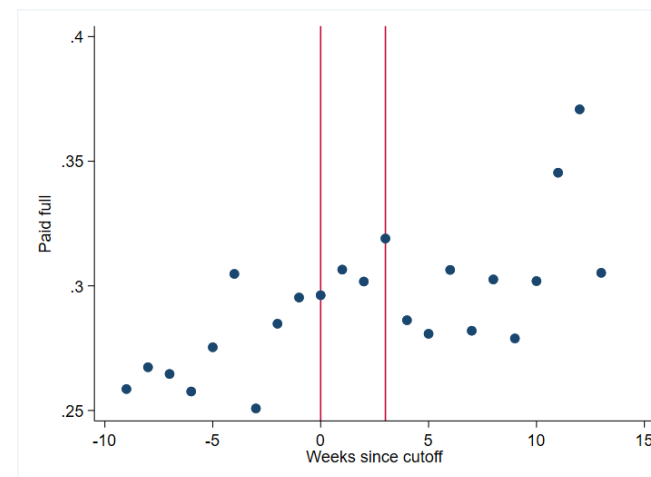

Delinquency
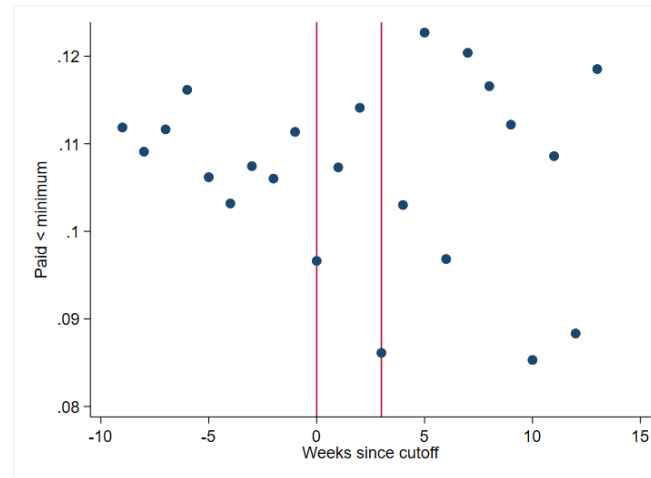
Paid minimum
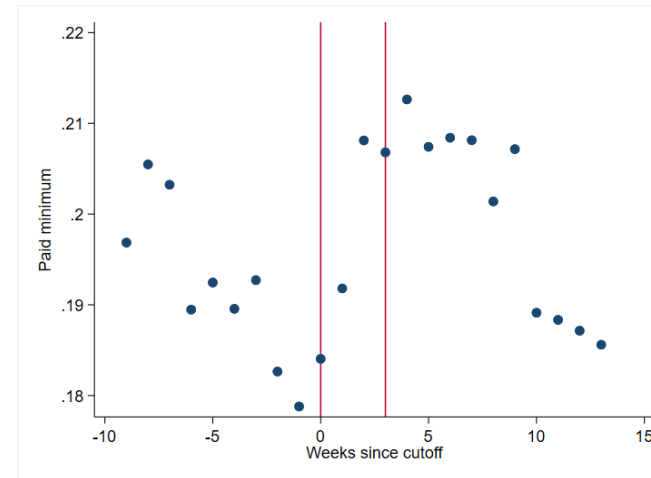
Chargeoff

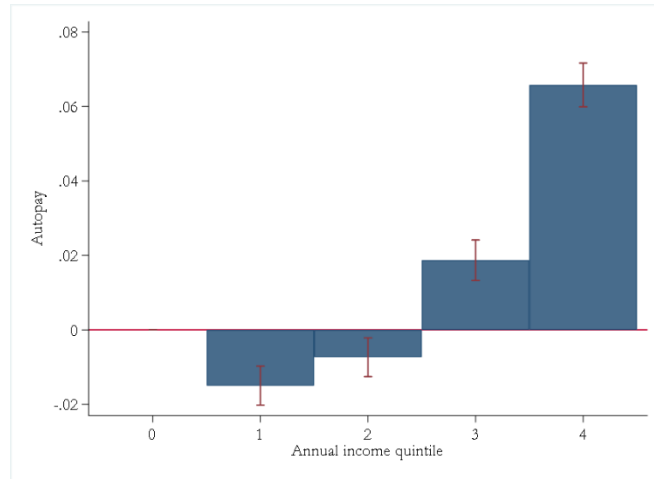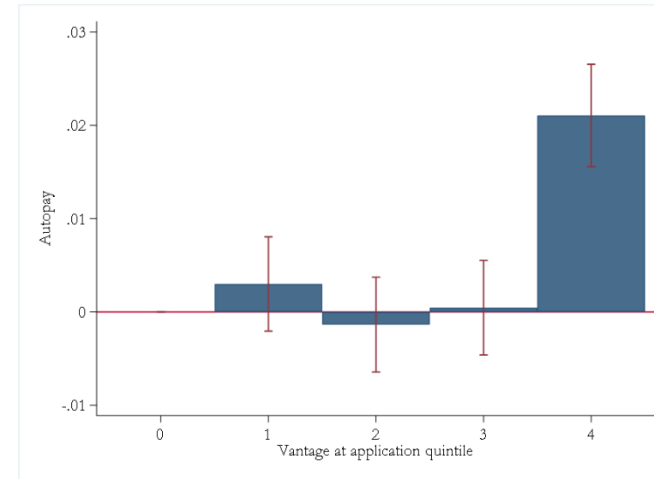Paid full

Control Coefficients: First Underwriting Change

Control coefficients for autopay enrollment (first stage)

Income

Vantage

APR

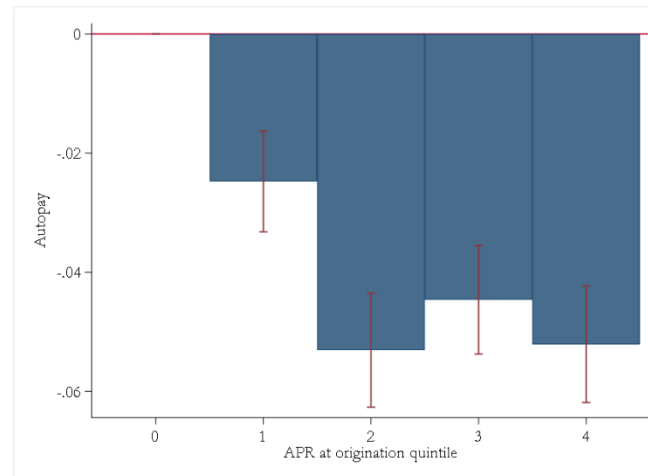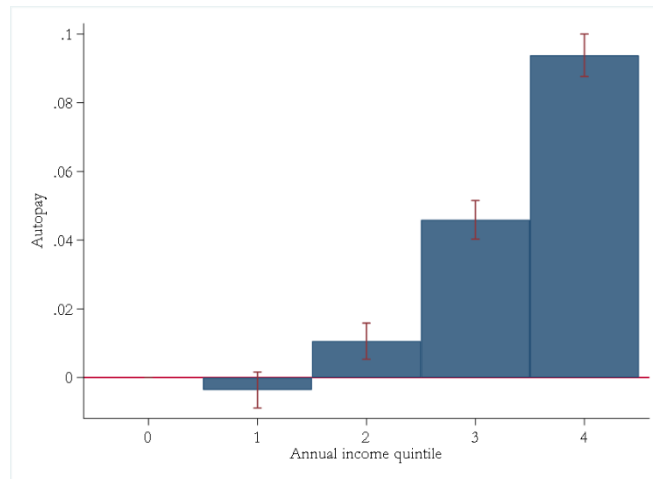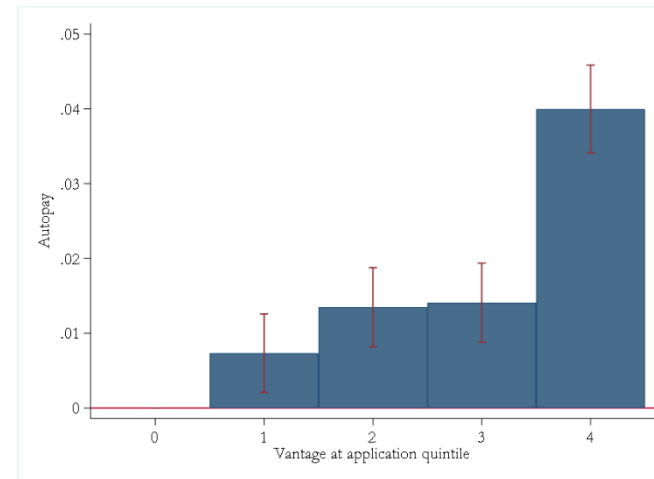# Control Coefficients: Second Underwriting Change

Control coefficients for autopay enrollment (first stage)

Income

Vantage

APR