

THE SEMBLANCE OF SUCCESS IN NUDGING CONSUMERS TO PAY DOWN CREDIT CARD DEBT

2020 #ECONTWITTER VIRTUAL ECONOMICS + FINANCE CONFERENCE

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*NOT NECESSARILY REFLECTING POSITIONS OF THE FINANCIAL CONDUCT AUTHORITY
(FCA), AFM OR CMA.* 

THE SEMBLANCE OF SUCCESS IN NUDGING CONSUMERS TO PAY DOWN CREDIT CARD DEBT

Ex-ante test of potential nudge regulation by UK Financial Conduct Authority (FCA) to reduce persistent credit card debt.

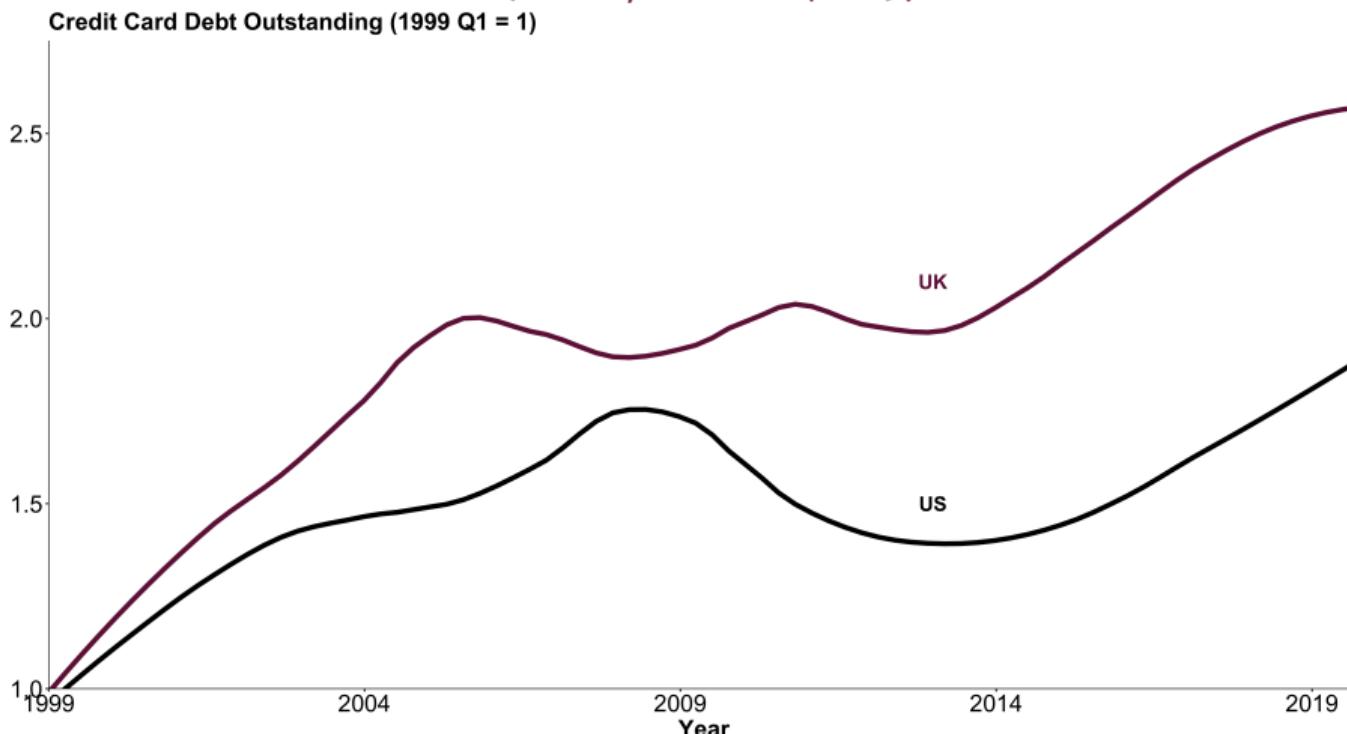
CREDIT CARD DEBT: LARGE, EXPENSIVE

- ❑ \$1 trillion UK + US outstanding credit card debt
- ❑ r: 17% US, 21% UK
- ❑ Much puzzling in credit card behavior

(Zinman, 2014, 2015; Beshears et al., 2018;
Gomes, Haliassos & Ramadorai, Forthcoming)

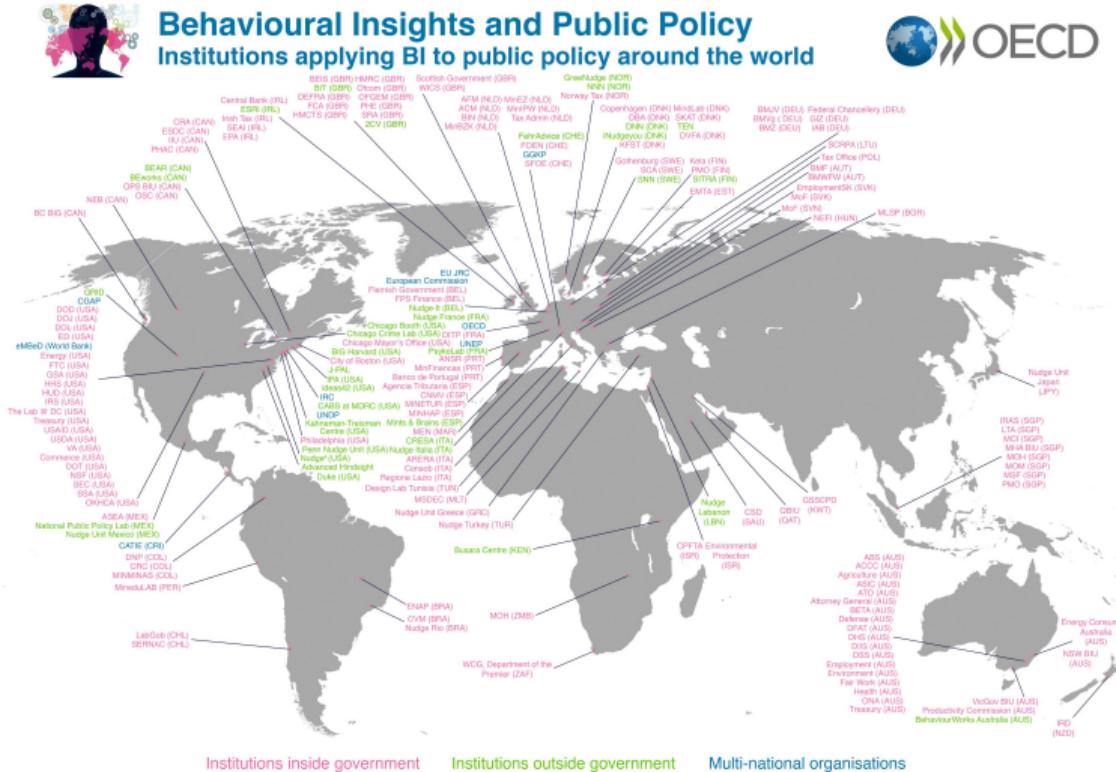
CREDIT CARD DEBT POST-CRISIS: US DELEVERAGED, UK REMAINED

\$1 trillion UK + US outstanding credit card debt
r: 17% US, 21% UK (2019)



Sources: FRBNY, Bank of England (1999 Q1 - 2019 Q4)

202 NUDGE UNITS GLOBALLY



REPEATED MINIMUM PAYMENTS ARE COSTLY

MINIMUM PAYMENT CALCULATION

Minimum payment = max{£5, total interest + fees + 1% balance}

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Example: £1,000 debt (18.9% APR, no further spending)

Payment	Time to Repay Debt (years,months)	Interest Cost
Minimum Payment	18,6	£1,265

FIXING MONTHLY PAYMENTS ABOVE MINIMUM PRODUCES BIG SAVINGS

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Payment	Time to Repay Debt (years,months)	Interest Cost
Minimum Payment	18,6	£1,265
£25	5,1	£509
£50	2,0	£191

AUTOMATIC MINIMUM PAYMENTS

Repeated minimum payers often enrolled in
automatic minimum payments (type of ‘Autopay’/‘Direct Debit’)

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Automatic minimum payments (Sakaguchi et al., 2020)...

-  **‘Good’:** Near-perfect insurance vs. forgetting to pay
 (£12 late fee, interest cost, credit score impact)

AUTOMATIC MINIMUM PAYMENTS

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Automatic minimum payments (Sakaguchi et al., 2020)...

-  **‘Good’:** Near-perfect insurance vs. forgetting to pay
(£12 late fee, interest cost, credit score impact)
-  **‘Bad’:** Inattention to debt
(little debt paydown, non-salient accrual of interest,
effort cost of manual payment)

DESIGN

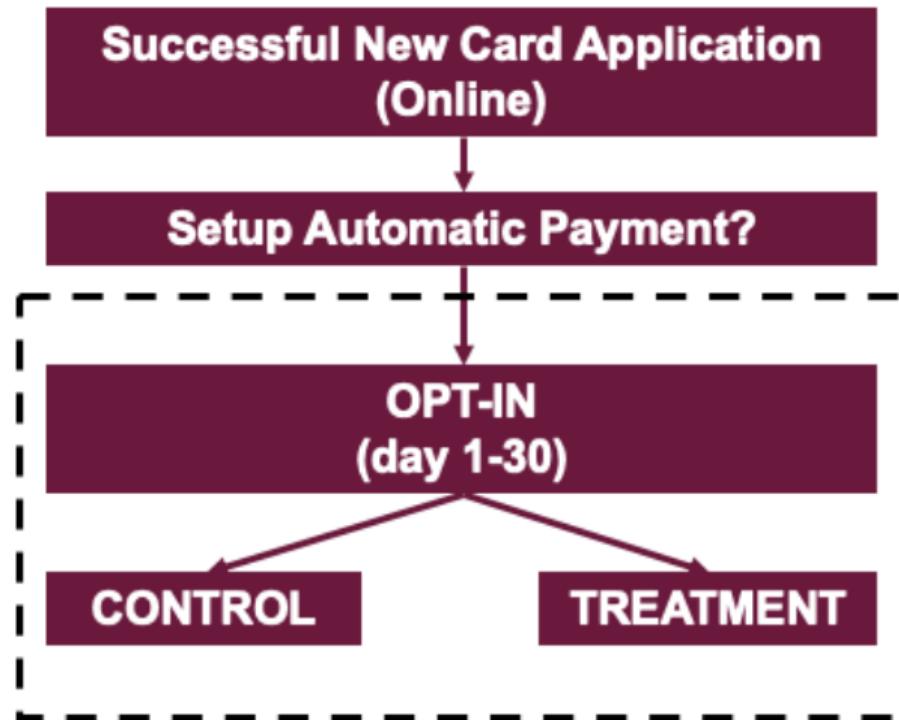
FIELD EXPERIMENT

Pre-registered RCT (outcomes, regressions, significance thresholds)

40.7k newly issued credit cards from large UK lender (February - May 2017)

2nd lender stopped after one week of fieldwork

PREVENTATIVE NUDGE TO NEW CARDS SETTING UP AUTOMATIC PAYMENTS ONLINE (DAY 1-30)



CONTROL: AUTOMATIC PAYMENT OPTIONS WHEN OPEN CARD (OPT-IN)

Automatic minimum, full + fixed payment options (or none)

Pay your card bill

Make a payment

Set up a Direct Debit

To set up a Direct Debit you'll need to be the account holder and be able to authorise payments from the account.

Not the account holder or need joint signatures? Just download the Direct Debit instruction form fill it out and return it to us by post. If your joint account only needs one signature, just complete the form below.

How much would you like to pay each month?

The amount will be reduced by any payments received since your last statement

The minimum

It will take longer and generally cost more to clear your balance this way. If you make extra payments, your direct debit will only collect the difference needed to reach the minimum

Statement amount

You will clear your balance this way. If you make extra payments your direct debit will only reduce the difference to your last statement

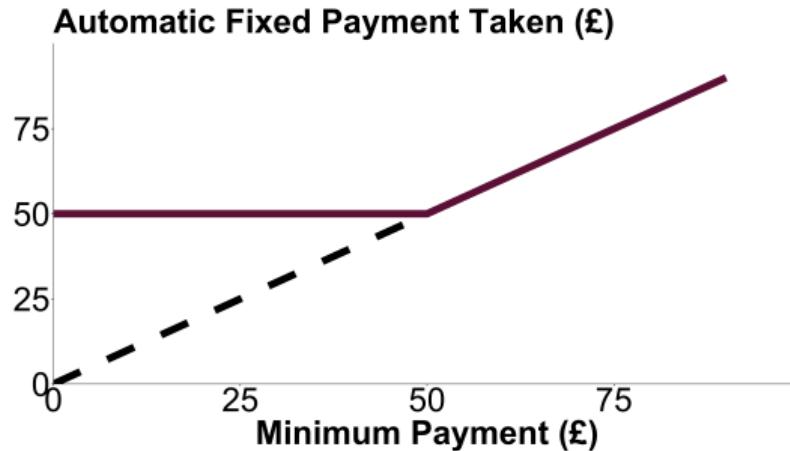
This much

£

We'll collect your fixed amount or the minimum payment due, whichever is the greater. If you make extra payments, your direct debit will still collect the fixed amount or the remaining balance if this is lower

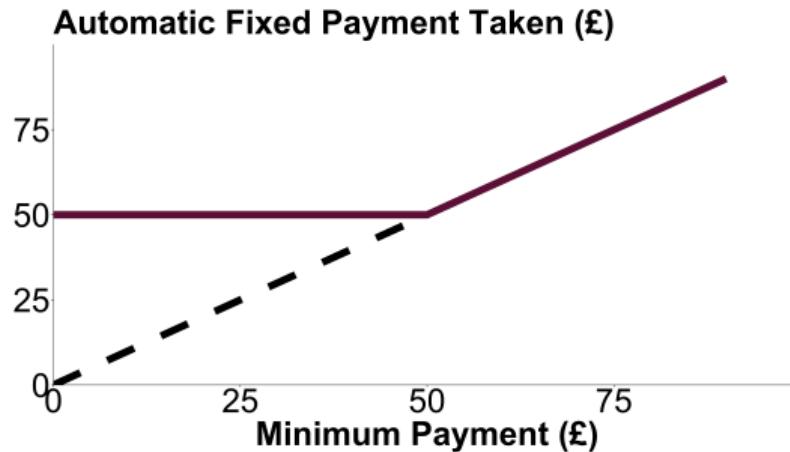
WHAT IS 'AUTOMATIC FIXED PAYMENT' OPTION?

Automatic fixed payment taken = max{fixed £ amount, minimum payment}
E.g. £50 automatic fixed payment



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£5 automatic fixed payment \equiv automatic minimum payment

Why? *Minimum payment = max{£5, total interest + fees + 1% balance}*

TREATMENT: NO EXPLICIT AUTOMATIC MINIMUM PAYMENT OPTION

Automatic full + fixed payment options (or none)

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TREATMENT DESIGNED TO AUTOMATICALLY REDUCE DEBT

Increase automatic fixed payment enrollment

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Increase automatic payments

TREATMENT DESIGNED TO AUTOMATICALLY REDUCE DEBT

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Increase automatic payments



Increase payments above minimum

TREATMENT DESIGNED TO AUTOMATICALLY REDUCE DEBT

Increase automatic fixed payment enrollment



Increase automatic payments



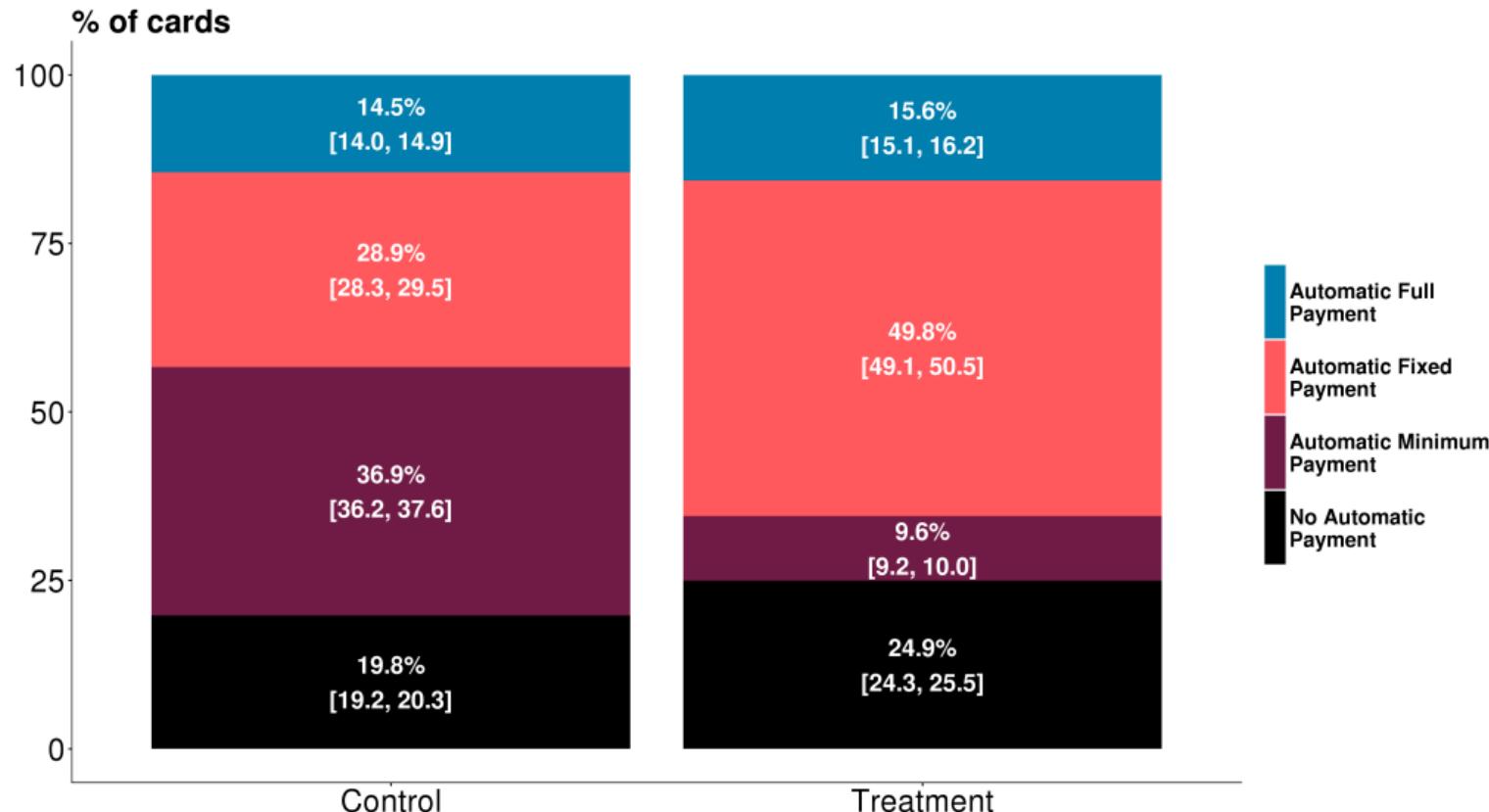
Increase payments above minimum



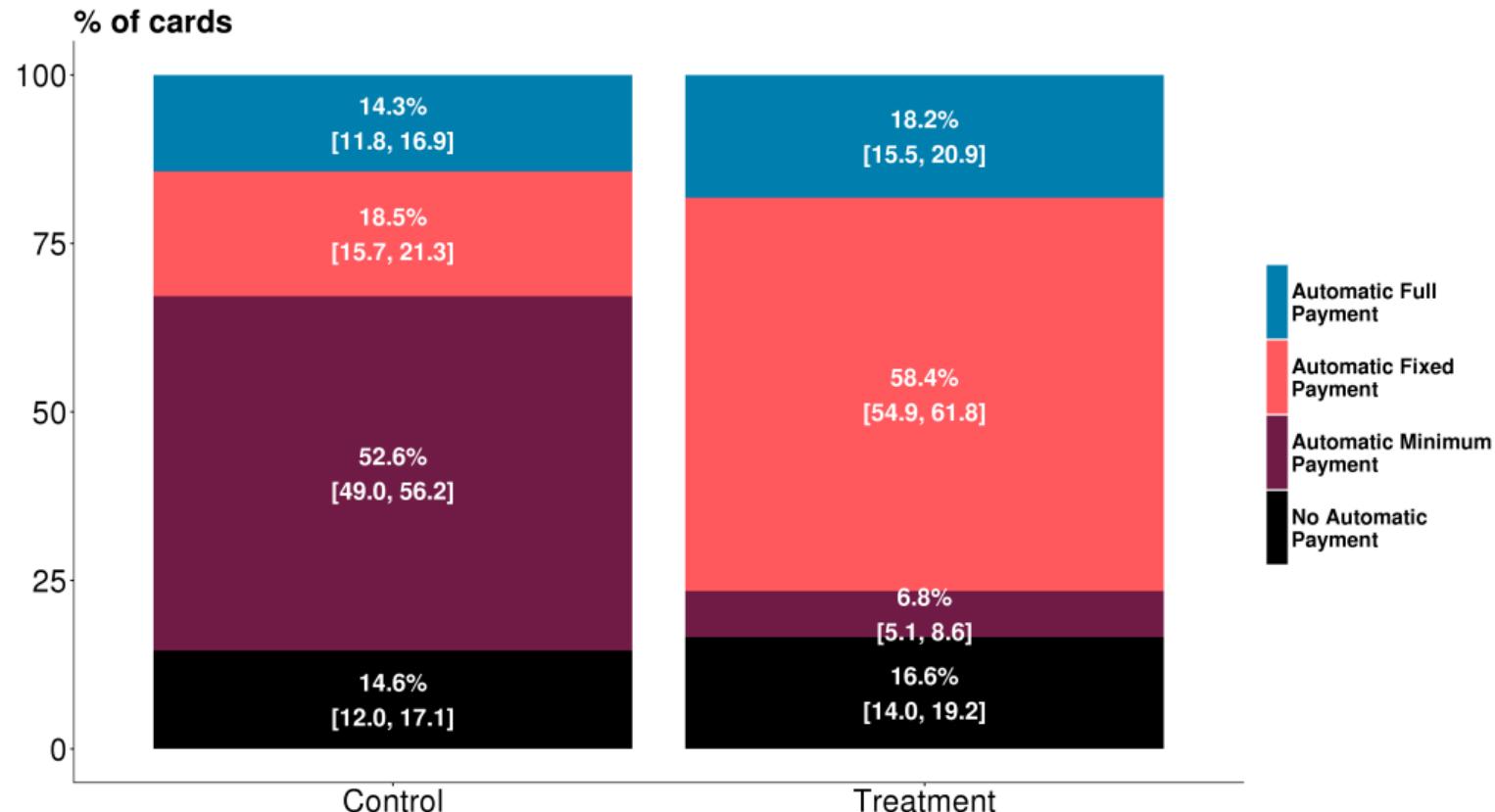
Decrease debt + interest costs

RESULTS

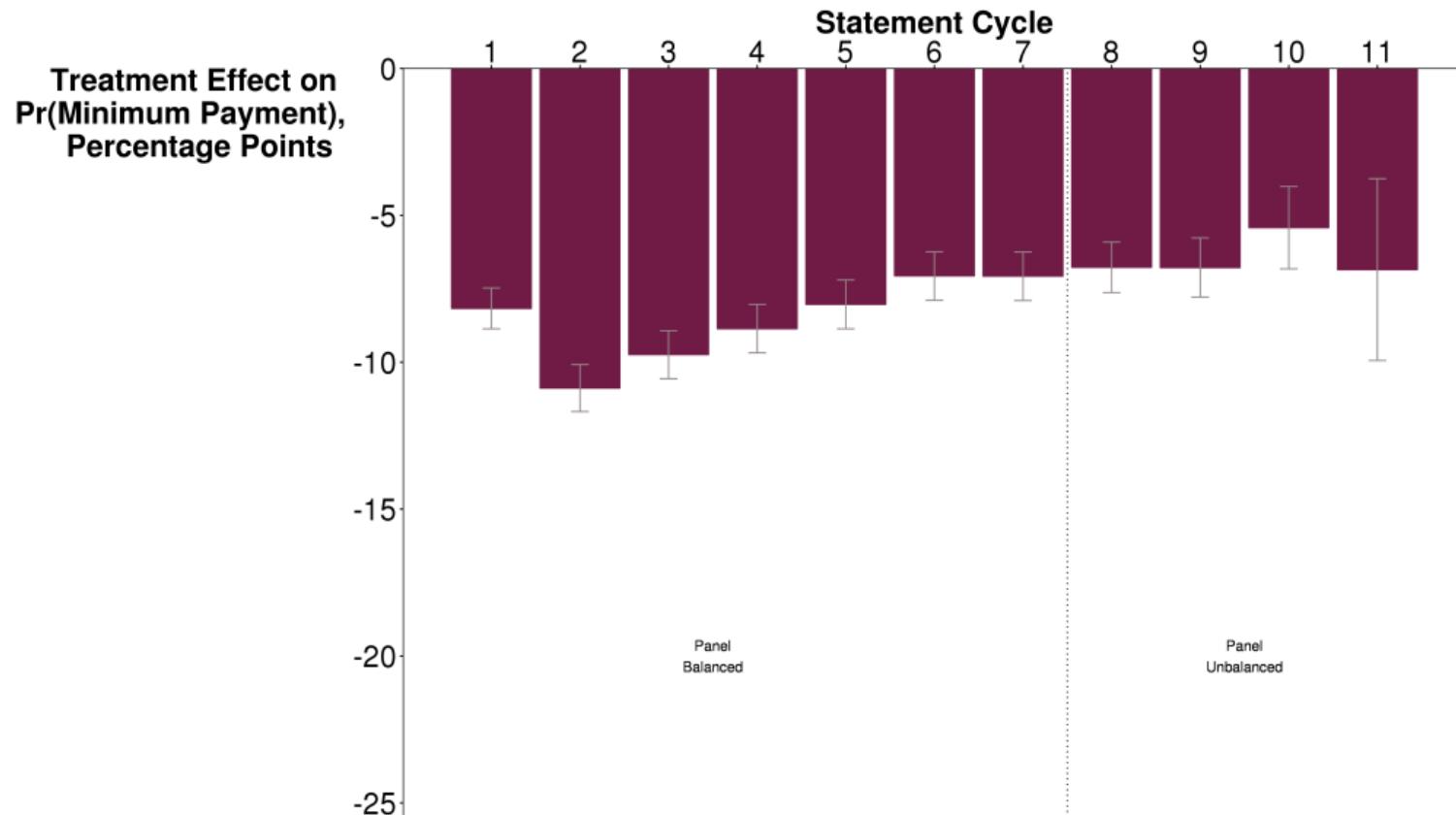
+21PP (+72%) AUTOMATIC FIXED PAYMENT ENROLLMENT (STATEMENT 2)



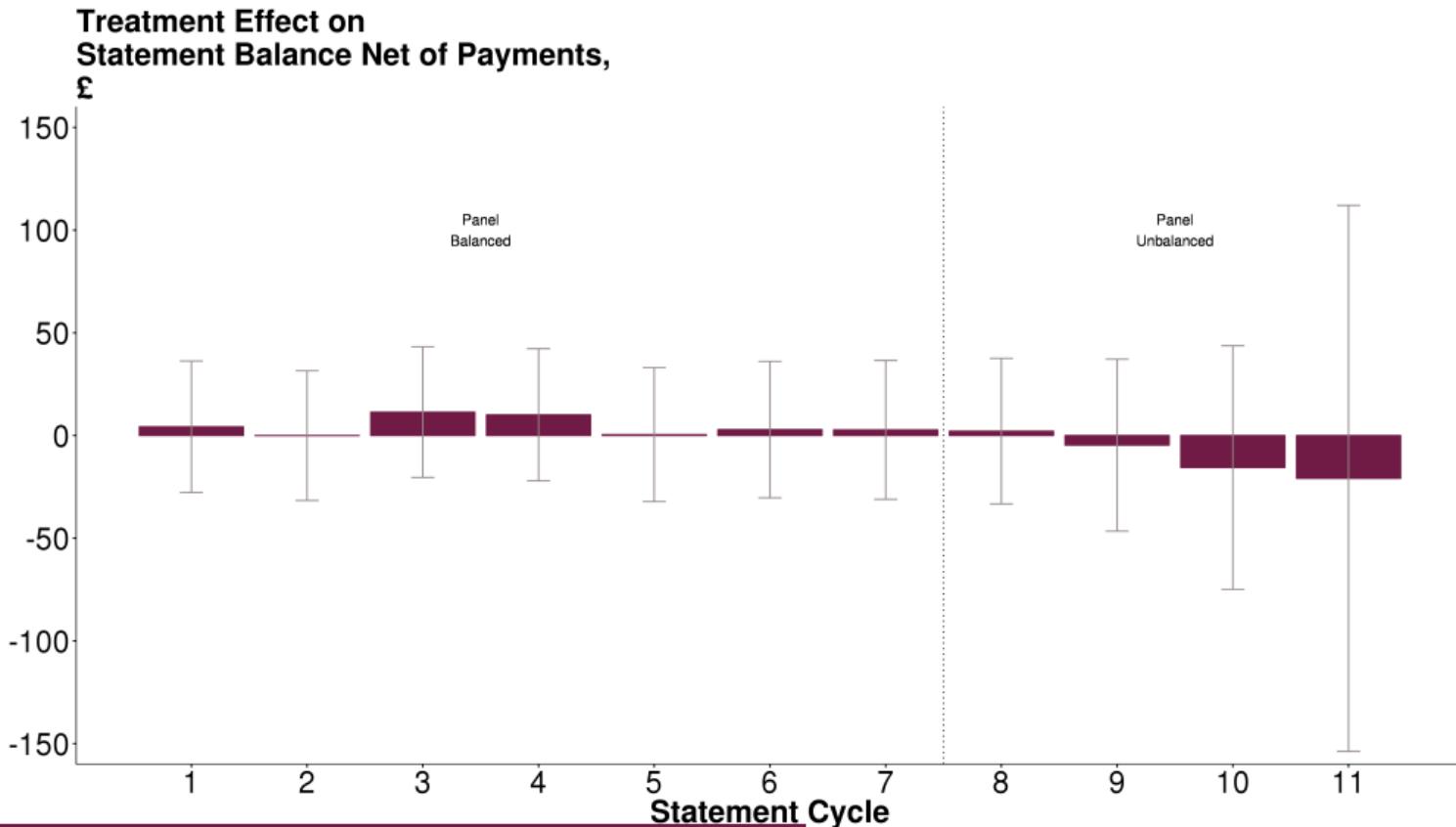
2ND LENDER: +4OPP (+216%) AUTOMATIC FIXED PAYMENT ENROLLMENT



-7PP (-24%) PAYING EXACTLY MINIMUM (AFTER 7 STATEMENTS)



NO CHANGE IN DEBT (AFTER 7 STATEMENTS)



PRECISE ZERO AVERAGE TREATMENT EFFECTS ON OTHER PRIMARY OUTCOMES (AFTER 7 STATEMENTS)

Outcome	Estimate (S.E.)
Any minimum payment	-0.0707*** (0.0042)
Any full payment	0.0044 (0.0037)
Any payment less than minimum payment	0.0038* (0.0019)
Statement balance net of payments (% statement balance)	-0.0055 (0.0035)
Costs (% statement balance)	-0.0003 (0.0006)
Transactions (% statement balance)	0.0027 (0.0031)
CRA share of credit cards only paying minimum	-0.0264*** (0.0027)
CRA share of credit cards making full payment	0.0013 (0.0033)
CRA share of credit cards missing payment	-0.0001 (0.0013)
CRA total credit card statement balances net of payments (% statement balance)	-0.0056 (0.0031)

WHY NO DEBT REDUCTION?

WHY NO DEBT REDUCTION?

SLACK: #4-NUDGING-CREDIT-REPAYMENT

3 OFFSETTING CONSUMER RESPONSES

1. Binding automatic fixed payments

Automatic fixed payment taken = max{fixed £ amount, minimum payment}



+17 pp automatic fixed payment enrollment

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but only...



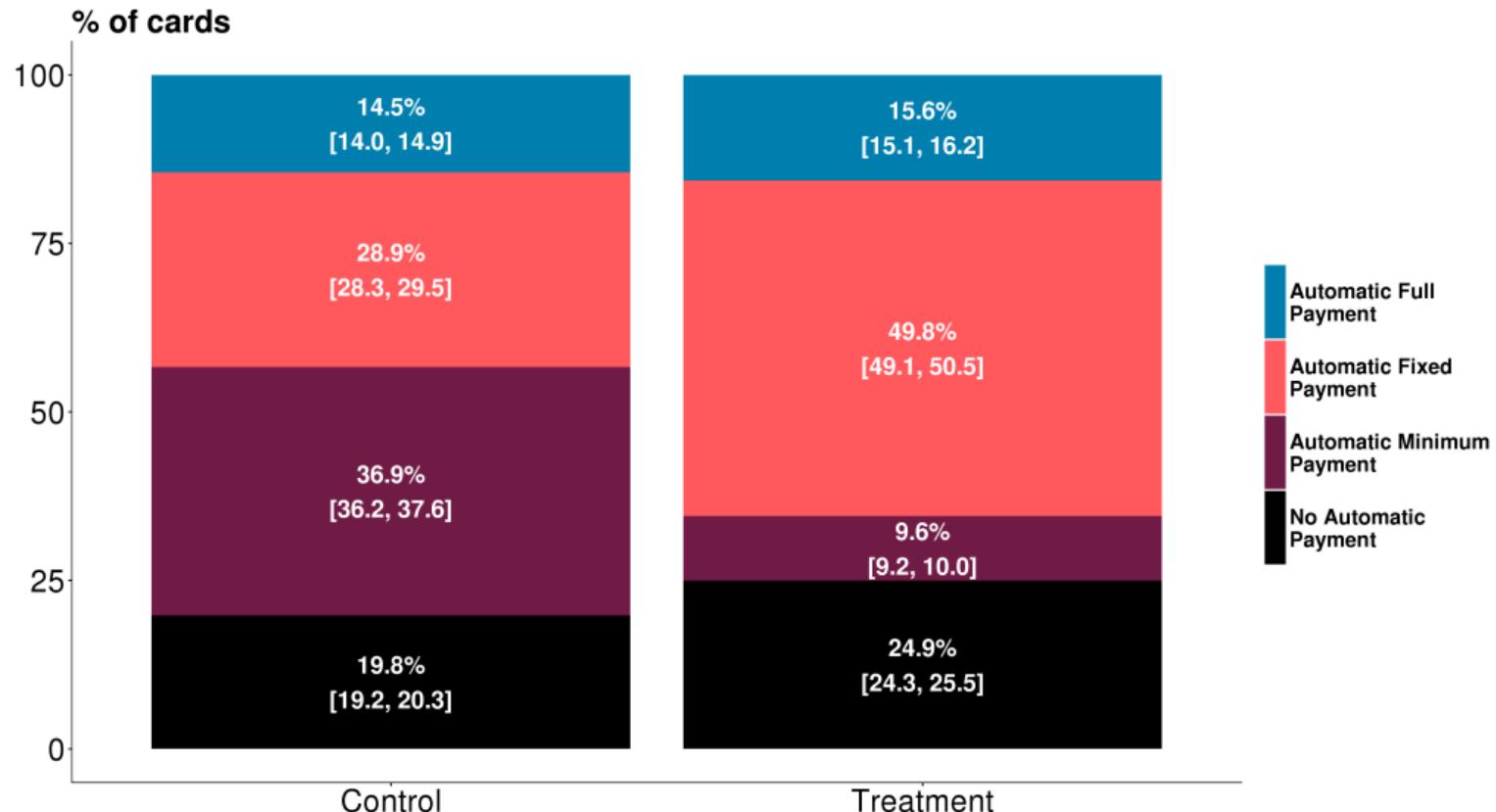
+8.7 pp where fixed payment not binding at minimum
(after 7 statements)

3 OFFSETTING CONSUMER RESPONSES

1. Binding automatic fixed payments

2. Drop-Out: Automatic payment enrollment ↓

DECREASE IN ANY AUTOMATIC PAYMENT ENROLLMENT (STATEMENT 2)



3 OFFSETTING CONSUMER RESPONSES

1. Binding automatic fixed payments

2. Drop-Out: Automatic payment enrollment ↓ (statement 7)



-4.3 pp any automatic payment enrollment

3 OFFSETTING CONSUMER RESPONSES

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 +0.4 pp missing (forgetting) 1+ payment

3 OFFSETTING CONSUMER RESPONSES

1. Binding automatic fixed payments

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 **-4.3 pp** any automatic payment enrollment

 **+0.4 pp** missing (forgetting) 1+ payment

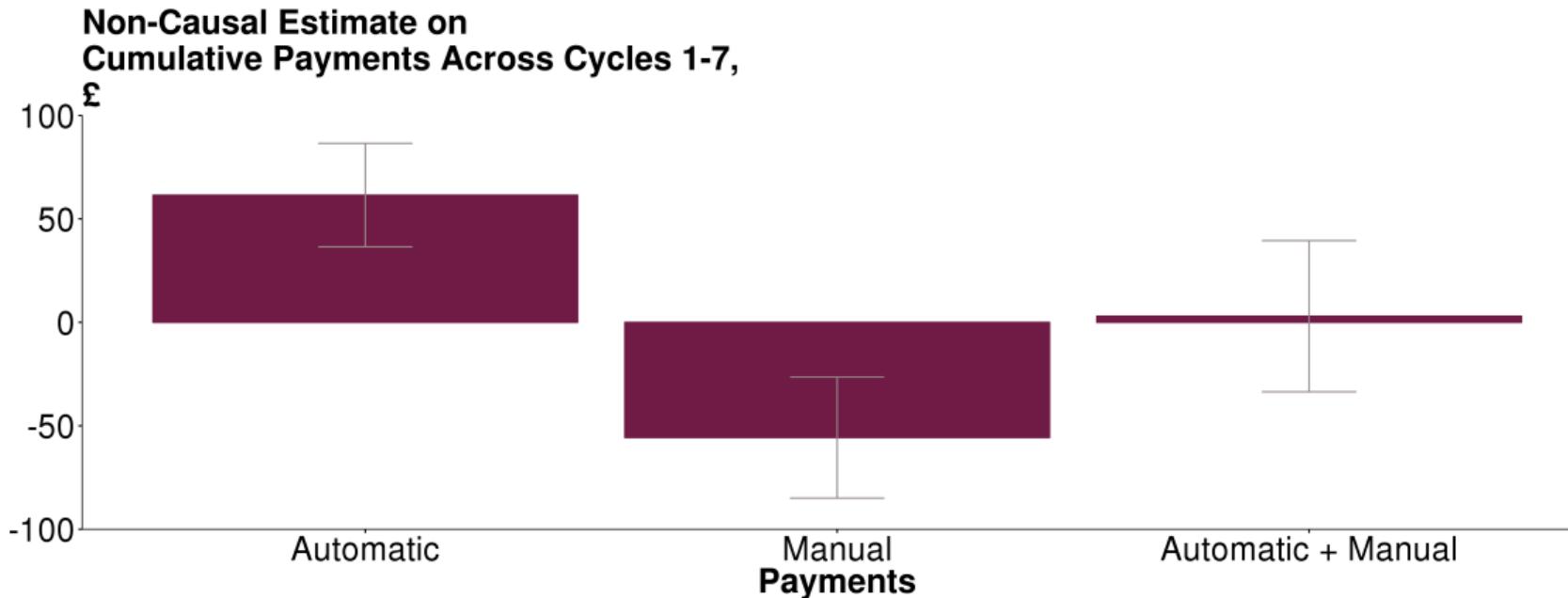
 **ZERO** missing 2+ or 3+ payments

3 OFFSETTING CONSUMER RESPONSES

1. Binding automatic fixed payments
2. Drop-Out: Automatic payment enrollment ↓
3. Crowd-Out: Manual payments ↓

DECOMPOSING FOR SUBSET **WITH** ANY TYPE OF AUTOMATIC PAYMENTS (ENDOGENOUS, NON-CAUSAL ESTIMATE)

Automatic payments increase, manual payments decrease, zero net effect



ADDITIONAL MANUAL PAYMENTS INFREQUENT BUT LARGE

Of those with automatic payments set up...

..Manual payments are...

INFREQUENT: 8.5% make a manual payment

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Of those with automatic payments set up...

..Manual payments are...

INFREQUENT: 8.5% make a manual payment

LARGE: 40% of total (automatic+manual) payment value

	Automatic Payment	Manual Payment
Mean Payment Value	£110	£440
Median Payment Value	£50	£120

Note: Mean, median conditional on positive payment and rounded to nearest £10.

SEMBLANCE OF SUCCESS

Large proximate effects

↑ enrollment

↓ paying minimum

No distal effects on debt

offsetting consumer responses

(binding, drop-out, crowd-out).

3 TAKEAWAYS: REGULATION, NUDGES + CREDIT CARDS

I. REGULATION IS HARD

- ❑ Before launching we did...

literature review

data analysis

qualitative testing

feedback from regulators

feedback all UK lenders

feedback from all UK consumer organizations

- ❑ Sometimes evidence-based policy to not make policy

- ❑ Success for regulation

II. CONSIDER OFFSETTING EFFECTS OF NUDGES

- ❑ Offsetting effects can reduce effectiveness of nudges
- ❑ Longer-term distal outcomes inform welfare not just proximate choices
(Laibson, 2020)
- ❑ Nudges less effective than previously thought but cost-effective
(Jachimowicz et al., 2019; DellaVigna & Linos, 2020)
- ❑ Hard paternalism instead? (Loewenstein & Chater, 2017)

III. LEARNING ABOUT CREDIT CARD REPAYMENT BEHAVIOR

Less inert than 1st appeared (economic / psychological constraints bind)

Manual payments important.

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Models to explain semblance of success...

'Rational inattention' (Sims, 2003)

- Intend to make manual payment
- Arbitrary initial automatic payment choice
- Adjust manual payment

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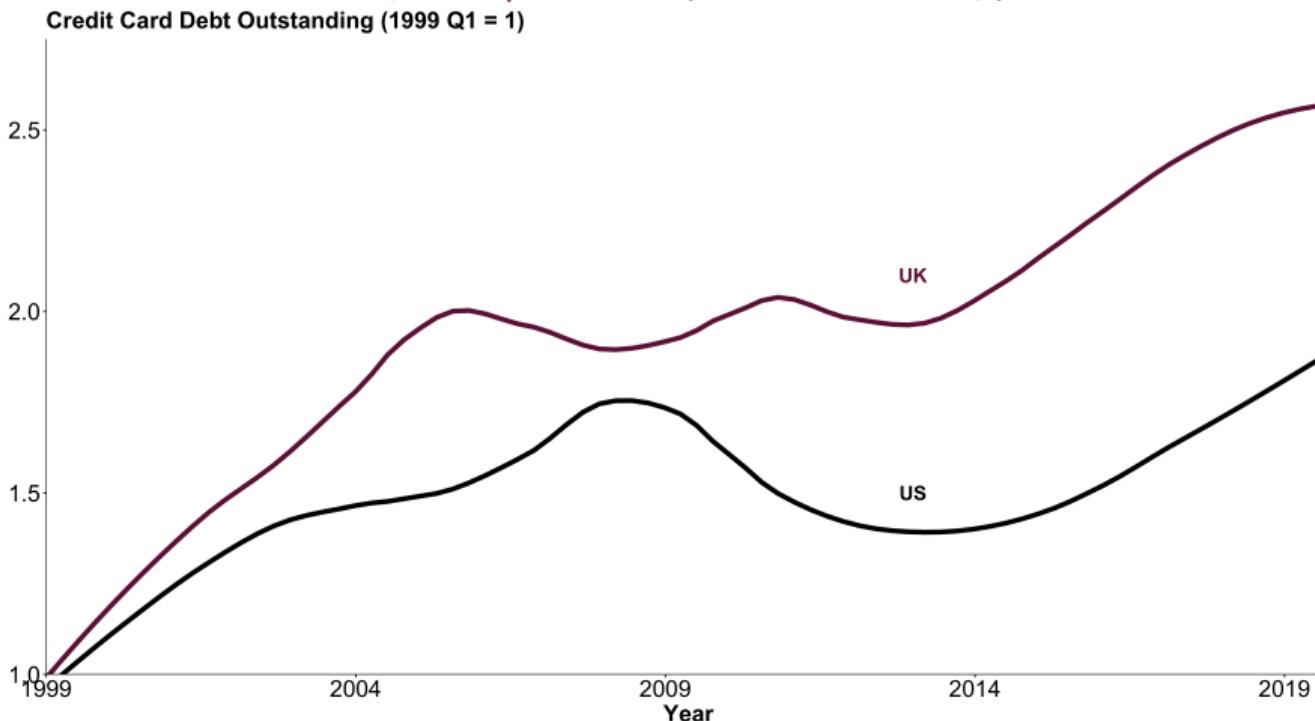
- ❑ Intend to make manual payment
- ❑ Arbitrary initial automatic payment choice
- ❑ Adjust manual payment

'Behavioral S-s' (Bertola & Caballero, 1990)

- ❑ Explicit automatic minimum payment a focal point
- ❑ Not worth cost of adjusting initial choice
- ❑ Adjust manual payment

A NEW WORLD SINCE COVID-19, THE SAME OLD CREDIT CARD DEBT

\$1 trillion UK + US outstanding credit card debt
r: 17% US, 21% UK (December 2019)



THANK YOU #ECONTWITTER!

 @gk_ben

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DISCUSSION

DISCUSSION SLIDES

Summary	Any autopay
Regression	Full autopay
Debt (%)	Min autopay
Pooled	Fix autopay
Secondary	Fix > min autopay
Decomposition	Auto repay
Checks	Manual repay
Means	All repay
L2 checks	Arrears
Bimodal	Anchoring
Disclosure	Time to pay
Puzzles	Nudges



► SUMMARY STATISTICS

Outcome	Mean
Age (years)	36.46
Female (% cards)	46.06
Credit Limit (£)	4312.49
Credit Score (0-100)	65.26
Purchases Rate (%)	22.85
Balance Transfer (% cards)	29.00
Any Automatic Payment Set-up (% cards)	78.33
Any Automatic Full Payment Set-up (% cards)	13.09
Any Automatic Fixed Payment Set-up (% cards)	29.77
Any Automatic Minimum Payment Set-up (% cards)	35.47
Credit Card Statement Balance (£)	2164.49
Credit Card Statement Balance Net of Payments (£)	1962.52
Full Payment (% cards)	23.97
Between Full and Min Payment (% cards)	42.22
Minimum Payment (% cards)	30.12
Missed Payment (% cards)	3.69
Number of Full Payments Across Cycles 1-7	1.90
Number of Minimum Payments Across Cycles 1-7	2.04
Full Payments For 6+ Cycles (% cards)	18.05
Minimum Payments For 6+ Cycles (% cards)	19.18
Credit Card Statement Balance Net of Payments (% Statement Balance)	69.36
Payments Across Cycles 1-7 (£)	1277.27
Purchases Across Cycles 1-7 (£)	350.92
Costs Across Cycles 1-7 (£)	76.02
Interest Across Cycles 1-7 (£)	19.77
Fees Across Cycles 1-7 (£)	56.26
Total Credit Card Statement Balances (£)	2364.92
Total Credit Card Statement Balances Net of Payments (£)	2001.35

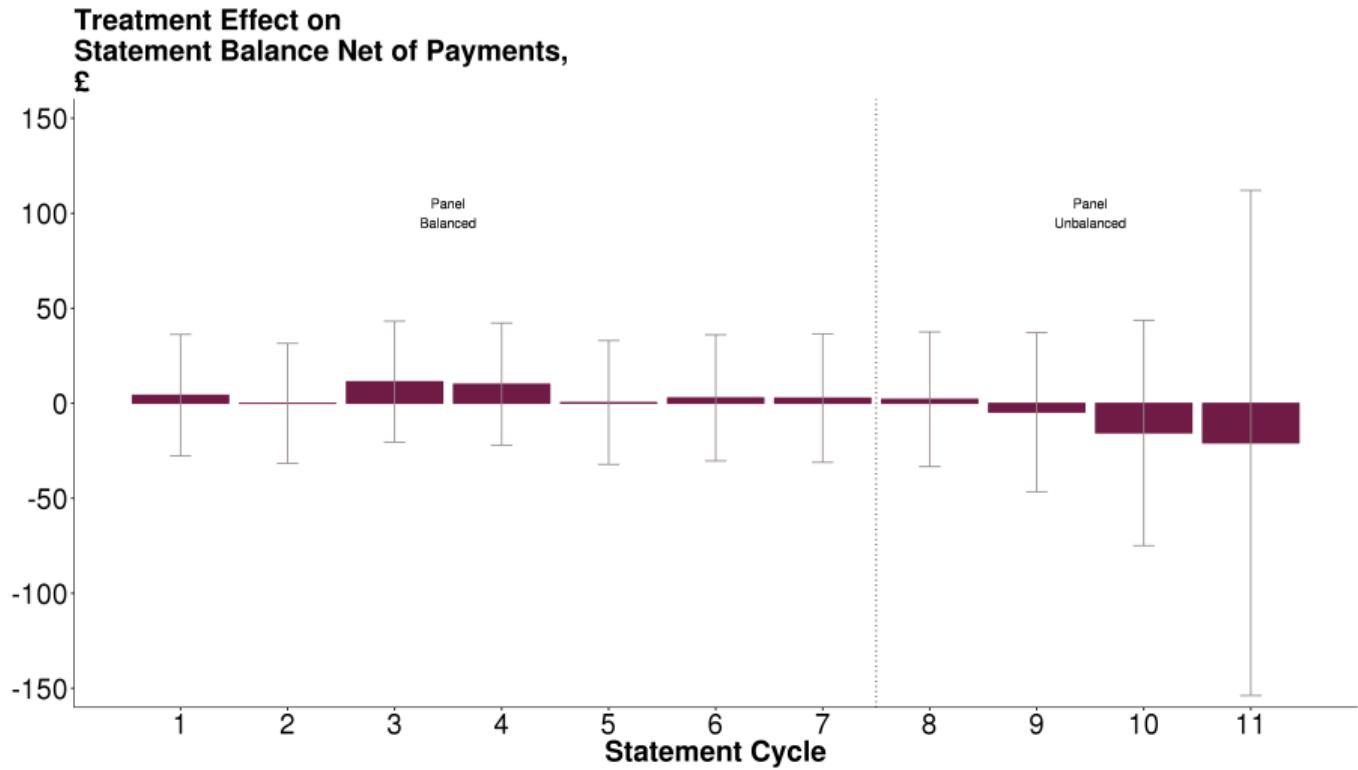
OLS REGRESSION SPECIFICATION

$$y_{i,t} = \alpha + \sum_{k=1}^K \beta_k \text{CONTROLS}_{k,i} + \sum_{v=2}^V \theta_v \text{MONTH}_v + \delta_1 \text{TREATMENT}_i + \sum_{t=2}^{11} \left(\gamma_t \text{CYCLE}_t + \delta_t \text{TREATMENT}_i * \text{CYCLE}_t \right) + \varepsilon_{i,t}$$

Controls (at time of card origination / month prior) Gender, age (polynomial), income, credit score, DTI, mortgage, credit card limit, APR, subprime ccards, promotional rate, balance transfer, open date, statement day, second cardholder.

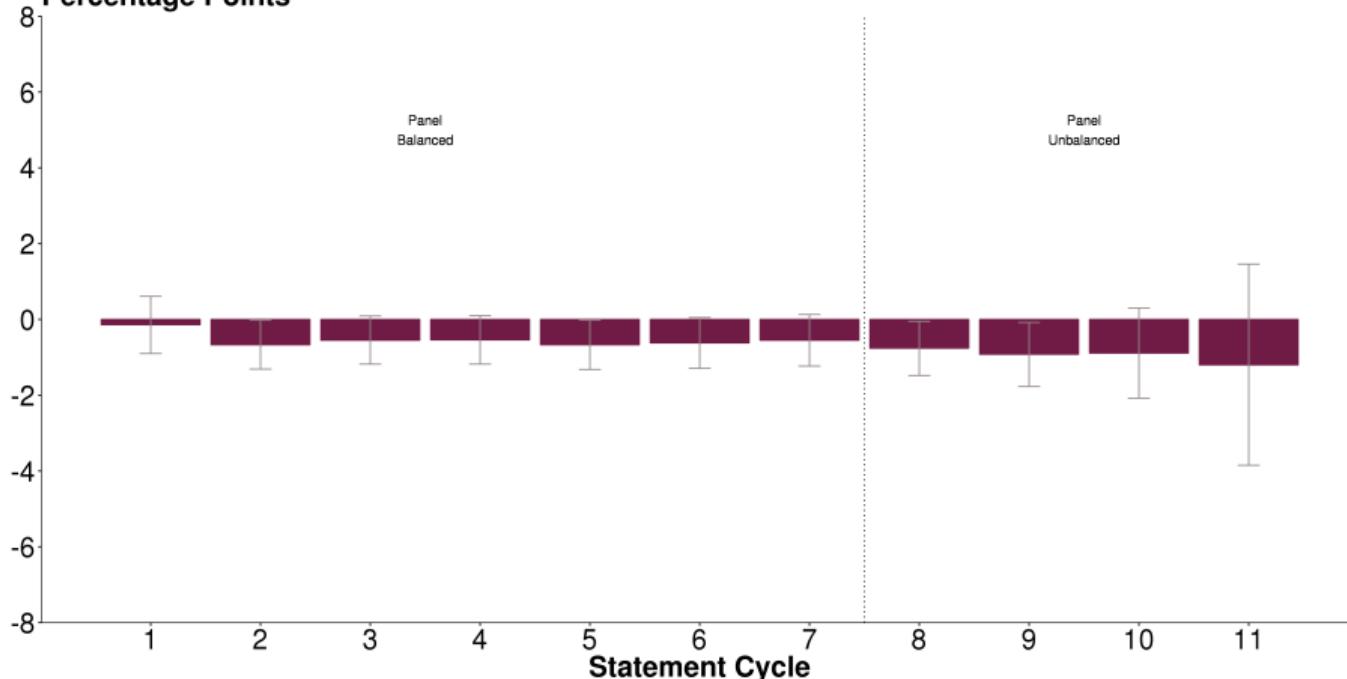


STATEMENT BALANCE NET OF PAYMENTS (£)



STATEMENT BALANCE NET OF PAYMENTS (%)

Treatment Effect on
Statement Balance Net of Payments as a % of Statement Balance,
Percentage Points



Indicates largest effect for smallest bals (next steps: HTE credit limit, credit score) 🚀

 PRIMARY OUTCOMES POOLED OVER STATEMENTS

Outcome	Estimate (S.E.)
Any minimum payment	-0.0809*** (0.0033)
Any full payment	0.0044 (0.0028)
Any payment less than minimum payment	0.004*** (0.0011)
Statement balance net of payments (% statement balance)	-0.006* (0.0027)
Costs (% statement balance)	-0.0001 (0.0002)
Transactions (% statement balance)	0.0015 (0.002)
CRA share of credit cards only paying minimum	-0.0267*** (0.0017)
CRA share of credit cards making full payment	0.0005 (0.0023)
CRA share of credit cards missing payment	0.0004 (0.0007)
CRA total credit card statement balances net of payments (% statement balance)	-0.0039 (0.0022)

 SECONDARY OUTCOMES

Outcome	All
Any automatic payment set-up	-0.0427*** (0.0041)
Any automatic minimum payment set-up	-0.2173*** (0.0041)
Any automatic fixed payment set-up	0.1678*** (0.0045)
Any automatic fixed payment set-up exceeding contractual minimum payment	0.0865*** (0.0043)
Any automatic full payment set-up	0.0069* (0.0028)
Cumulative payments across statements	7.0689 (16.219)
Cumulative automatic payments across statements	27.7215** (10.364)
Cumulative manual payments across statements	-18.888 (13.9749)
Total payments (% statement balance)	0.0064 (0.0034)
Automatic payments (% statement balance)	0.0075** (0.0027)
Manual payments (% statement balance)	-0.0005 (0.003)
Payments via both automatic AND manual	0.0131*** (0.0026)
Automatic payments as a % of total payments	-0.0061 (0.0051)

► PRIMARY OUTCOMES BY AUTOMATIC PAYMENT ENROLLMENT

Outcome	Enrolled	Not Enrolled
Any minimum payment	-0.088*** (0.005)	0.0178** (0.0066)
Any full payment	0.0078* (0.0039)	-0.0116 (0.0088)
Any payment less than minimum payment	-0.0003 (0.0007)	-0.0088 (0.007)
Statement balance net of payments (% statement balance)	-0.0096** (0.0037)	0.012 (0.0083)
Costs (% statement balance)	-0.0007 (0.0006)	-0.0004 (0.0018)
Transactions (% statement balance)	0.0071* (0.0035)	-0.0049 (0.0067)
CRA share of credit cards only paying minimum	-0.0355*** (0.0032)	0.0151*** (0.0052)
CRA share of credit cards making full payment	0.0048 (0.0036)	-0.004 (0.0076)
CRA share of credit cards missing payment	-0.0009 (0.0006)	-0.0094* (0.0047)
CRA total credit card statement balances net of payments (% statement balance)	-0.0092** (0.0034)	0.0046 (0.0075)

► BALANCE CHECKS

Variable	Control	Treatment	Difference	95% C.I.
Age (years)	36.46	36.61	0.15	[0.09, 0.39]
Female (% cards)	46.05	46.13	0.08	[0.89, 1.04]
Credit Limit (£)	4312.64	4384.31	71.66*	[5.3, 138.02]
Credit Score (0-100)	65.26	65.38	0.12	[0.03, 0.26]
Purchases Rate (%)	22.85	22.82	-0.03	[0.15, 0.09]
Balance Transfer (% cards)	28.99	29.76	0.77	[0.11, 1.66]
Total Credit Card Statement Balances (£)	2364.66	2439.02	74.36	[0.57, 149.29]
Total Credit Card Statement Balances Net of Payments (£)	2000.92	2072.44	71.52*	[2.95, 140.09]

Statistical significance denoted at *** 0.5%, ** 1.0%, * 5.0%. N (control) = 20,617 and N (treatment) = 20,091 cards.

UNCONDITIONAL MEANS

Outcome	Control	Treatment	Difference	95% C.I.
Any minimum payment	0.3012	0.2323	-0.0689***	[-0.0775, -0.0603]
Any full payment	0.2397	0.2417	0.0019	[-0.0064, 0.0102]
Any payment less than minimum payment	0.0369	0.0403	0.0034	[-0.0003, 0.0071]
Statement balance net of payments (% statement balance)	0.6936	0.691	-0.0026	[-0.0106, 0.0054]
Costs (% statement balance)	0.0111	0.0107	-0.0004	[-0.0016, 0.0009]
Transactions (% statement balance)	0.2007	0.2013	0.0006	[-0.0062, 0.0075]
CRA share of credit cards only paying minimum	0.2012	0.1775	-0.0237***	[-0.0295, -0.0179]
CRA share of credit cards making full payment	0.4414	0.4424	0.0011	[-0.0062, 0.0084]
CRA share of credit cards missing payment	0.0296	0.0291	-0.0004	[-0.003, 0.0021]
CRA total credit card statement balances net of payments (% statement balances)	0.6954	0.6912	-0.0042	[-0.0117, 0.0034]

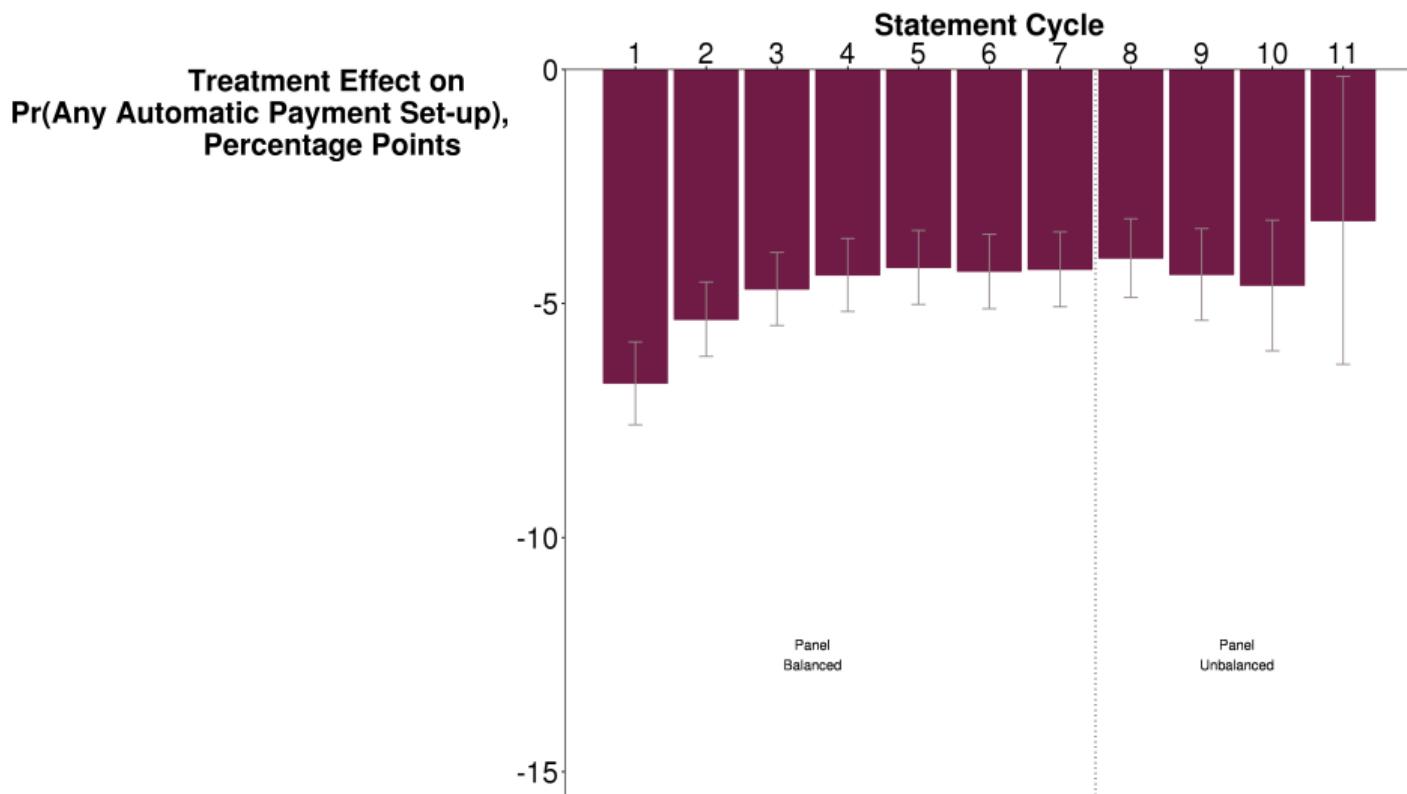
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► BALANCE CHECKS (LENDER 2)

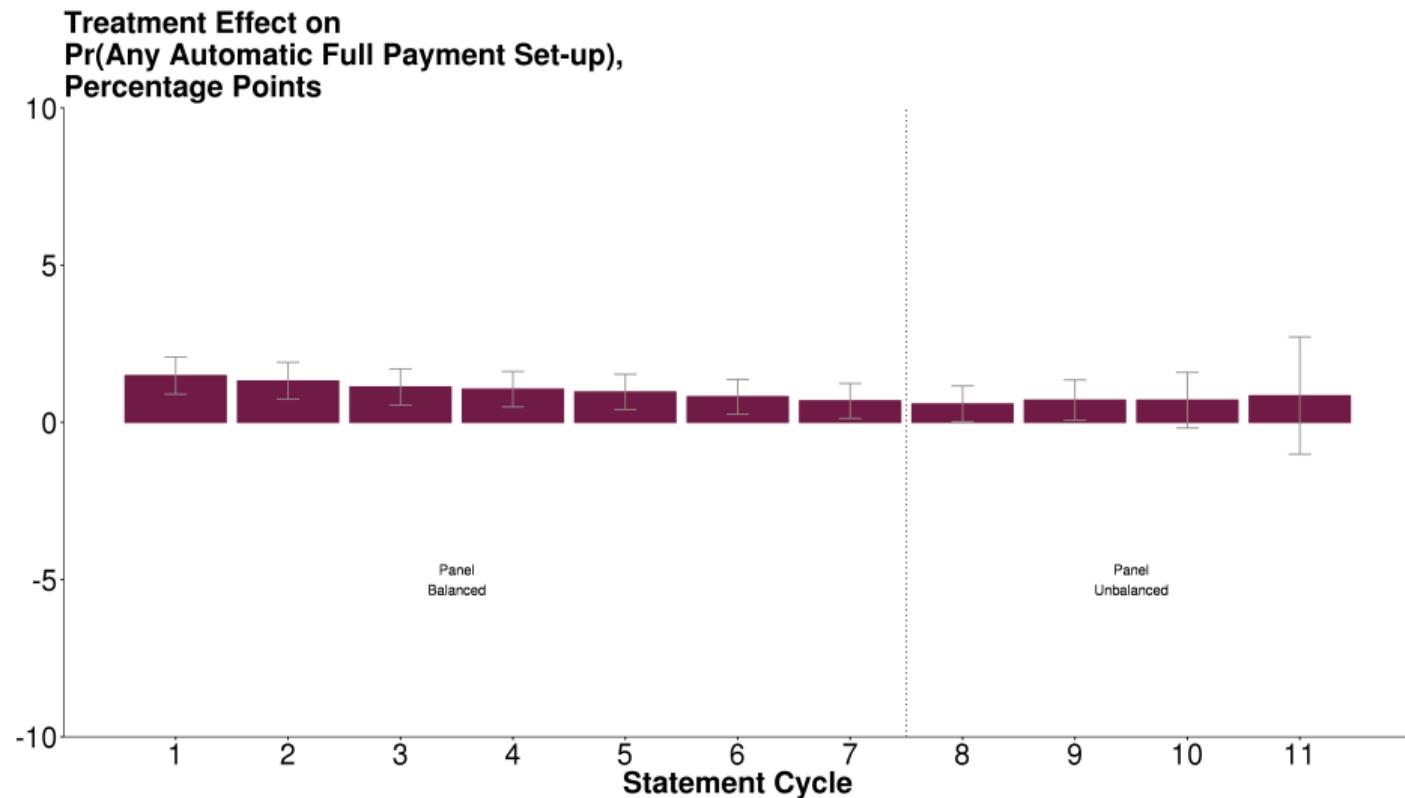
Variable	Control	Treatment	Difference	95% C.I.
Age (years)	37.04	36.41	-0.63	[-1.83, 0.57]
Female (% cards)	47.7	52.21	4.51	[-0.5, 9.52]
Credit Limit (£)	571.49	538.31	-33.18	[-90.28, 23.92]
Credit Score (0-100)	53.75	54.2	0.44	[-0.48, 1.37]
Purchases Rate (%)	22.93	23.46	0.53	[-0.64, 1.7]
Balance Transfer (% cards)	17.43	17.57	0.14	[-3.67, 3.95]
Total Credit Card Statement Balances (£)	956.9	885.6	-71.3	[-279.39, 136.79]
Total Credit Card Statement Balances Net of Payments (£)	871.52	813.65	-57.87	[-253.6, 137.87]

Statistical significance denoted at *** 0.5%, ** 1.0%, * 5.0%. N (control) = 740 and N (treatment) = 791 cards.

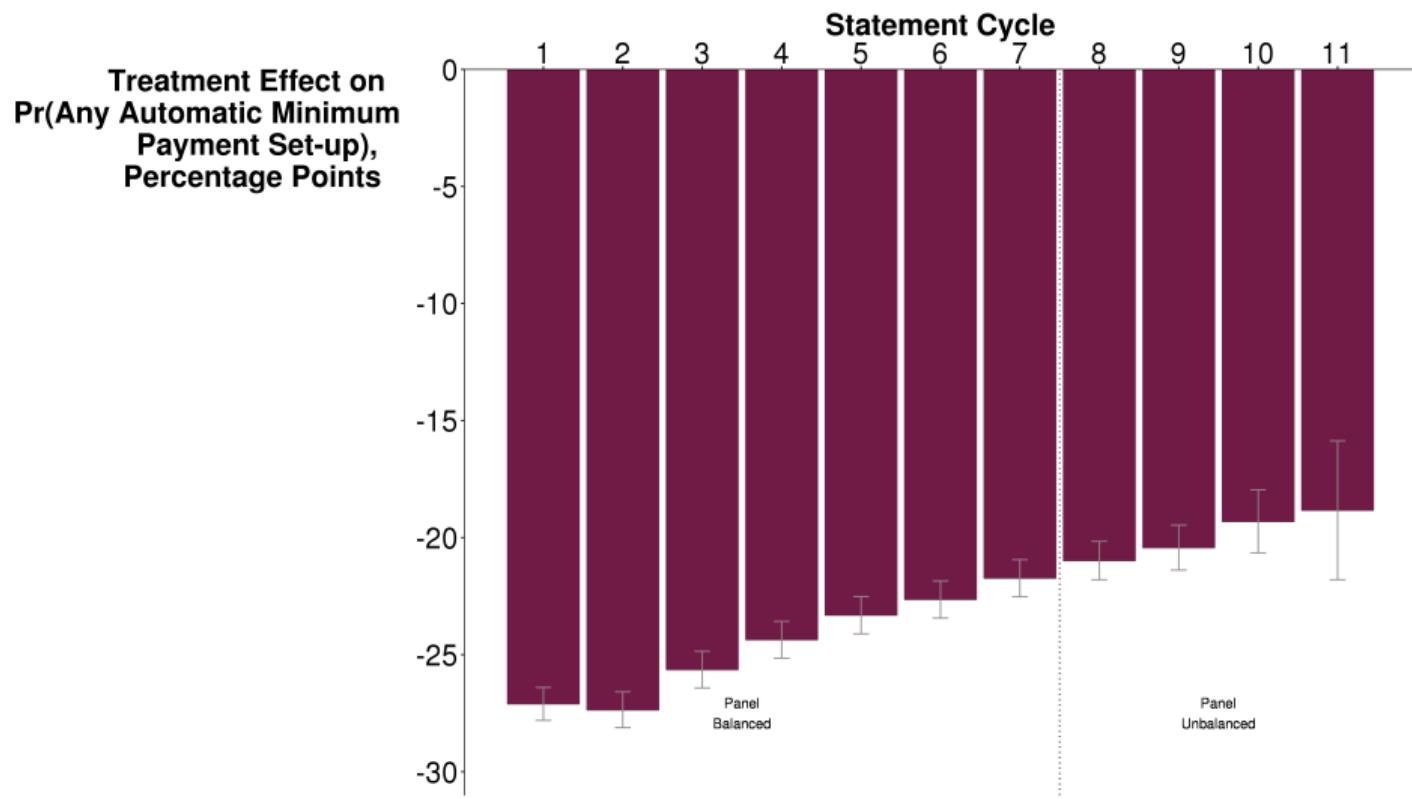
ANY AUTOMATIC PAYMENT ENROLLMENT (STATEMENTS 1-11)



AUTOMATIC FULL PAYMENT ENROLLMENT (STATEMENTS 1-11)



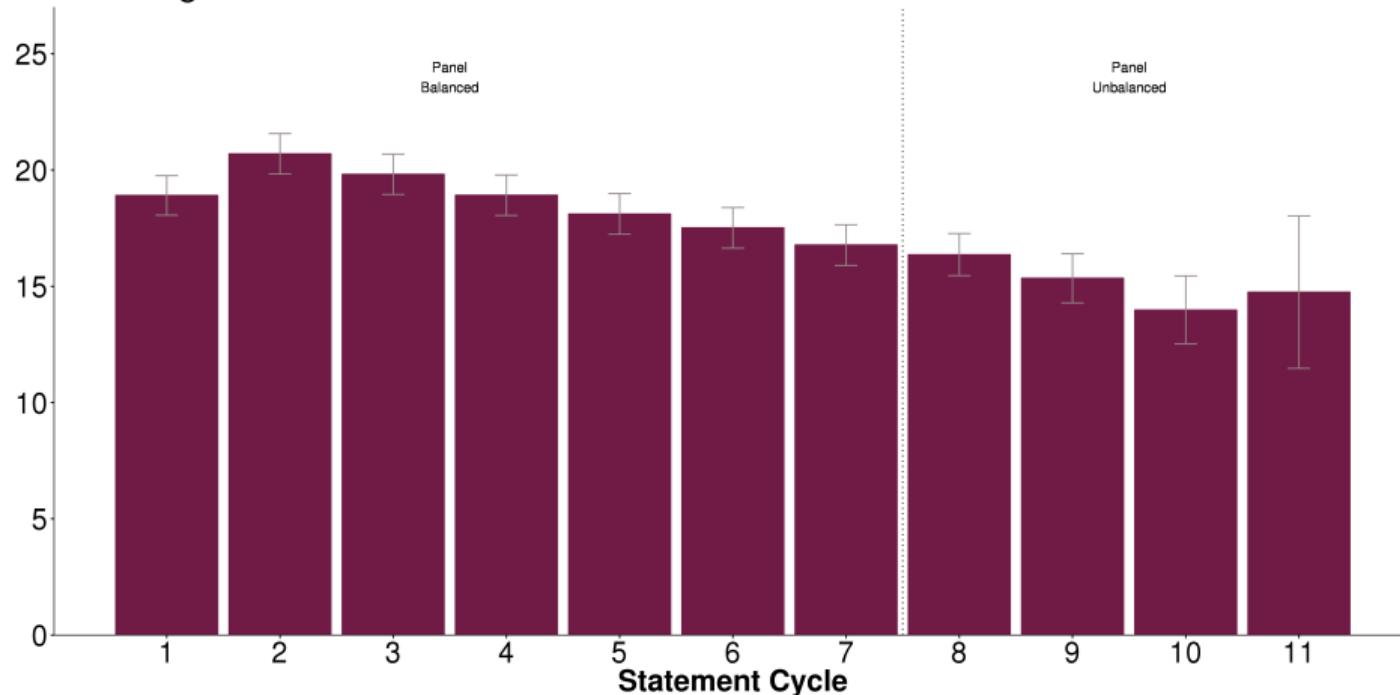
AUTOMATIC MINIMUM PAYMENT ENROLLMENT (STATEMENTS 1-11)



AUTOMATIC FIXED PAYMENT ENROLLMENT (STATEMENTS 1-11)

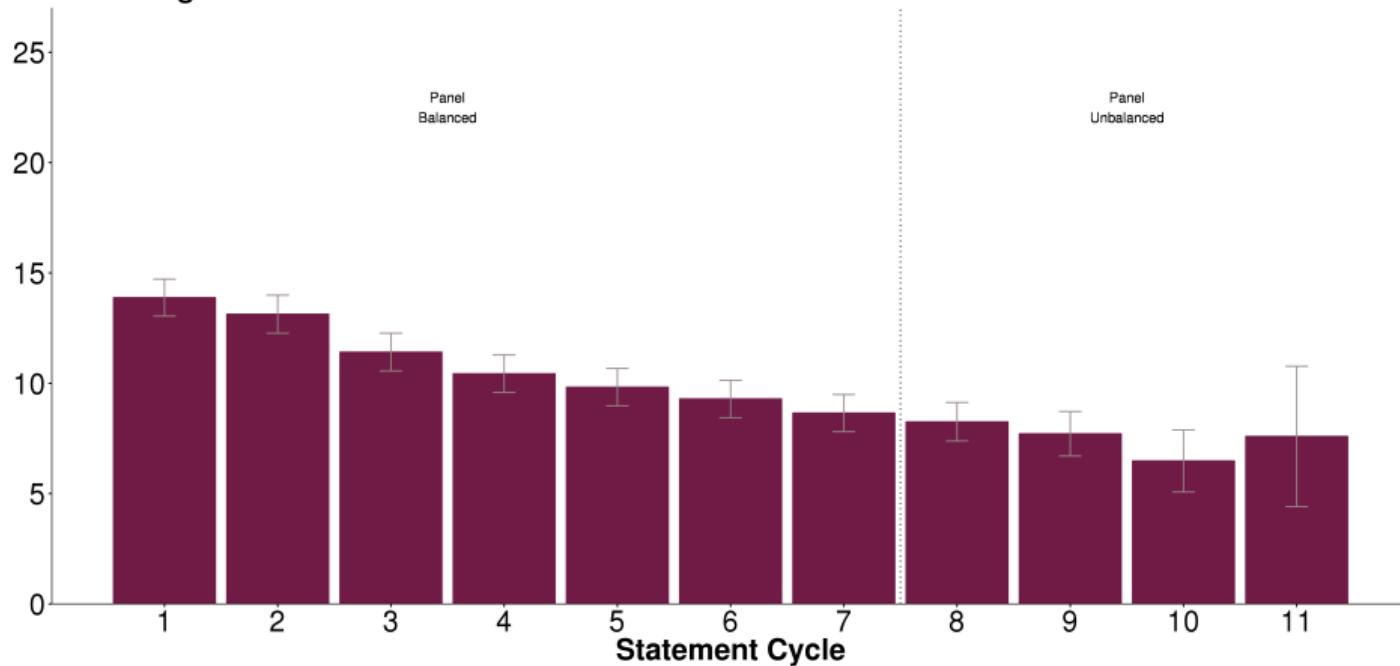
62% at round numbers (£100, 50,200 most popular). <1% select £5.

Treatment Effect on
 $\text{Pr}(\text{Any Automatic Fixed Payment Set-up})$,
Percentage Points



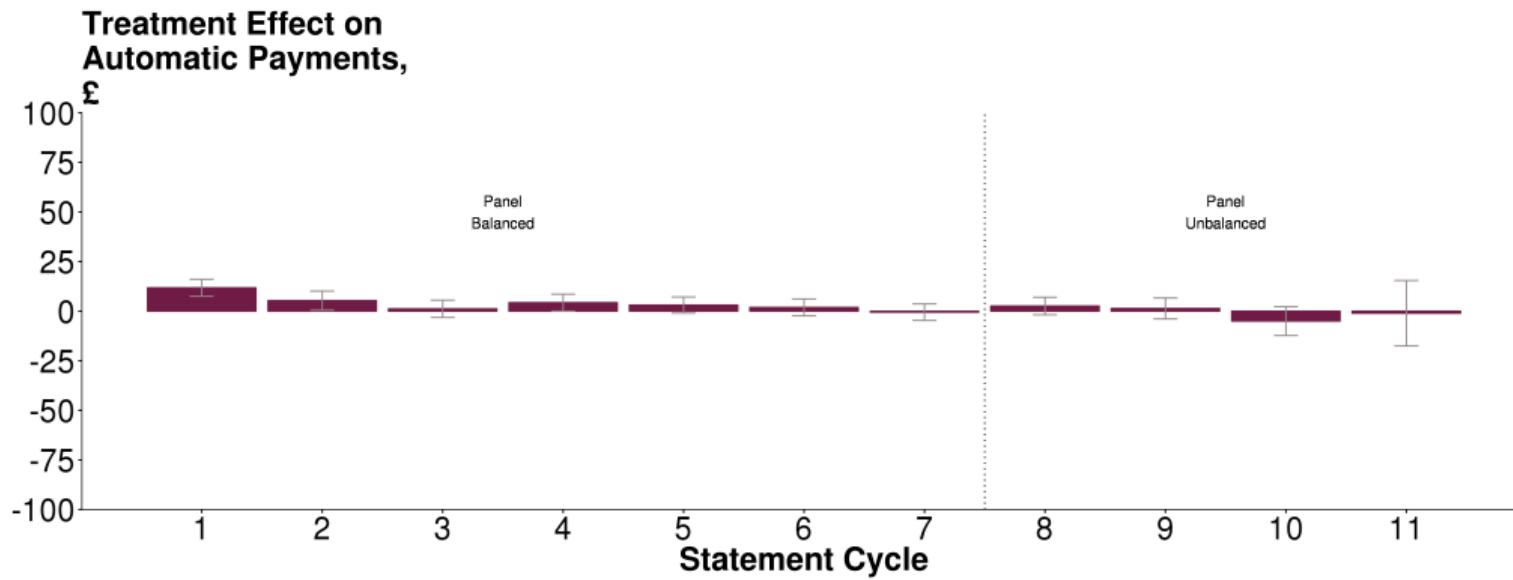
AUTOMATIC NON-BINDING FIXED PAYMENT ENROLLMENT

Treatment Effect on
 $\Pr(\text{Any Automatic Fixed Payment Set-up
for Greater than Contractual Minimum Payment}),$
Percentage Points

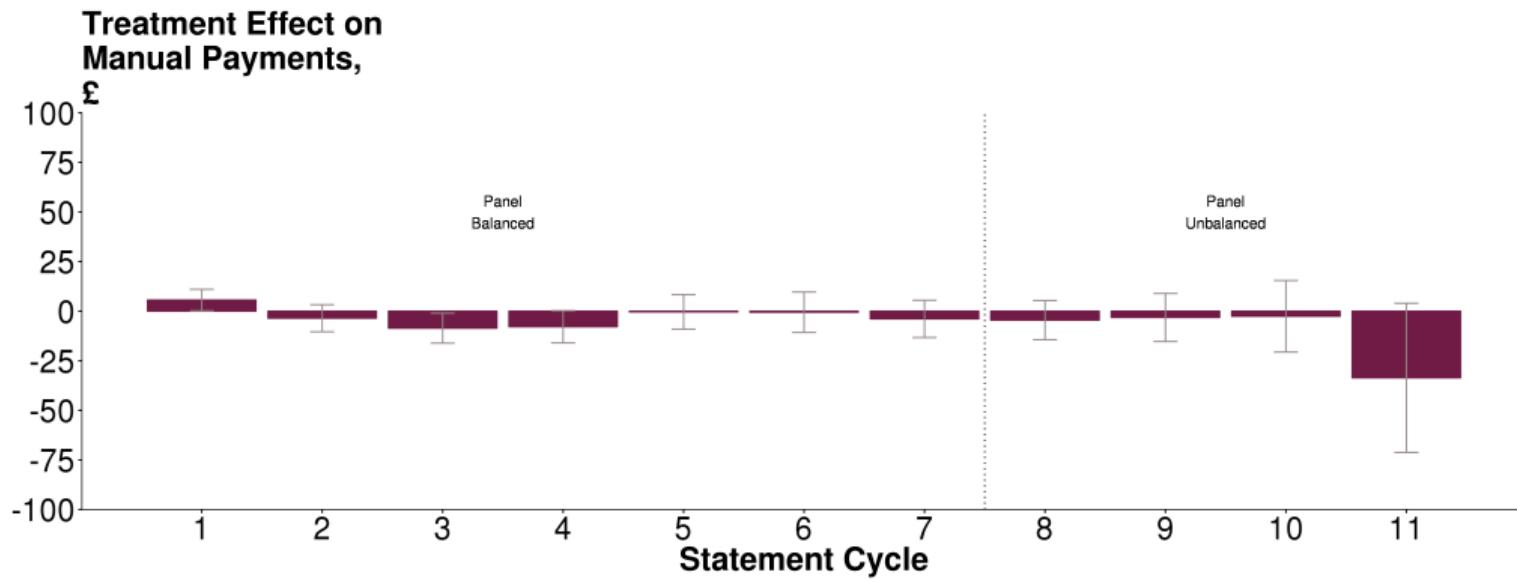


(next steps: study distribution of autopay vs. minimum)

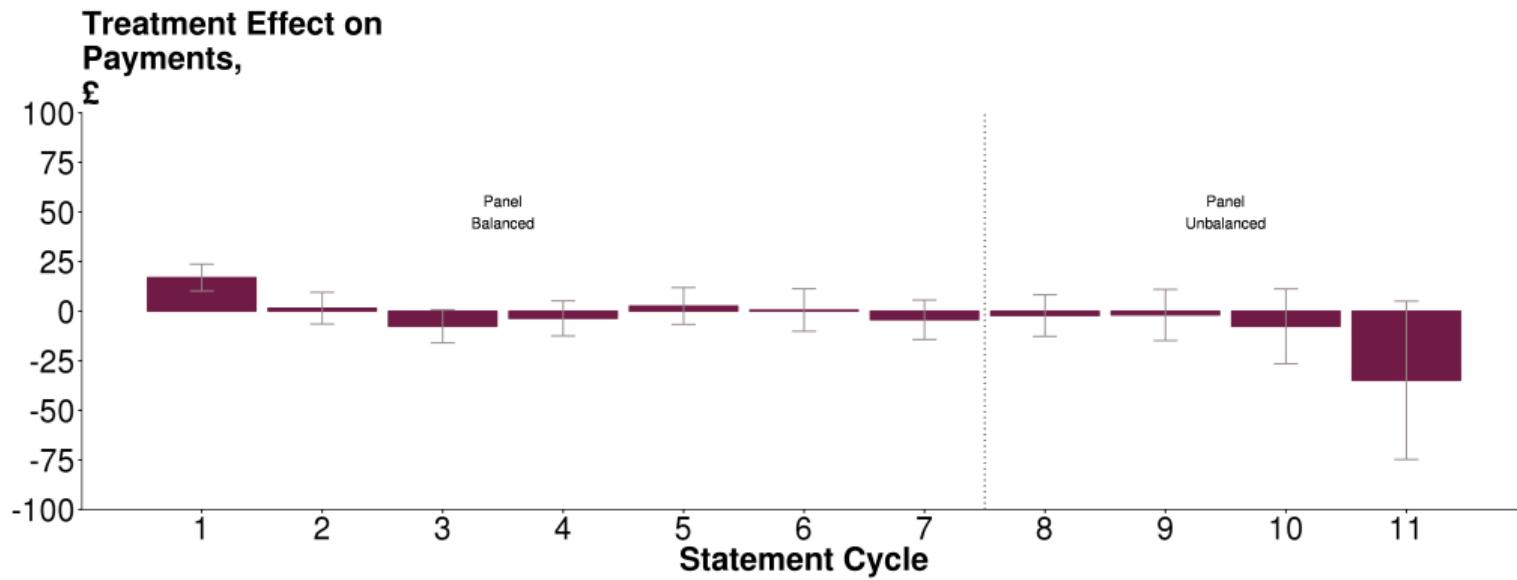
AUTOMATIC PAYMENTS (STATEMENTS 1-11)



MANUAL PAYMENTS (STATEMENTS 1-11)



ALL (AUTOMATIC + MANUAL) PAYMENTS (STATEMENTS 1-11)



ARREARS

Outcome	Estimate (S.E.)	95% C.I.	P Value	Adj. R2
Arrears (1+ payments behind)	0.003*** (0.001)	[0.001, 0.005]	0.0029	0.038
Arrears (2+ payments behind)	0.0004 (0.0007)	[-0.001, 0.0018]	0.5681	0.0273
Arrears (3+ payments behind)	0.0001 (0.0005)	[-0.0009, 0.0012]	0.7862	0.0204

Statistical significance denoted at *** 0.5%, ** 1.0%, * 5.0%. Table shows average treatment effects pooled across all completed statement cycles. OLS regressions from Equation 3 where time-varying treatment-cycle interactions replaced with a single time-invariant treatment coefficient. Standard errors clustered at card-level. 40,708 credit cards with 368,063 degrees of freedom .



 BORROWING TRADE-OFS

Benefits Consumption smoothing (intra-month pay cycles, income + expenditure shocks)

Costs Interest (lower consumption), -ve credit score (future credit access), psychological costs (e.g. Gathergood, 12; Richardson et al., 13; Gathergood & Guttman-Kenney, 16)



CREDIT CARD MOTIVATING FACTS

Debt stock 50+% higher than models can explain (e.g. Angeletos et al., 01)

Co-holding high-interest credit cards and liquid assets (e.g. Gross & Souleles, 02)

MPB High borrowing in response to credit limit increases (e.g. Agarwal et al., 15)

Price gaps Gaps in interest rates offered (e.g. Zinman, 14).

Price dispersion Same borrowers have v.different APRs (e.g. Stango & Zinman, 15).

Minimum payment concentration 29% pay at/near minimum (e.g. Keys & Wang, 19)

Balance-matching Pay proportional to balances (e.g. Gathergood et al., 19)

Financial illiteracy Misunderstandings, mistakes (e.g. Agarwal et al., 09)



NUDGES IN 2020

Meta-analyses shows small effects (but cost-effective)

Benartzi et al. (17 Psych. Science)

+0.6 s.d, (58 RCTs) Jachimowicz et al. (19 BPP)

+1.4 pp (126 RCTs) vs +8.7pp (26 pubs) DellaVigna & Linos (20)

Offsetting effects Beshears et al. (17), Choukhmane (19)

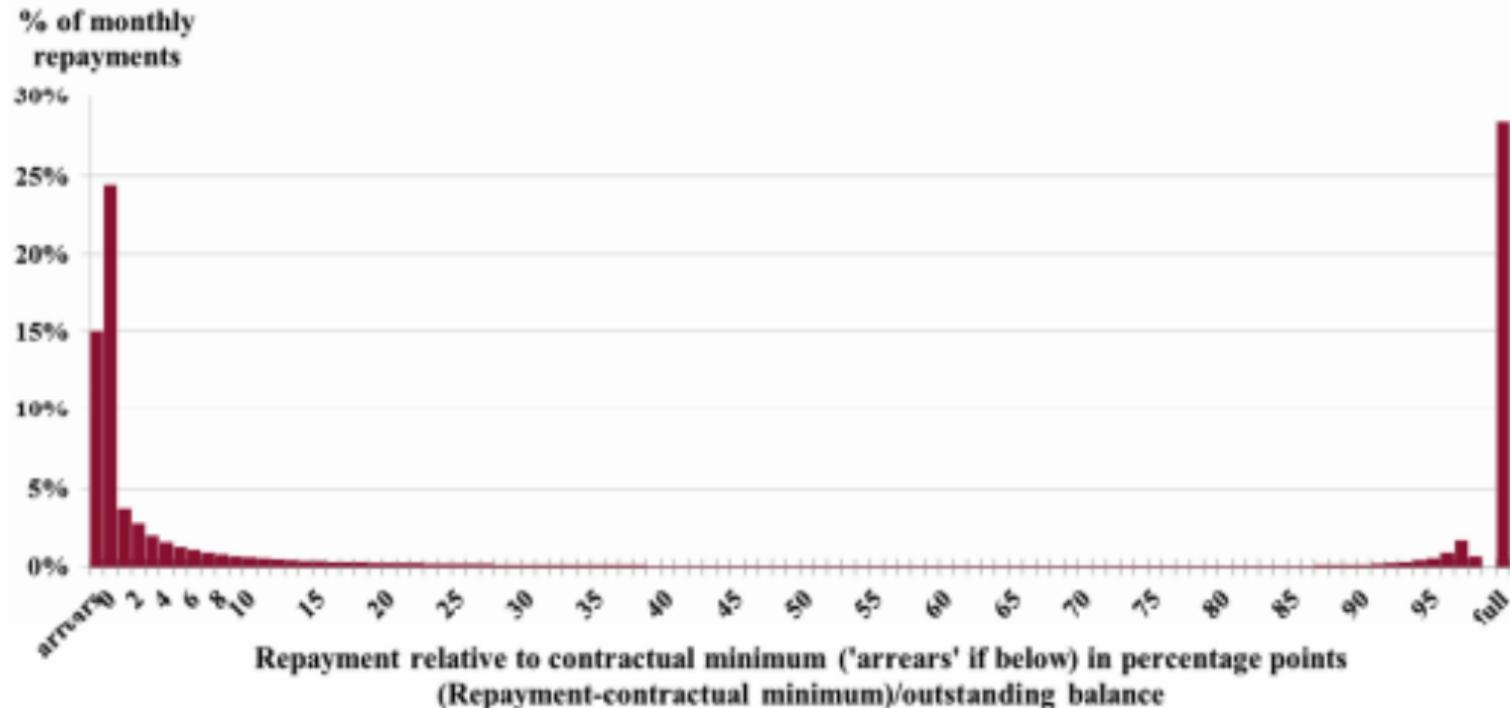
Proximate vs. Distal Laibson (20 AEA/AFA).

Welfare effects Benkert & Netzer (18 JPE), Allcott & Kessler (19 AEJ: App)

Nudges vs. hard paternalism? Loewenstein & Chater (17 BPP), covid...



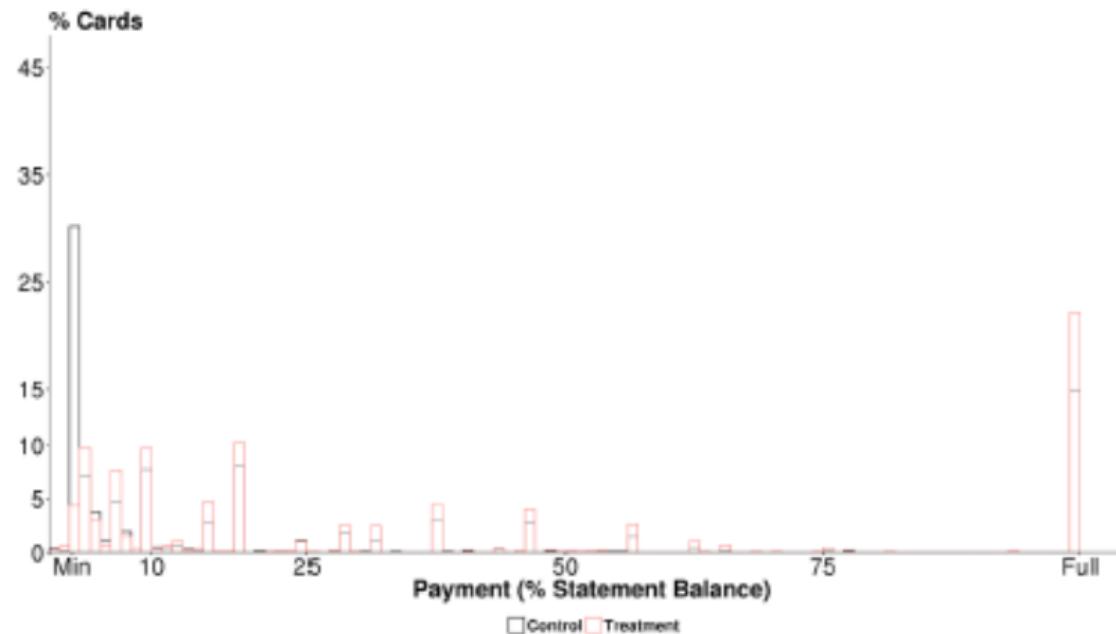
► UK PAYMENT DISTRIBUTION (FCA, 16)



Consistent with US data (Keys & Wang, 19) ↗

► DE-ANCHORING MANUAL PAYMENTS (STEWART, 09; GUTTMAN-KENNEY, LEARY & STEWART, 18)

Figure 4: Effect of treatment on distribution of payments (as a % of statement balance) in hypothetical scenarios



Large proximate effect...no lender willing/able to run RCT in field ➔

► DISCLOSURES (ADAMS ET AL., 18)

A quicker way to repay your balance

Dear

You are currently set up to pay the minimum payment for your credit card by Direct Debit every month. This can be a useful way to manage your monthly budget, but if you continue to pay just the minimum amount, it can take much longer to clear your balance and it will cost you more in interest.

See the difference an increased fixed payment could make

Even a small increase in the amount you pay each month can speed up how quickly you repay your balance.

The examples below are based on your September statement balance of **£5739.42** and your minimum payment of **£60.86**. It shows how different monthly payments could reduce the time it takes to pay off your card.

Monthly direct debit amount

£170	1 year to repay balance and paying £3 in interest
£242	2 years to repay balance and paying £54 in interest
£480	3 years to repay balance and paying £346 in interest
Minimum	Over 28 years to repay balance and paying £6722 in interest

See the chart

- To see how much you could save

It's easy to increase your monthly payments:

- Log on to Internet Banking
- Ask in branch
- Call 0800 111 1122
Lines are open 24 hours a day, 7 days a week

£1029.90, ONLY PAY MINIMUM, NO FURTHER SPENDING
HOW LONG EXPECT TO TAKE TO REPAY? (ADAMS ET AL., 18)

