Minimum Payments and Debt Paydown in Consumer Credit Cards

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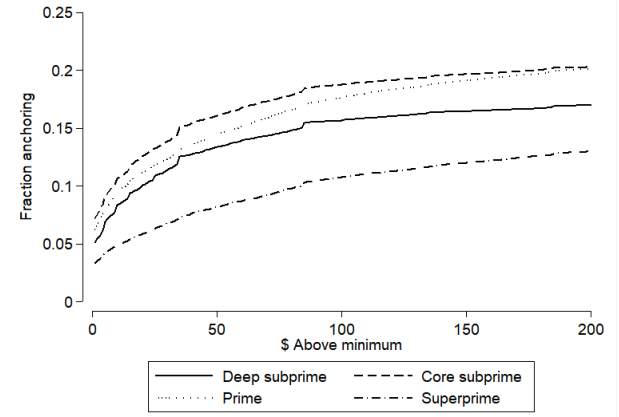
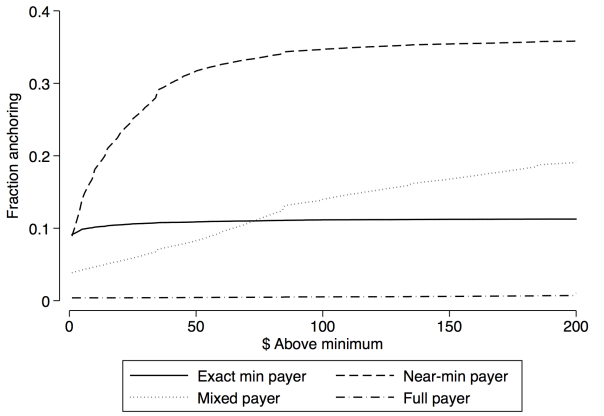
Fig. A.1. Sensitivity of anchoring estimates.

The figures show the sensitivity of estimates of θ^*, the fraction of all accounts that anchor to the minimum payment, to assumptions about the set of accounts potentially susceptible to anchoring. Each graph shows the estimate of the share of anchoring accounts as a function of whether payments within a given band ($\bar{X}$ in the text) of the minimum varying between $1 and $200 are assumed to be susceptible to anchoring. The graphs show sensitivity estimates for the stratified regressions shown in Table **??**.

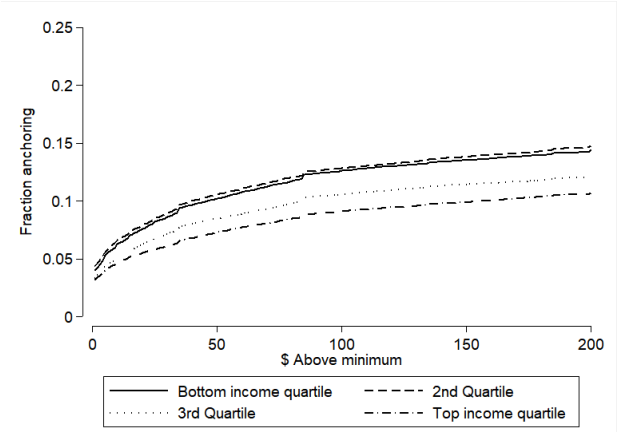
(a) By FICO band



(b) By payer type



(c) By income quartile



(d) By age quartile

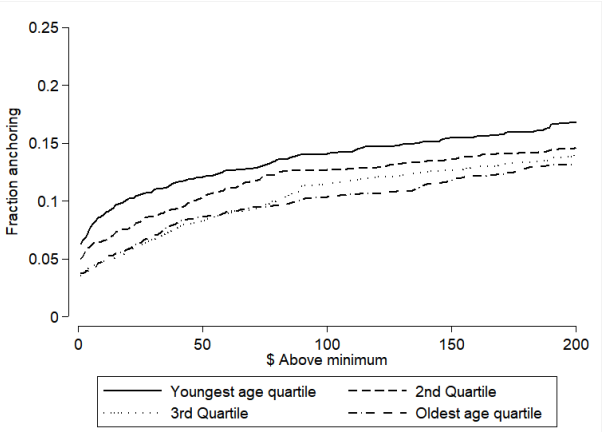
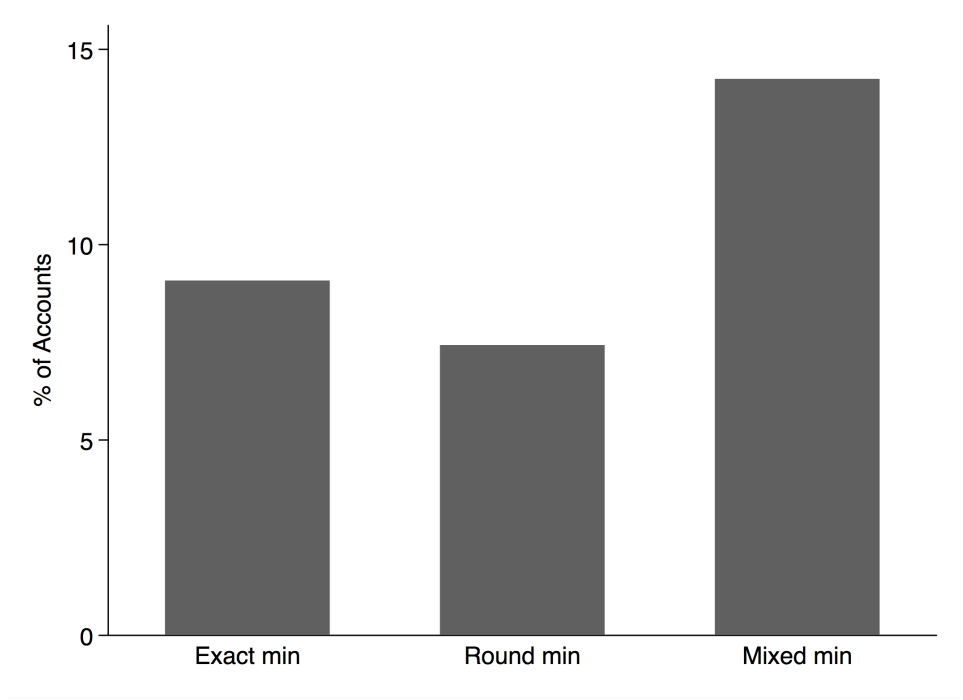


Fig. A.2. Prevalence of round minimum payments and payers.

Panel A shows the distribution of accounts by payer type, and Panel B shows the composition of payments for positive-balance months within each payer type. Each account is classified into a payer type based on whether the account paid exactly the minimum amount, paid a rounded minimum amount, or paid other near-minimum amounts in at least 50% of months. Accounts that did not pay any exact or near-minimum amount in at least 50% of months are included in the denominator of Panel A, but are omitted from the figure. Payments are defined as "rounded" minimum if they are equal to the minimum rounded to the nearest $5, $10, $25, $50, or $100. Payments are defined as "near" the minimum if they are strictly greater than but within $50 of the minimum, and are not a "rounded minimum" amount.

Panel A: Distribution of payer types



Panel B: Consistency of payments within payer type

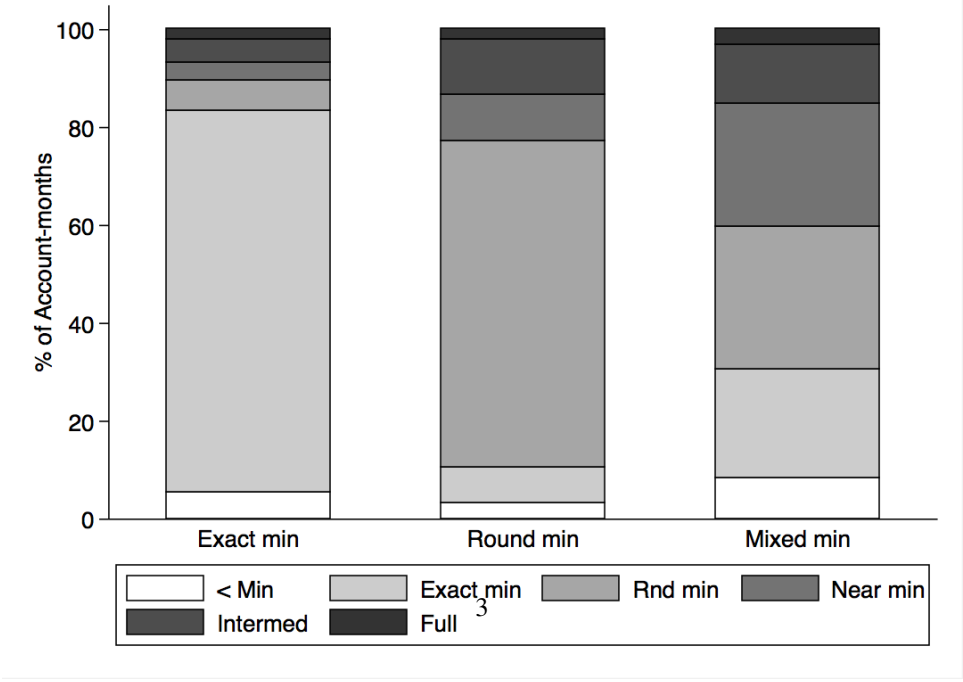


Fig. A.3. Distribution of consumer characteristics for minimum and near-minimum payers.

This figure shows the distributions of payer types by borrower characteristics. Each account is classified into a payer type based on whether the account paid exactly the minimum amount, paid a rounded minimum amount, or paid other near-minimum amounts in at least 50% of months. Payments are defined as "rounded" minimum if they are equal to the minimum rounded to the nearest $5, $10, $25, $50, or $100. Payments are defined as "near" the minimum if they are strictly greater than but within $50 of the minimum, and are not a "rounded minimum" amount.

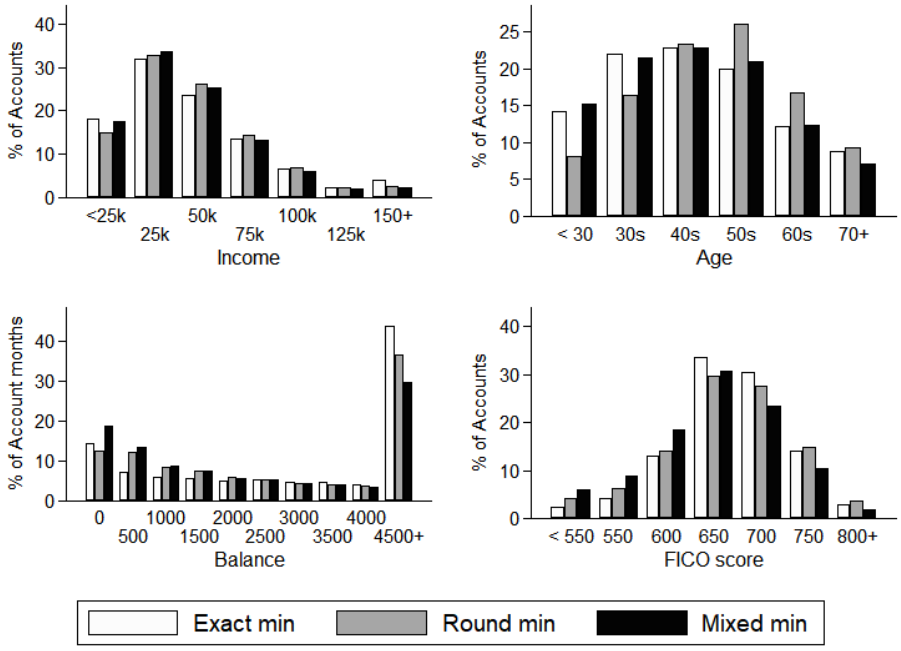


Fig. A.4. Illustration of stylized CDF for anchoring calculations.

The figure shows the CDF of payments when the minimum payment is equal to Min_1. F_2 denotes the fraction of payments less than or equal to a potential higher minimum payment Min_2, and δ denotes the fraction of payments less than or equal to $Min_1 + \bar{X}$, for some $\bar{X} > 0$. The cumulative distribution has discontinuities at Min_1 and the full balance, where consumers bunch at making exactly the minimum payment and paying their balances in full.

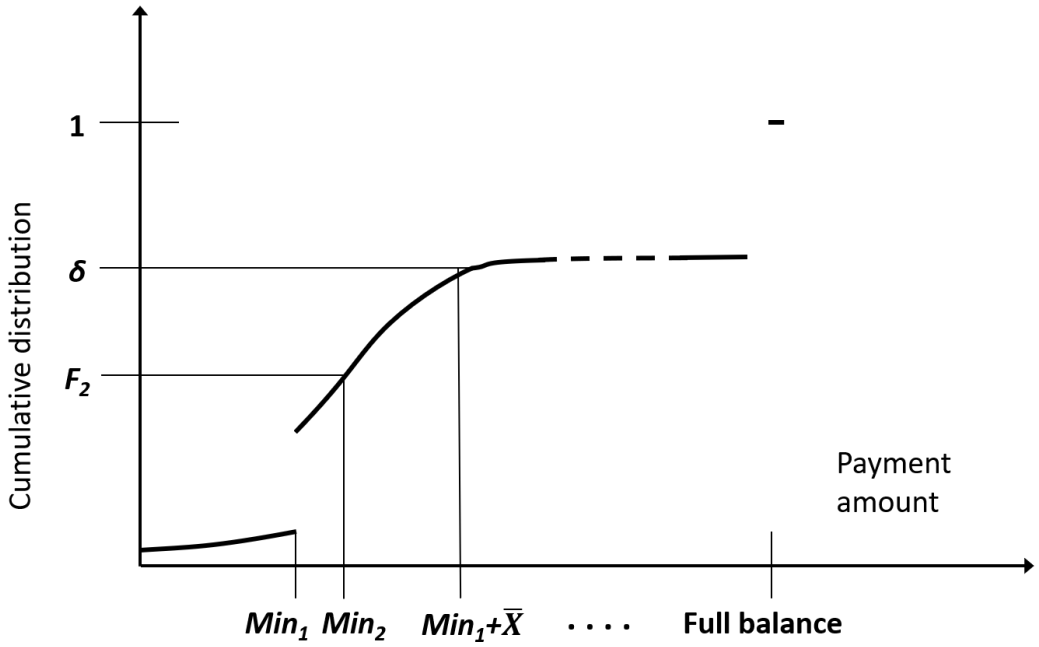
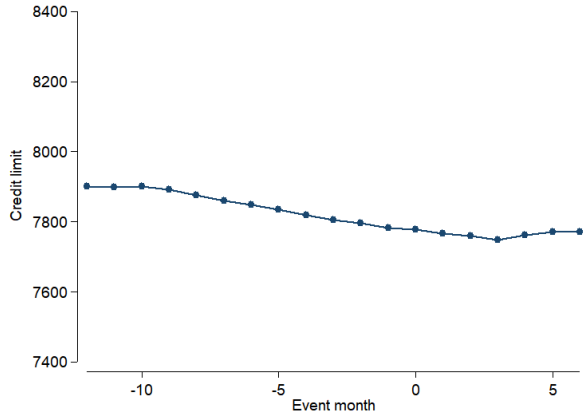


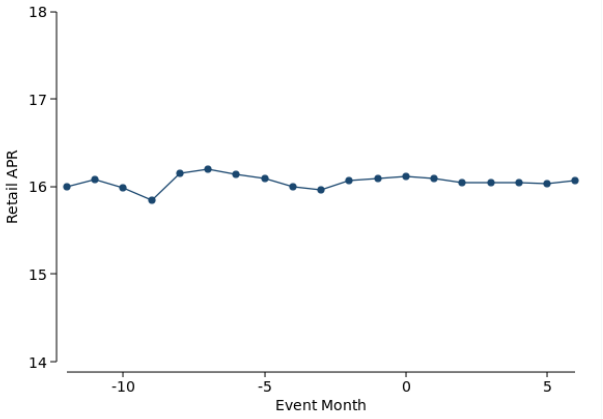
Fig. A.5. Account characteristics before and after formula changes.

The figures show mean account characteristics for each month before and after minimum payment formula changes.

(a) Credit limit



(b) APR



(c) Share with zero APR

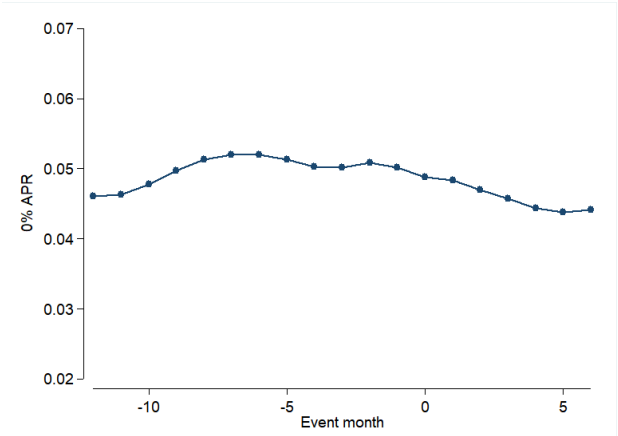
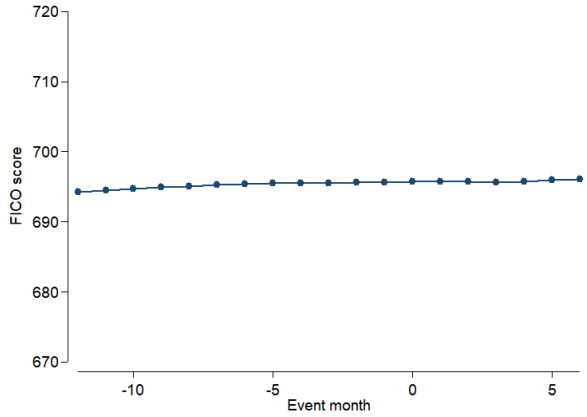


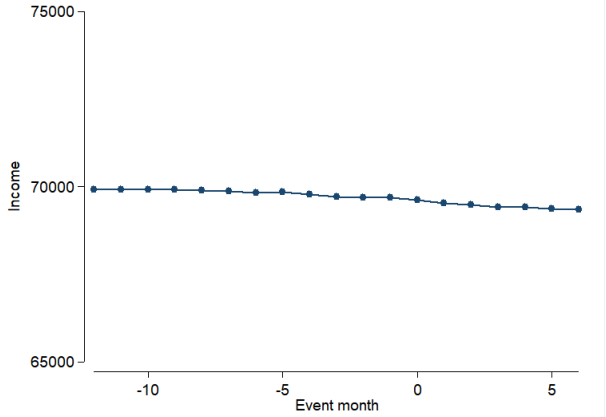
Fig. A.6. Borrower characteristics before and after formula changes.

The figures show mean borrower characteristics for each month before and after minimum payment formula changes.

(a) FICO at origination



(b) Borrower income



(c) Borrower age

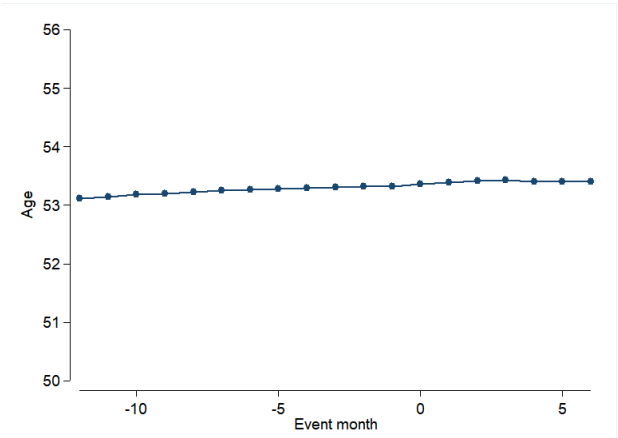
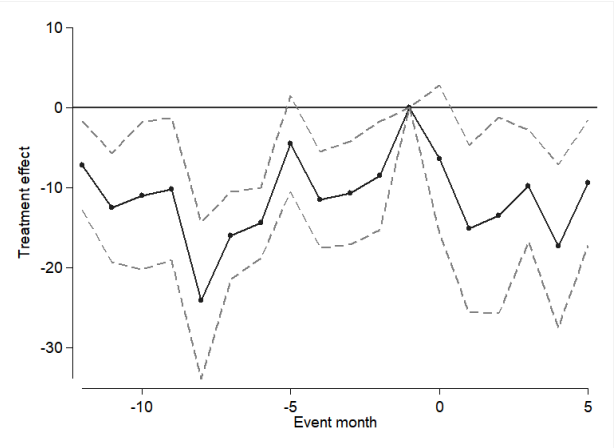


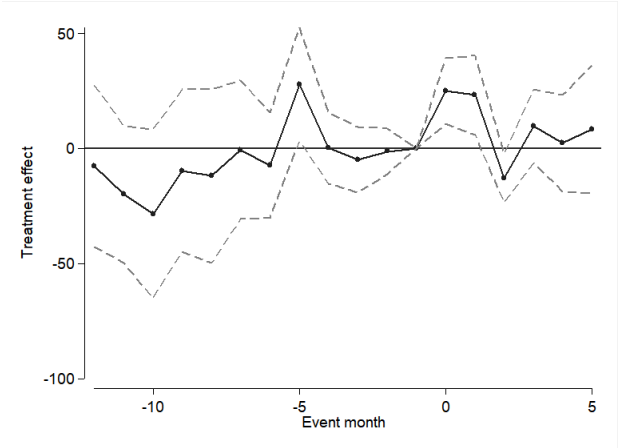
Fig. A.7. Spillover effects of formula changes.

The figures show difference-in-differences regression estimates for the effects of minimum payment changes on purchases, balances, and number of open cards. The sample includes accounts that were potentially treated with one of four formula changes that increased the minimum payment. The regressions include only time fixed effects and fixed effects for issuer formula type interacted with FICO decile as independent variables. The solid lines show point estimates, and the dashed lines show 95% confidence intervals using standard errors that cluster by issuer formula type interacted with FICO decile.

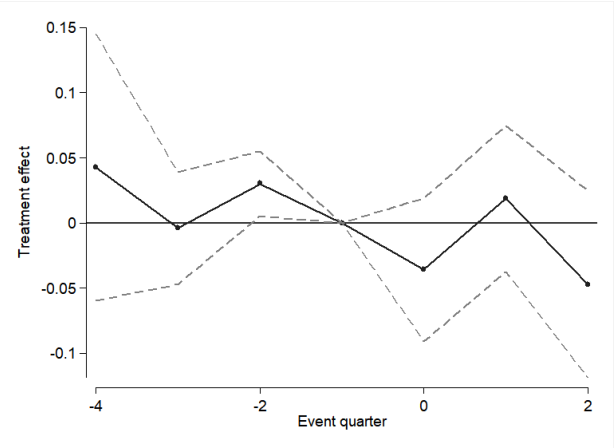
(a) Purchases on affected card



(b) Total Balance on affected card



(c) Total Number of open cards



(d) Total balance on all open cards

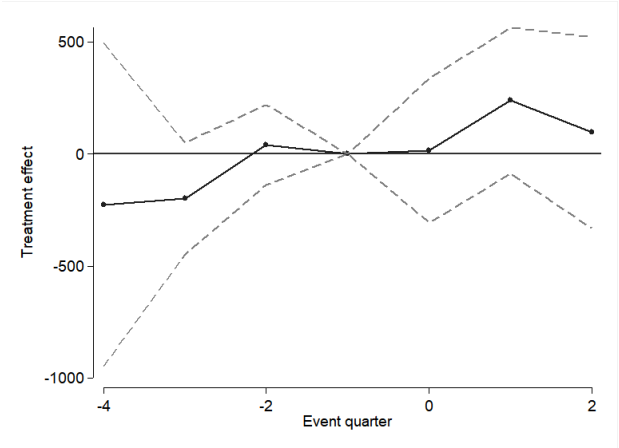


Table A.1

Summary statistics by payer type.

The table provides summary statistics for accounts in each payer type. Each account is classified into a payer type based on whether the account was paid in full or paid at or near the minimum amount in at least 50% of months. Accounts that did not pay any of these three amounts in 50% of months are classified as mixed payers. The sample definition is the same as that in Table **??**.

	Mean	Median	Std. dev.	Mean	Median	Std. dev.	Mean	Median	Std. dev.	Mean	Median	Std. dev.
	A. Min payer			B. Near-min payer			C. Mixed payer			D. Full payer		
Card and account												
Income	$58,325	$47,499	$44,926	$56,579	$48,000	$66,097	$66,097	$57,499	$48,723	$74,117	$62,000	$56,259
FICO at origination	692	693	58	671	678	71	693	701	77	762	772	53
Account age (years)	8.93	6.65	8	7.09	4.84	7	8.01	5.39	8	12.72	12.09	8
Age of primary account-holder	48.57	47	15	48.66	48	15	49.95	50	15	56.60	57	17
Credit limit	$7,490	$6,000	$6,448	$7,048	$4,800	$7,069	$9,307	$7,500	$8,520	$13,402	$11,900	$10,033
Retail APR	15.03	16.00	10	16.98	16.99	9	16.75	15.99	9	14.82	14.00	5
Joint account	6%			4%			6%			16%		
Has annual fee	7%			15%			12%			12%		
All card acounts												
# of Open cards	3.79	3.00	3	4.07	3.00	3	3.07	3.00	2	2.19	2.00	1
Total balance	$17,837	$12,117	$1,982	$17,533	$18,173	$12,030	$12,030	$6,322	$16,889	$3,412	$1,467	$12,029
Total credit limit	$34,974	$25,300	$33,542	$36,156	$26,700	$33,647	$40,802	$30,900	$37,433	$38,932	$30,400	$35,040
# of New cards in last 3 months	0.05	0	0	0.06	0	0	0.07	0	0	0.05	0	0
# of Cards 60+ days past due	0.06	0	0	0.05	0	0	0.04	0	0	0.00	0	0
Purchases and balances												
Utilization	73%	89%	30%	68%	80%	30%	48%	45%	40%	11%	6%	20%
Balance	$5,045	$3,787	$5,000	$4,062	$2,416	$4,638	$3,558	$1,555	$5,122	$1,258	$566	$2,355
Promotional	$737	$0	$2,527	$815	$0	$2,449	$675	$0	$2,392	$52	$0	$660
Cash advance	$383	$0	$1,512	$308	$0	$1,273	$157	$0	$970	$6	$0	$200
Penalty	$362	$0	$1,793	$388	$0	$1,764	$607	$0	$2,465	$65	$0	$611
Purchase volume	$83	$0	$371	$103	$0	$351	$335	$31	$1,009	$1,230	$581	$2,428
Purchase volume > 0	30%			42%			58%			99%		
Payment and delinquency behavior												
Fraction paid	9%	2%	20%	9%	3%	20%	31%	9%	40%	95%	100%	20%
Minimum payment	$88	$45	$17	$97	$57	$140	$102	$40	$283	$35	$22	$55
Actual payment	$137	$45	$628	$171	$80	$613	$438	$150	$1,297	$1,247	$573	$2,533
Payment:												
< Minimum	6%			7%			15%			2%		
Exact minimum	77%			18%			9%			3%		
Mean minimum	10%			58%			16%			0%		
Intermediate	6%			15%			42%			5%		
Full	2%			2%			19%			90%		
Charged fees:												
Late	7%			9%			13%			3%		
Overlimit	1%			1%			2%			0%		
NSF	0.2%			0%			0.3%			0.1%		
Has past due	6%			7%			14%			1%		

Table A.2
Microdata regressions with account fixed effects.

The table shows difference-in-differences regression estimates for the effect of issuer formula changes on payments using micro data (rather than the collapsed data shown in Table **??**). Panels A and B report pooled estimates for four formula changes that increased the minimum payment, and Panel C reports estimates for one formula change that decreased the minimum payment. Standard errors clustered by issuer formula type interacted with FICO decile are shown in parentheses, and p-values are shown in brackets. Columns 1 and 2 show the average dollar change in minimum payments and the share of delinquent accounts, respectively. Column 3 presents the change in P, the share of accounts paying less than or equal to the higher of the two minimum payment formulas. Columns 4 and 5 present estimates of θ and θ^*, the fraction of anchoring accounts among those directly affected by the formula changes and among all accounts, respectively. Column 6 presents estimates of the share of accounts that pay close to the minimum payment due to liquidity constraints. See text for details. The regressions in Panel A include only time and account fixed effects as independent variables, and includes only treated accounts in the analysis sample. Panels B and C include all accounts from control and treated issuers and a full set of account-level controls and account fixed effects.

	Regression estimates			Anchoring estimates		
	Minimum due	Delinq.	P	θ	θ^*	LC^*
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Positive formula changes, no time-varying controls						
Δ $(t=-1$ to $t=0)$	13.7	0.018	- 0.013	0.07	0.03	0.39
	(0.7)	(0.002)	(0.007)	(0.04)	(0.02)	(0.02)
	[0.0]	[0.000]	[0.057]			
Δ $(t=-1$ to $t=3)$	14.0	0.009	- 0.027	0.15	0.06	0.35
	(0.6)	(0.003)	(0.007)	(0.04)	(0.02)	(0.02)
	[0.0]	[0.004]	[0.000]			
Δ $(t=-1$ to $t=5)$	14.1	0.011	- 0.031	0.17	0.07	0.35
	(0.6)	(0.002)	(0.007)	(0.04)	(0.02)	(0.02)
	[0.0]	[0.000]	[0.000]			
Panel B: Positive formula changes, full controls						
Δ $(t=-1$ to $t=0)$	11.8	0.005	- 0.031	0.17	0.07	0.35
	(0.9)	(0.003)	(0.008)	(0.04)	(0.02)	(0.02)
	[0.0]	[0.150]	[0.000]			
Δ $(t=-1$ to $t=3)$	12.0	0.001	- 0.035	0.19	0.08	0.34
	(1.3)	(0.002)	(0.009)	(0.05)	(0.02)	(0.02)
	[0.0]	[0.500]	[0.000]			
Δ $(t=-1$ to $t=5)$	12.2	0.000	- 0.040	0.22	0.09	0.32
	(1.4)	(0.002)	(0.010)	(0.06)	(0.02)	(0.02)
	[0.0]	[0.940]	[0.000]			
Panel C: Negative formula change, full controls						
Δ $(t=-1$ to $t=0)$	- 30.9	0.004	0.120	0.31	0.16	0.35
	(0.6)	(0.003)	(0.007)	(0.02)	(0.01)	(0.01)
	[0.0]	[0.160]	[0.000]			
Δ $(t=-1$ to $t=3)$	- 32.2	0.006	0.130	0.34	0.17	0.34
	(0.7)	(0.002)	(0.007)	(0.02)	(0.01)	(0.01)
	[0.0]	[0.007]	[0.000]			
Δ $(t=-1$ to $t=5)$	- 35.0	0.000	0.120	0.31	0.16	0.35
	(1.2)	(0.002)	(0.006)	(0.02)	(0.01)	(0.01)
	[0.0]	[0.980]	[0.000]			

Table A.3
Robustness of anchoring estimates.

The table shows difference-in-differences regression estimates for the effects of issuer formula changes on payments in four variations of our main specification. Panel A uses the difference in the minimum payments between the old and new formulas as the treatment variable. Panel B excludes any cards with a promotional interest rate offer. Panels C and D use subsamples of single cardholders and multiple cardholders, respectively. Columns 1 and 2 show the average dollar change in minimum payments and the share of delinquent accounts. Column 3 presents the change in P, the share of accounts paying less than or equal to the higher of the two minimum payment formulas. Columns 4 and 5 present estimates of θ and θ^*, the fraction of anchoring accounts among those directly affected by the formula changes and among all accounts, respectively. Column 6 presents estimates of the share of accounts that pay close to the minimum payment due to liquidity constraints. All regressions include both treated and control issuers and controls for time-varying account characteristics and fixed effects for issuer formula type interacted with FICO decile. Standard errors clustered by issuer formula type interacted with FICO decile are shown in parentheses, and p-values are shown in brackets.

	Regression estimates			Anchoring estimates		
	Minimum due	Delinq.	P	θ	θ^*	LC^*
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Treatment intensity specification						
Δ $(t = -1$ to $t = 5)$	1.230	0.0004	- 0.0019	0.13	0.10	0.36
	(0.130)	(0.0002)	(0.0006)	(0.04)	(0.03)	(0.02)
	[0.000]	[0.0510]	[0.0019]			
Panel B: Exclude promotions						
Δ $(t = -1$ to $t = 5)$	16.3	0.001	- 0.029	0.19	0.08	0.31
	(1.3)	(0.003)	(0.010)	(0.07)	(0.03)	(0.03)
	[0.0]	[0.640]	[0.007]			
Panel C: Single cardholders only						
Δ $(t = -1$ to $t = 5)$	17.0	- 0.011	- 0.041	0.34	0.09	0.17
	(4.7)	(0.007)	(0.011)	(0.09)	(0.02)	(0.02)
	[0.0]	[0.110]	[0.001]			
Panel D: Multiple cardholders only						
Δ $(t = -1$ to $t = 5)$	22.2	0.006	- 0.044	0.25	0.11	0.34
	(2.8)	(0.005)	(0.012)	(0.07)	(0.03)	(0.03)
	[0.0]	[0.230]	[0.001]			