

Online Appendix to:  
“The Marginal Propensity to Consume Over the Business Cycle”

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## A1. Description of the CCP Data

This study uses data from the Consumer Financial Protection Bureau Consumer Credit Panel (CCP). The CCP is a longitudinal panel of de-identified credit records from a major consumer credit reporting agency, representative of all American consumers with a credit report. The full dataset includes snapshots in September of 2001, 2002, and 2003, and the end of each calendar quarter from June 2004 through June 2014. In each snapshot, the CCP includes the complete credit record for each sampled consumer including public records (e.g. bankruptcies, civil judgments, and tax liens), credit inquiries, trade lines, and credit score.<sup>1</sup>

The CCP differs from attribute-based credit bureau data (e.g. the Federal Reserve Bank of New York CCP) in that it provides the exact date at which each trade line was opened, as well as the date on which the trade line was last updated for each snapshot. In addition, the public records portion of the CCP includes the exact filing date and chapter of all of the bankruptcy filings by the consumers in the sample. To create our analysis sample, we collected the complete credit records from each snapshot of every consumer whose record included a Chapter 7 bankruptcy. We restrict our study to Chapter 7 bankruptcies because the removal of Chapter 13 flags are confounded by other changes in the filer’s credit report that occur at the seven-year mark.

To account for the possibility that a given consumer has multiple bankruptcies on their credit record during the sample period, we define the “index bankruptcy” as the first observed bankruptcy for each consumer. While we do not observe the date of bankruptcy adjudication, which typically occurs shortly after filing, we find that flags are almost always removed between 117 and 118 months after the filing date, slightly earlier than the ten years required by the Fair Credit Reporting Act.<sup>2</sup> We define the date of bankruptcy flag removal as 117 months after the filing date for each bankruptcy. We define our sample (the “bankruptcy flag sample”) as all consumers in the CCP whose index bankruptcy was a Chapter 7 filing, and whose flag for the index bankruptcy was removed between 2004 and 2011.<sup>3</sup>

For ease of estimation, we collapse the raw data by bankruptcy filing month and calendar time. As described in Section 3, we collapse the “flow” variables by filing month and calendar month, and the “snapshot in time” variables by filing month and calendar quarter, due to the

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<sup>1</sup> See Avery et al. (2003) for more information on consumer credit records. While the majority of U.S. adults have credit bureau records, the CCP sample differs from the general U.S. population in that younger consumers, minorities, and lower-income consumers are less likely to have credit records. See Brevoort et al. (2015) for more details.

<sup>2</sup> This timing is consistent with the work of Musto (2004), who finds the flag removals occur between 9.5 and 10 years after the discharge date, which is typically on the same day or shortly after the filing date.

<sup>3</sup> Since this sample represents bankruptcy filings between 1994 and 2001, it is unaffected by compositional changes in the filing population caused by the Bankruptcy Abuse Prevention and Consumer Protection Act, which occurred in 2005.

frequency of the underlying data. The flow variables include our primary outcomes of interest: credit card limits and balances on new credit cards opened in each month relative to bankruptcy flag removal. In most of our analysis we restrict to a balanced panel of bankruptcy flag removal “cohorts” (i.e., people experiencing flag removal between 2004 and 2011), tracking outcomes 24 months before and after the flag removal. The 8 years of flag removal translates to 96 flag removal “cohorts”. Restricting to all flag removals observed during this time period with non-missing data yields sample covering 168,812 individuals. We restrict the collapsed data to cover 24 months before and after flag removal, which gives 4,704 “cells” (49 months \* 96 cohorts) for our main results.

The flow variables are indexed by the date of account opening. Specifically, for calendar month  $t$  and individual  $i$ , we take the sum of credit card limits and balances for all new accounts opened in month  $t$ . Since new accounts may take some time to appear on credit reports, we measure the limits and balances on the CCP snapshots closest to the six- and twelve-month marks after the month of account opening. By comparing the six- and twelve-month estimates (and, in unreported results, the 24- and 36-month horizons), we can observe whether the MPC is sensitive to the timing of measurement. As described above, these flow variables are then collapsed across all individuals who file for bankruptcy in a given calendar month. Other flow variables are measured analogously.

The snapshot-in-time variables are constructed slightly differently from the flow variables, and include the existence of a bankruptcy flag, credit score, and the current balance and credit limit on open accounts. We only observe these outcomes at a quarterly level since they are taken directly from the underlying tradeline snapshots in the CCP, which occur on a quarterly basis (as opposed to the more-granular data on date of origination used for flow variables). For example, the credit score for calendar quarter  $t$  and individual  $i$  is simply the score recorded on that snapshot of the CCP. Again, we collapse these variables across individuals who file for bankruptcy in the same calendar month when running our estimation. Since these variables are quarterly instead of monthly, the sample size is cut by one-third, going from 4,704 to 1,568. This sample size is reduced further for credit score analysis (to 1,484) because the credit score “snapshots” are not available every quarter in 2001-2003.

## A2. Description of the Analysis from the Survey of Consumer Finances

We study a sample of about 15,000 former bankruptcy filers surveyed by the Survey of Consumer Finances (SCF). In the 2007, 2009, 2010, 2013, and 2016 waves of the survey, all respondents were asked about their most-recent bankruptcy. We use the answers to that question to calculate the years since bankruptcy, and study characteristics of the former filers captured by the survey.

Unfortunately, there exist several drawbacks to the survey that make this exercise less precise than it otherwise could be. First, respondents were not asked whether their most-recent bankruptcy was a Chapter 7 or Chapter 13 filing. We focus on the ten-year Chapter 7 flag removal, but we cannot exclude former Chapter 13 filers from the analysis. Second, there appears to be “heaping” in the data. Appendix Figure A9 presents a histogram of the (self-reported) years since bankruptcy. A disproportionate share of the SCF filers report having declared bankruptcy ten years ago. Some respondents likely report having declared ten years ago as an approximation, when they do not recall

the precise year that they declared bankruptcy. Third, for the sake of confidentiality, the public-use SCF data rounds each response to the nearest odd number. So the responses that are of particular use to us are 8–9 years since bankruptcy, 10–11 years since bankruptcy, and 11–12 years since bankruptcy.

Those drawbacks aside, we study former bankruptcy filers in the SCF to assess how outcomes change after flag removal. Appendix Table A6 presents a comparison of SCF respondents who are likely responding to the survey just before or just after flag removal. The first two columns compare respondents who report being 8–9 years since bankruptcy versus 10–11 years since bankruptcy; columns 4 and 5 compare respondents who report being 8–9 years since bankruptcy versus 12–13 years since bankruptcy. We rely on that second comparison to avoid the “heaping” at ten years.

The table suggests clear, statistically significant differences in characteristics before and after likely flag removal. Respondents who report being just after likely flag removal are more educated, slightly younger, and higher income. The fact that the survey suggests that fixed characteristics differ before and after likely flag removal suggests caution in using the survey in this way. The drawbacks described above may lead the survey to be entirely problematic for this purpose.

Nevertheless, Appendix Table A7 studies flag removal by presenting a similar comparison but for outcomes that are plausibly a function of flag removal. We regress the outcomes listed in the table on indicator functions for each possible year since bankruptcy, controlling for age, age squared, gender, education, and quartile of income. The baseline group is those who are one year after bankruptcy. We first attempt to replicate a key finding in the main text: there seems to be an increase in the number of credit cards held by SCF respondents after flag removal. That increase is 0.17 for the 8–9-year versus 10–11-year comparison and 0.33 for the 8–9 year versus 12–13 year comparison, both statistically significant at the five-percent level.

The next two rows of the table present the same comparison for credit balances and credit limits. The estimates are of a similar magnitude as what we present in the main text. The implied MPC is roughly 35 percent for the first comparison and 19 percent for the second. Such estimates are smaller than what we present in the main text, but roughly of the same magnitude.

Finally, we study liquid assets. In particular, we create two definitions of liquid assets. The “narrow” definition is the sum of cash, checking and money-market funds. The “broad” definition is cash, checking, money market, stock and bond holdings. We top-code each individual component of liquid assets to the 97.5 percentile. We further top code the total liquid assets at the 97.5 percent again. Using either the narrow definition of liquid assets or the broad definition, we find no statistically significant change after likely flag removal.

### A3. Survey Questions

Thank you very much for participating in this survey.

Please be assured that all of your answers will be completely confidential, and will be used for research purposes only. Therefore, please try to answer these questions as openly and honestly as possible.

We would like to ask you several questions regarding your experience with the financial system and the bankruptcy system. Please do not look up answers to these questions elsewhere before you answer – we would like see what you know right now.

[Click here to view the consent form, opens in new window]

I have read and understand the above consent form, I certify that I am 18 years old or older and, by clicking the submit button to enter the survey, I indicate my willingness voluntarily take part in the study.

[must click "yes" to continue]

1. What is your marital status?
  - [1] Single
  - [2] Married
  - [3] Have partner
2. What is your gender?
  - [1] Male
  - [2] Female
  - [3] Other
3. Which of the following best describes your race or ethnicity? Select all that apply.
  - [1] White
  - [2] Hispanic or Latino
  - [3] Black or African American.
  - [4] Native American or American Indian
  - [5] Asian / Pacific Islander.
  - [6] Other
4. What is the highest level of education that you have completed?
  - [1] Did not complete high school
  - [2] High school graduate
  - [3] Some college, no degree
  - [4] Associate's degree
  - [5] Bachelor's degree
  - [6] Post graduate degree
5. Which of the following best describes your current employment or work status?
  - [1] Self-employed
  - [2] Work part-time for an employer
  - [3] Work full-time for an employer
  - [4] Homemaker
  - [5] Full-time student
  - [6] Permanently sick, disabled, or unable to work
  - [7] Unemployed or temporarily laid off
  - [8] Retired
6. What is your household's approximate annual income, including wages, tips, investment income, public assistance, income from retirement plans, etc.? Would you say it is...
  - [1] Less than \$15,000
  - [2] At least \$15,000 but less than \$25,000
  - [3] At least \$25,000 but less than \$35,000
  - [4] At least \$35,000 but less than \$50,000
  - [5] At least \$50,000 but less than \$75,000
  - [6] At least \$75,000 but less than \$100,000
  - [7] At least \$100,000 but less than \$150,000
  - [8] \$150,000 or more
7. How many times have you filed for bankruptcy in the past?
  - [1] Drop-down menu [0, 1, 2, more than 2]
8. Please enter the details of your most recent bankruptcy filing in questions 1 through 3 below.

- [1] What was the chapter of your most recent bankruptcy filing?
- a) Chapter 7
  - b) Chapter 13
  - c) Other
  - d) Don't know
- [2] What was the year of your most recent bankruptcy filing?
- a) 2017, ..., 2000, before 2000, don't know
- [3] In which state did you file your most recent bankruptcy?
- a) Alabama, ..., Don't know
9. What would you say is your credit score?
- [1] Below 620
  - [2] 620-679
  - [3] 680-719
  - [4] 720-760
  - [5] Above 760
  - [6] Don't know
10. What is the last time you checked or learned about your credit score, or requested a copy of your credit report?
- [1] Less than a month ago
  - [2] Between one and 6 months ago
  - [3] Between 6 and 12 months ago
  - [4] Between 1 and 2 years ago
  - [5] More than 2 years ago
  - [6] I have never checked my credit score or credit report
11. In your opinion, how was your credit score affected by your bankruptcy?
- [1] My score increased by 1-50 points because of my bankruptcy
  - [2] My score increased by 50-100 points because of my bankruptcy
  - [3] My score increased by more than 100 points because of my bankruptcy
  - [4] My credit score was not affected by my bankruptcy
  - [5] My score decreased by 1-50 points because of my bankruptcy
  - [6] My score decreased by 50-100 points because of my bankruptcy
  - [7] My score decreased by more than 100 points because of my bankruptcy
  - [8] Don't know
12. When you apply for a new account, do you think that card companies and other lenders know about your past bankruptcy filing(s)?
- [1] Yes
  - [2] No
  - [3] I Don't Know
13. How long do you think lenders know about your past bankruptcy filing(s)?
- [1] Lenders never know about my past bankruptcy filing
  - [2] Lenders know for 1-6 years after the original bankruptcy filing
  - [3] Lenders know for 7-10 years after the original bankruptcy filing
  - [4] Lenders know for more than 10 years after the original bankruptcy filing, but not forever
  - [5] Lenders know about my past bankruptcy filing forever
  - [6] I don't know
14. Is there a record of your most recent bankruptcy on your credit report today?
- [1] Yes

[2] No

[3] Don't know

15. [If Y to #14] How many more years will your most recent bankruptcy remain on your credit report?

[1] Dropdown menu [1-10, > 10]

[2] Forever

[3] Don't know

16. [If Y to #14] What do you think would happen to your credit score if your bankruptcy were no longer on your credit report?

[1] My credit score would increase by 1-50 points

[2] My credit score would increase by more than 50 points

[3] My credit score would not change

[4] My credit score would decrease by 1-50 points

[5] My credit score would decrease by more than 50 points

[6] Don't know

17. [If Y to #14] What do you think would happen to your likelihood of getting approved for a new credit card if your bankruptcy were no longer on your credit report?

[1] My likelihood of getting a new credit card would increase substantially

[2] My likelihood of getting a new credit card would increase a little

[3] My likelihood of getting a new credit card would not change

[4] My likelihood of getting a new credit card would decrease substantially

[5] My likelihood of getting a new credit card would decrease a little

[6] Don't know

18. If you needed to, do you think you would be legally allowed to file for Chapter 7 bankruptcy this year?

[dropdown menu: yes, no, don't know]

19. If you needed to, do you think you would be legally allowed to file for Chapter 13 bankruptcy this year?

[dropdown menu: yes, no, don't know]

20. During the last twelve months, did you do any of the following?

	Yes	No
Apply for a credit card	<input type="checkbox"/>	<input type="checkbox"/>
Apply for a mortgage or home-based loan	<input type="checkbox"/>	<input type="checkbox"/>
Apply for an auto loan	<input type="checkbox"/>	<input type="checkbox"/>
Request an increase in the credit limit of a credit card	<input type="checkbox"/>	<input type="checkbox"/>
Request an increase in the limit of an existing loan	<input type="checkbox"/>	<input type="checkbox"/>
Request to refinance your mortgage	<input type="checkbox"/>	<input type="checkbox"/>
Apply for a student loan	<input type="checkbox"/>	<input type="checkbox"/>

**[If respondent says no to all options in the previous question go to the next question]**

21. You just indicated that you did not apply for any new loans or credit cards over the past twelve months, nor did you make any request for an increase in limits, or refinancing. What is the reason for that?

- [1] I was satisfied with my current financial situation, and had no additional need
- [2] Too time consuming, and not worth the benefits
- [3] Borrowing rates were too high
- [4] I do not know how to go about doing any of these
- [5] I did not think I would get approved

22. On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your overall financial knowledge?

23. Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

- [1] More than \$102
- [2] Exactly \$102
- [3] Less than \$102
- [4] Don't know

24. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

- [1] More than today
- [2] Exactly the same
- [3] Less than today
- [4] Don't know

25. If interest rates rise, what will typically happen to bond prices?

- [1] They will rise
- [2] They will fall
- [3] They will stay the same
- [4] There is no relationship between bond prices and the interest rate
- [5] Don't know

26. True or false: A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest over the life of the loan will be less.

- [1] True
- [2] False
- [3] Don't know

27. True or false: Buying a single company's stock usually provides a safer return than a stock mutual fund.

- [1] True
- [2] False
- [3] Don't know

28. For data verification purposes we would like to ask your first and last name. Your name will be kept confidential, will only be used for research purposes, and will not be shared with any outside parties. Answering this question is optional.

First name:

Last name:

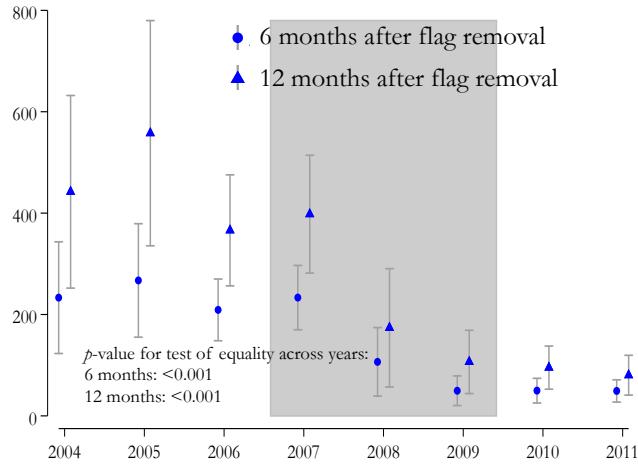
## **A4. Appendix Tables and Figures**

Additional tables and figures follow.

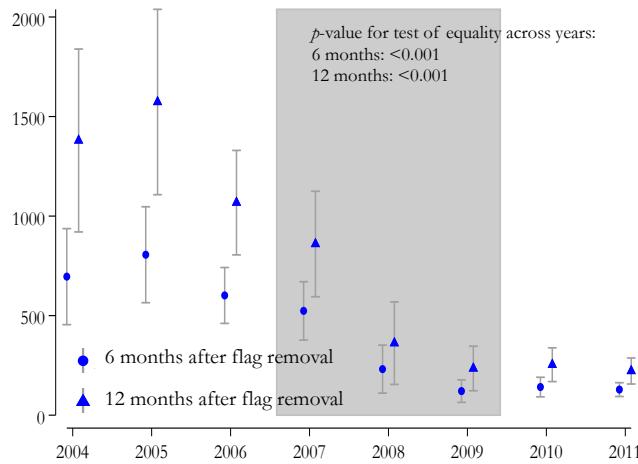
### Appendix Figure A1. Components of the MPC Over the Business Cycle

This figure plots the numerator and denominator of the estimated marginal propensity to consume by year. The shaded regions indicate the Great Recession.

A. Credit Card Balances



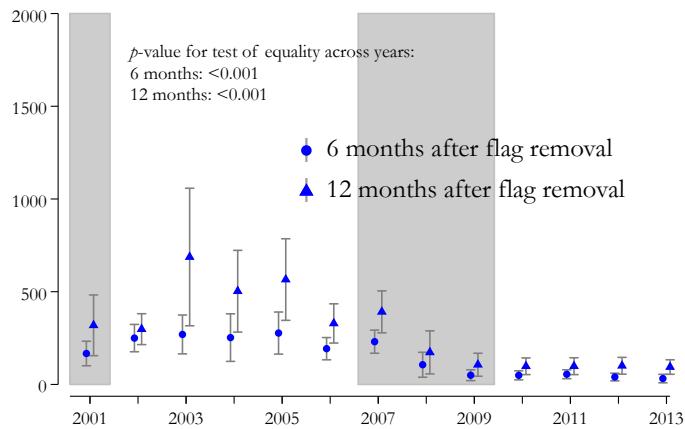
B. Credit Card Limits



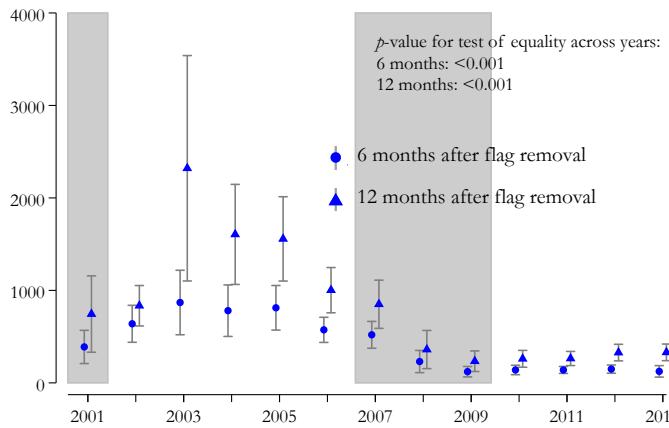
## Appendix Figure A2. Components of the MPC for the Extended Time Series

This figure is based on an alternative sample that includes flag-removal cohorts from 2001 through 2013. These estimates are based on a two-year pre and post window for each cohort, or the widest window possible in the dataset. The figure plots the numerator and denominator of the estimated marginal propensity to consume by year. The shaded regions indicate recessions.

A. Credit Card Balances



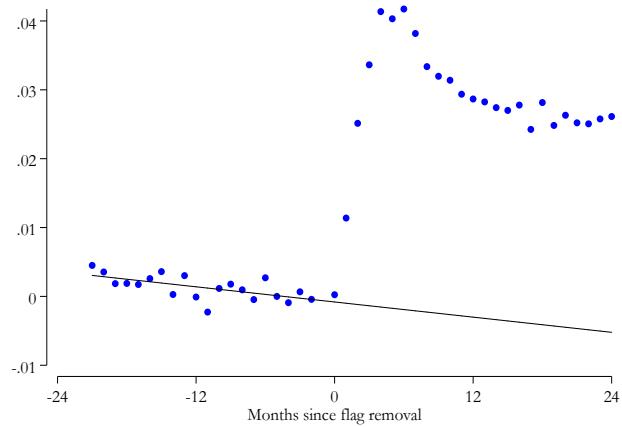
B. Credit Card Limits



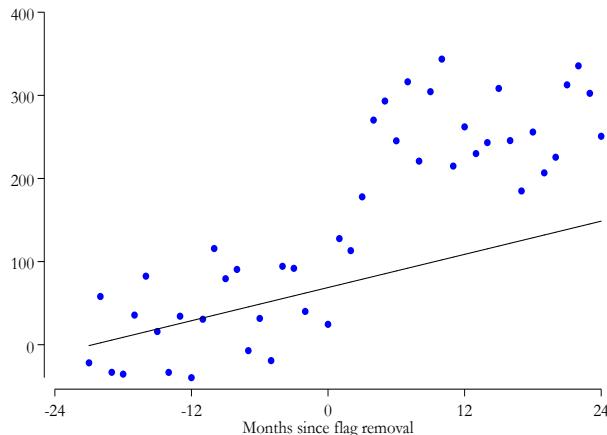
**Appendix Figure A3. Effect of Bankruptcy Flag Removal  
on Summary Outcomes**

The circular markers in the figure plot the estimated effects of event time, controlling for calendar year-month and flag-removal cohort. Time periods -24, -23, and -22 are restricted to have same point estimate; time period -1 is omitted. The solid line is an OLS regression line fit to all pre-period event-study estimates.

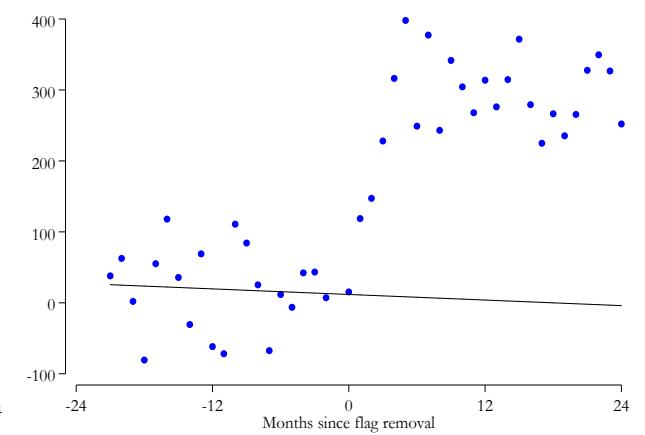
A. Number of New Accounts



B. Balances on New Accounts



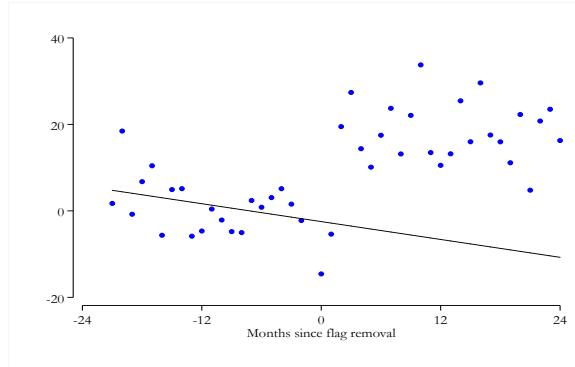
C. Principal and Limits on New Accounts



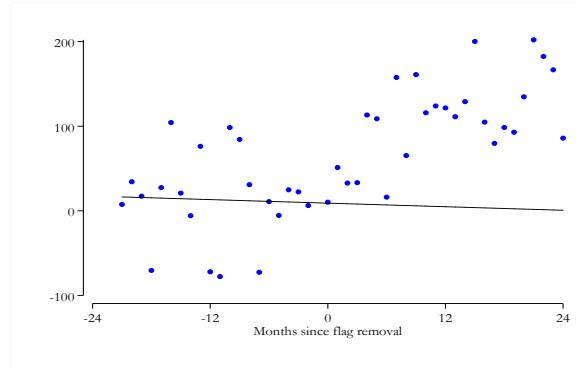
### Appendix Figure A4. Effect of Bankruptcy Flag Removal on Auto Loans and Mortgages

The circular markers in the figure plot the estimated effects of event time, controlling for calendar year-month and flag-removal cohort. Time periods -24, -23, and -22 are restricted to have same point estimate; time period -1 is omitted. The solid line is an OLS regression line fit to all pre-period event-study estimates.

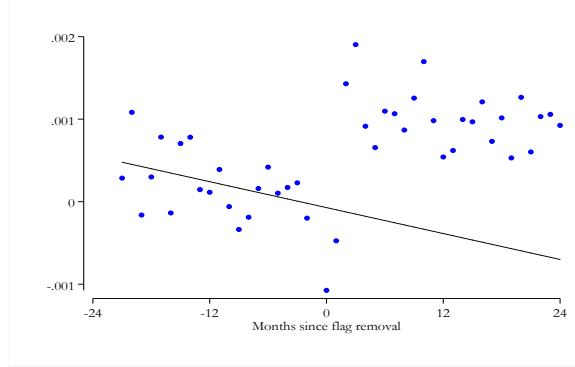
A. Principal on New Auto Accounts



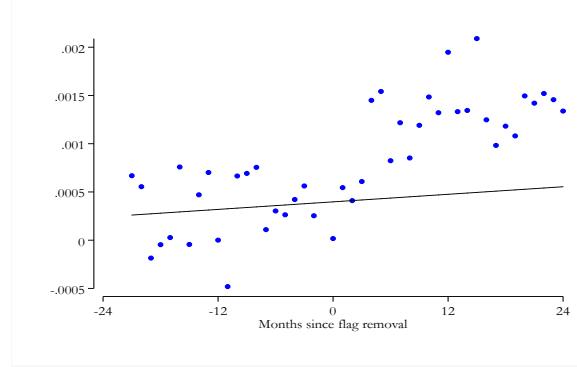
B. Principal on New Mortgage Accounts



C. Number of New Auto Accounts



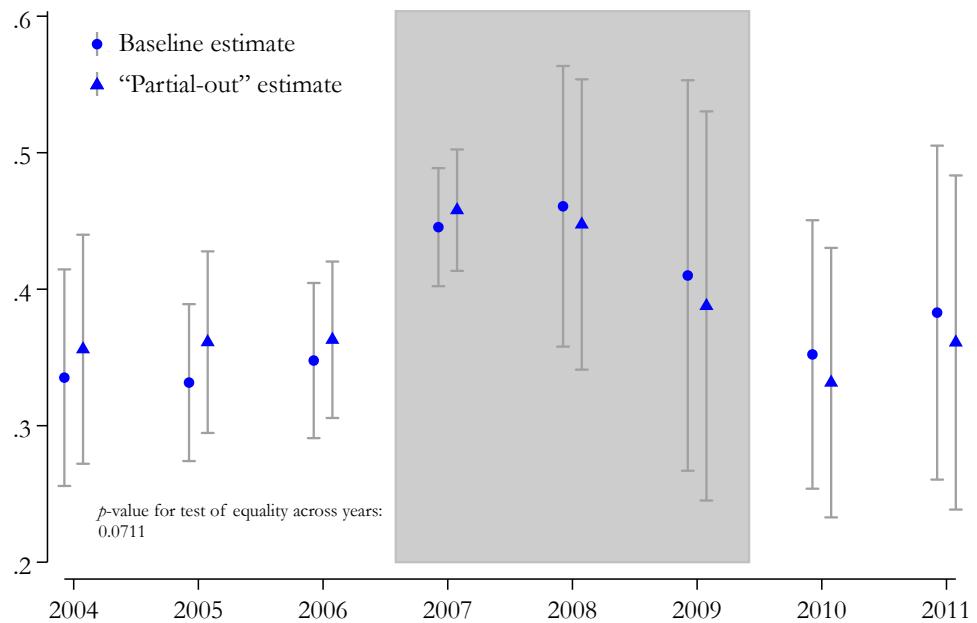
D. Number of New Mortgage Accounts



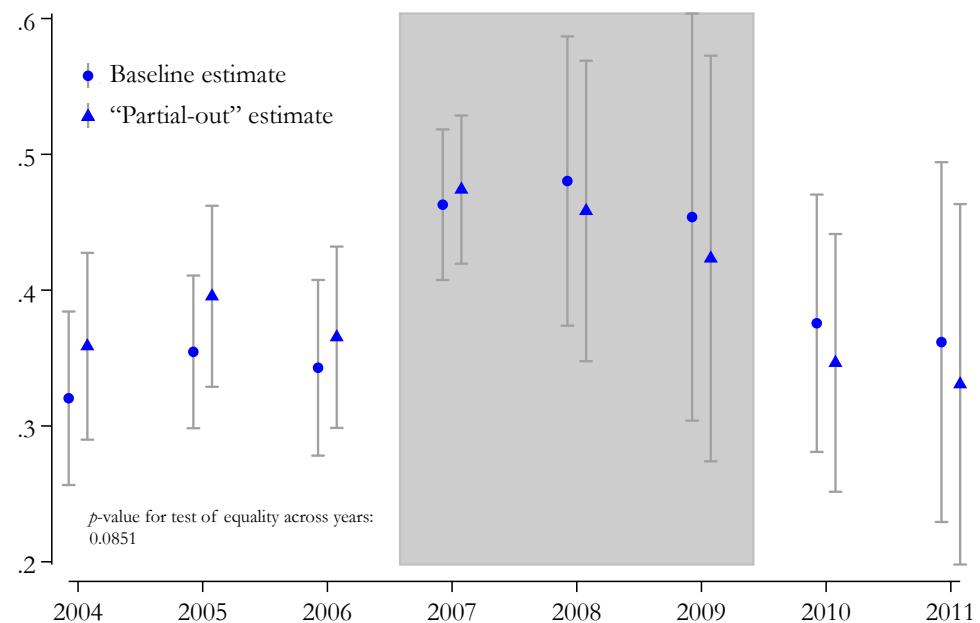
### Appendix Figure A5. Robustness of the MPC to Partialling Out Credit Limits

These figures present estimated MPC out of liquidity by year, adjusting for changes over time in the effect of flag removal on credit limits. See text for details.

A. 6-Month Estimates



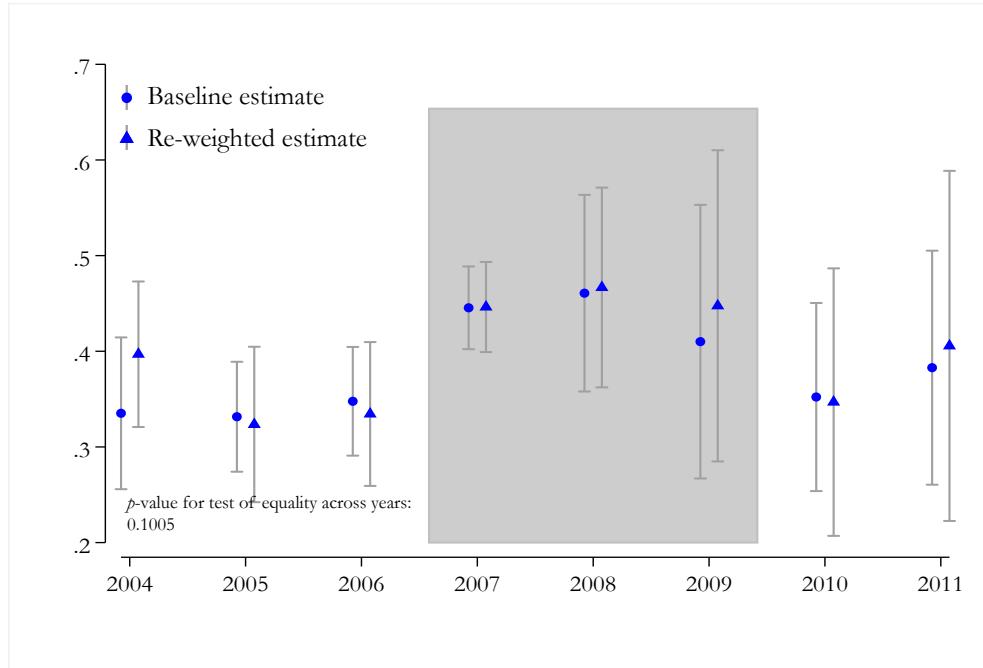
B. 12-Month Estimates



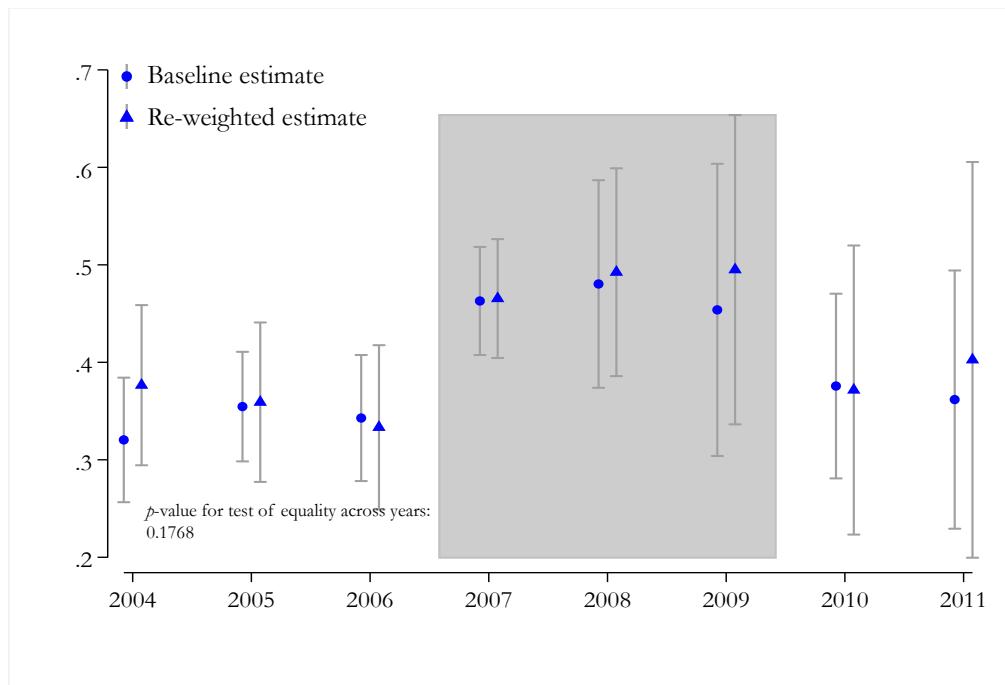
### Appendix Figure A6. Re-weighting to Match 2008 Characteristics

These figures present estimated MPC out of liquidity by year once the sample each year has been re-weighted to match the financial characteristics of those who have bankruptcy flags removed in 2008. See text for details.

A. 6-Month Estimates



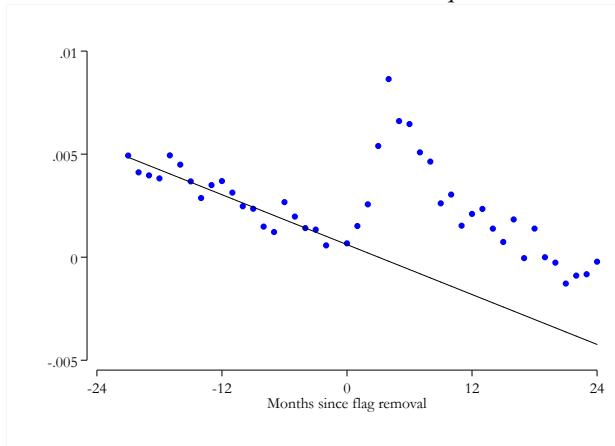
B. 12-Month Estimates



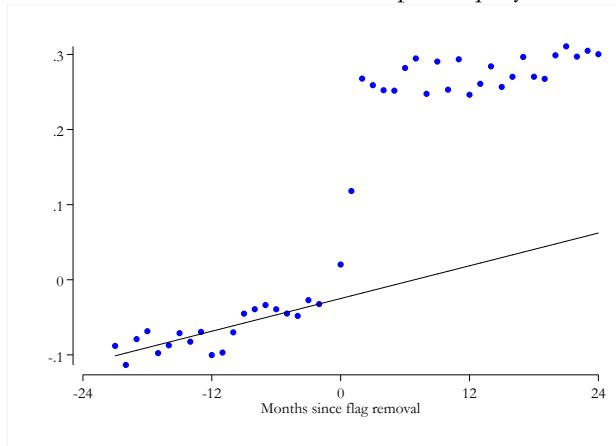
### Appendix Figure A7. Effect of Bankruptcy Flag Removal on Inquiries and New Trades per Inquiry

The circular markers in the figure plot the estimated effects of event time, controlling for calendar year-month and flag-removal cohort. Time periods -24, -23, and -22 are restricted to have same point estimate; time period -1 is omitted. The solid line is an OLS regression line fit to all pre-period event-study estimates.

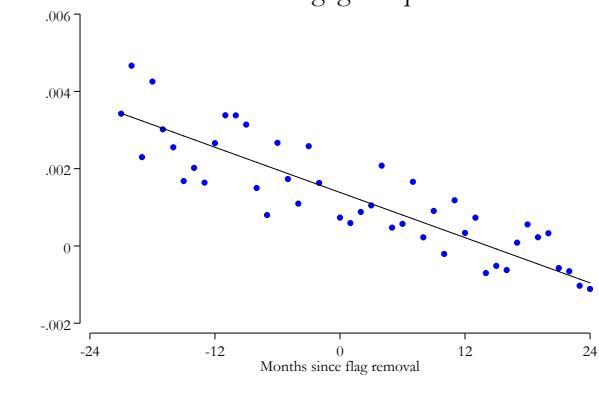
A. Credit Card Inquiries



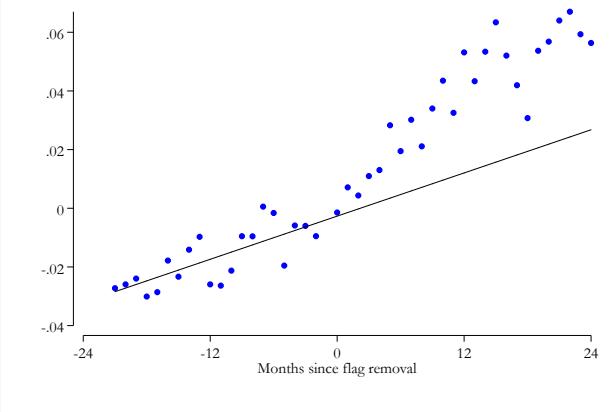
B. Credit Card Trades per Inquiry



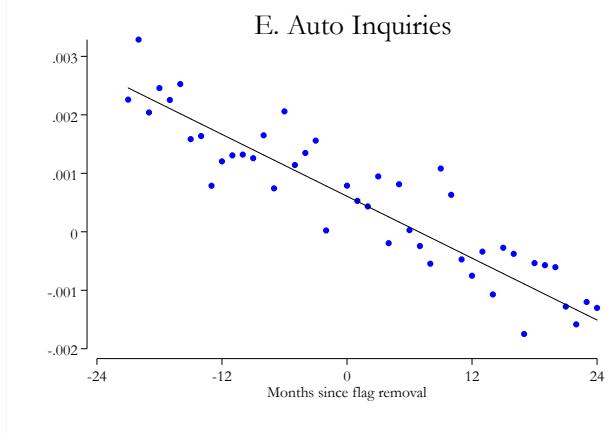
C. Mortgage Inquiries



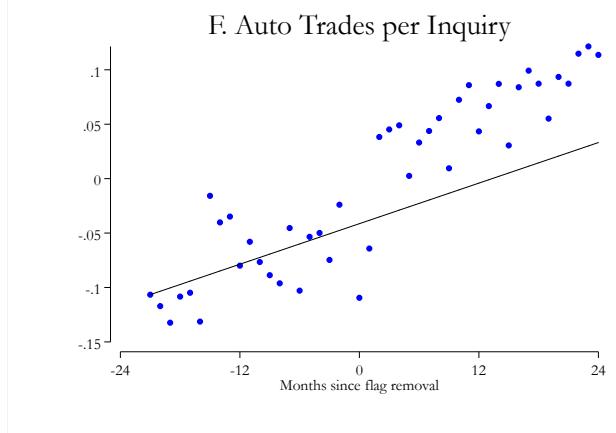
D. Mortgage Trades per Inquiry



E. Auto Inquiries



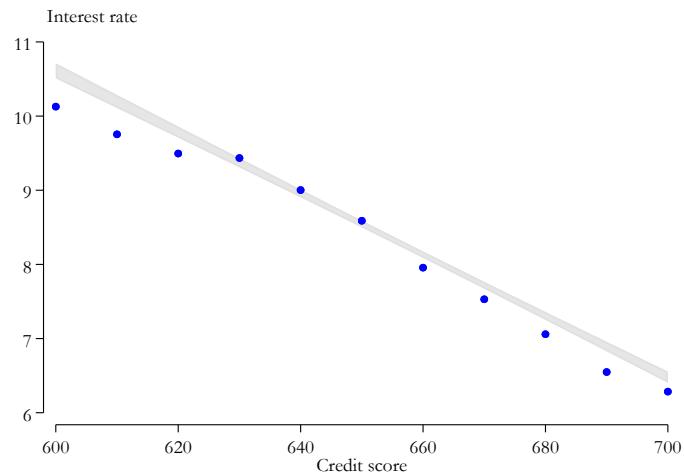
F. Auto Trades per Inquiry



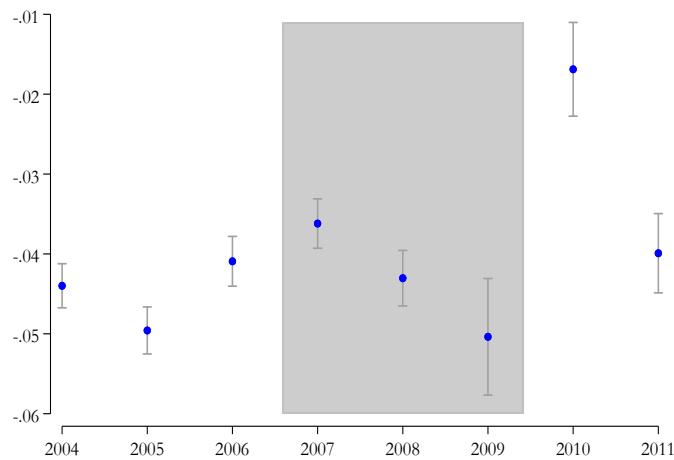
### Appendix Figure A8. The Relationship Between Credit Score and Interest Rate

These figures describe the association between credit score and interest rate, overall and by year. The figures are based on data from Mintel Comperemedia. We restrict the sample to credit cards offered to consumers with credit scores between 600 and 700. We compute the interest rate as the weighted average of the introductory APR and regular APR, weighted by the fraction of the first year since account opening that each interest rate applies. Figure A plots the APR offered to consumers against their credit score. Figure B plots the slope of that relationship across years.

A. Pooled Years Between 2004 and 2011

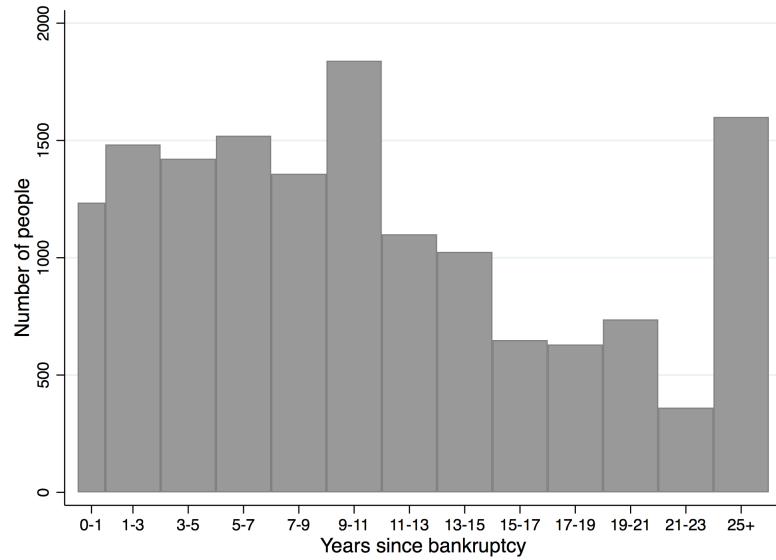


B. Separate Estimates by Year



### **Appendix Figure A9. Distribution of Years Since Bankruptcy in the Survey of Consumer Finances**

This figure describes the distribution of self-reported years since most-recent bankruptcy in the 2007, 2009, 2010, 2013, and 2016 waves of the Survey of Consumer Finances.



### Appendix Table A1. Summary Statistics

This table presents summary statistics for Chapter 7 bankruptcy filers whose flags are removed between 2004 and 2011 alongside sample statistics for a one-percent random sample of the CCP data. For the bankruptcy flag sample, the table summarizes characteristics in the quarter preceding flag removal.

	Mean for bankruptcy flag sample	Mean for a 1-percent sample of the CCP
Total number of bankruptcies	1.3	0.1
Chapter 7	1.2	0.1
Chapter 13	0.1	0.0
Summary credit characteristics		
Credit score	616	696
# of open accounts	4.8	5.3
Balances on open accounts	\$76,348	\$72,823
Credit card balance	\$3,720	\$4,142
Mortgage balance	\$56,575	\$53,918
Auto balance	\$6,656	\$4,068
Other credit balance	\$9,397	\$10,696
Principal and limits on open accounts	\$85,457	\$98,861
Credit card limits	\$8,170	\$20,732
Mortgage principal	\$55,688	\$55,151
Auto principal	\$9,835	\$6,304
Other principal and limits	\$11,451	\$16,358
Inquiries and delinquency		
# credit inquiries per quarter	0.5	0.3
# collections inquiries per quarter	0.04	0.02
Balance on collections trades	\$31	\$10
Delinquency rate on new trades	0.07	0.04
Delinquency rate on open trades	0.04	0.02

**Appendix Table A2. MPC Stratified by Additional Variables**

This table presents estimates of the MPC out of liquidity for groups of consumers stratified by whether they have low, medium, or high levels of credit card balance, limit, and credit line (limit minus balance). See notes to Table 4 for how MPC is calculated. Mean balance for the 3 groups in Panel A are: \$0, \$1,014, and \$8,069. Mean limits for the 3 groups in Panel B are: \$0.21, \$1,769, and \$14,705. Mean credit lines for the 3 groups in Panel C are: -\$365, \$213, and \$8,720.

	(1) Low	(2) Medium	(3) High
<b>A. Stratified by Balance</b>			
6-month effect	0.294 (0.038) [0.000]	0.351 (0.018) [0.000]	0.418 (0.017) [0.000]
12-month effect	0.318 (0.032) [0.000]	0.346 (0.016) [0.000]	0.420 (0.016) [0.000]
<b>B. Stratified by Limit</b>			
6-month effect	0.384 (0.039) [0.000]	0.387 (0.017) [0.000]	0.373 (0.015) [0.000]
12-month effect	0.372 (0.031) [0.000]	0.407 (0.016) [0.000]	0.367 (0.015) [0.000]
<b>C. Stratified by Credit Line</b>			
6-month effect	0.510 (0.115) [0.000]	0.440 (0.019) [0.000]	0.338 (0.015) [0.000]
12-month effect	0.532 (0.085) [0.000]	0.445 (0.017) [0.000]	0.336 (0.015) [0.000]

**Appendix Table A3. Effect of Bankruptcy Flag Removal  
on New Accounts**

Each point estimate represents the change in each outcome per 10-point change in credit score. This is calculated by dividing the reduced-form effect of flag removal on the outcome by the effect of flag removal on credit score. The effects are estimated jointly by Seemingly Unrelated Regression, and the standard errors in parentheses are clustered on bankruptcy-flag cohort and calculated using the delta method; associated  $p$ -values in brackets. The underlying regressions include a linear trend in the number of months until flag removal, indicator variables for the 24 months after flag removal, a fixed effect for year-month flag removal cohort, and a fixed effect for each calendar month.

	(1) All	(2) Mortgage	(3) Auto	(4) Other
<b>A. Number of new accounts</b>				
6-month effect	0.132 (0.010) [0.000]	0.002 (0.001) [0.017]	0.003 (0.001) [0.004]	0.028 (0.003) [0.000]
12-month effect	0.252 (0.019) [0.000]	0.007 (0.002) [0.000]	0.007 (0.002) [0.000]	0.056 (0.006) [0.000]
Pre-removal mean stock	4.789	0.385	0.491	1.083
<b>B. Balances on new accounts</b>				
6-month effect	489 (140) [0.000]	155 (122) [0.204]	40 (16) [0.014]	141 (44) [0.001]
12-month effect	1140 (258) [0.000]	473 (231) [0.041]	99 (30) [0.001]	276 (72) [0.000]
Pre-removal mean	71,397	52,978	6,282	8,904
<b>C. Principal and limits on new accounts</b>				
6-month effect	927 (170) [0.000]	195 (135) [0.146]	53 (20) [0.008]	269 (77) [0.000]
12-month effect	2000 (315) [0.000]	609 (262) [0.020]	132 (36) [0.000]	487 (127) [0.000]
Pre-removal mean	81,061	53,030	9,302	10,782

**Appendix Table A4. Long-Run Effects of Bankruptcy Flag Removal**

This table presents estimates of the effect of flag removal on the given outcomes in the long run. The underlying regressions are identical to those of Table 2 (for column 1) or Table 3 (for other columns), but with up to 60 months of post-bankruptcy-flag-removal data included. Standard errors in parentheses clustered on flag-removal cohort, associated  $p$ -values in brackets.

	(1) Credit Score	(2) Delinq Rate	(3) MPC	(4) Card Limits	(5) Card Balances	(6) Mortgage Principal	(7) Auto Principal
12-month effect	16.381 (0.540) [0.000]	0.000 (0.001) [0.624]	0.373 (0.011) [0.000]	750 (63) [0.000]	279 (25) [0.000]	569 (374) [0.128]	170 (43) [0.000]
24-month effect	17.352 (0.522) [0.000]	0.000 (0.001) [0.730]	0.372 (0.014) [0.000]	1243 (113) [0.000]	462 (45) [0.000]	1208 (878) [0.169]	361 (94) [0.000]
36-month effect	17.767 (0.605) [0.000]	0.000 (0.001) [0.797]	0.378 (0.018) [0.000]	1654 (175) [0.000]	625 (72) [0.000]	1969 (1573) [0.211]	587 (168) [0.000]
48-month effect	17.823 (0.669) [0.000]	0.000 (0.001) [0.739]	0.387 (0.023) [0.000]	2040 (241) [0.000]	789 (102) [0.000]	2811 (2457) [0.253]	814 (259) [0.002]
60-month effect	18.123 (0.749) [0.000]	- 0.001 (0.001) [0.354]	0.399 (0.028) [0.000]	2370 (333) [0.000]	945 (144) [0.000]	3761 (3497) [0.282]	1081 (372) [0.004]
Pre-removal mean stock	616	0.040	-	8,182	3,685	55,555	9,809

**Appendix Table A5. Effect of Bankruptcy Flag Removal on Inquiries and Trades Per Inquiry**

Each point estimate represents the change in each outcome per 10-point change in credit score. This is calculated by dividing the reduced-form effect of flag removal on the outcome by the effect of flag removal on credit score. The effects are estimated jointly by Seemingly Unrelated Regression, and the standard errors in parentheses are clustered on bankruptcy-flag cohort and calculated using the delta method; associated  $p$ -values in brackets. The underlying regressions include a linear trend in the number of months until flag removal, indicator variables for the 24 months after flag removal, a fixed effect for year-month flag removal cohort, and a fixed effect for each calendar month.

	(1) All	(2) Cards	(3) Mortgage	(4) Auto	(5) Other
<b>A. Number of inquiries</b>					
6-month effect	0.033 (0.008) [0.000]	0.021 (0.002) [0.000]	0.000 (0.003) [0.958]	0.001 (0.001) [0.561]	0.004 (0.001) [0.004]
12-month effect	0.067 (0.022) [0.002]	0.037 (0.004) [0.000]	0.002 (0.005) [0.711]	0.002 (0.003) [0.580]	0.007 (0.002) [0.002]
Pre-removal mean per quarter	0.475	0.186	0.151	0.061	0.077
<b>B. Trades per inquiry</b>					
6-month effect	0.126 (0.012) [0.000]	0.184 (0.020) [0.000]	0.010 (0.007) [0.182]	0.030 (0.020) [0.135]	0.246 (0.042) [0.000]
12-month effect	0.095 (0.011) [0.000]	0.139 (0.018) [0.000]	0.025 (0.008) [0.001]	0.021 (0.021) [0.323]	0.151 (0.037) [0.000]
Pre-removal mean	0.920	1.184	0.234	0.880	1.705

**Appendix Table A6. Comparison of Characteristics in the SCF**

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This table presents means and comparisons of means based on former bankruptcy filers in the SCF.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	8–9 years from bankruptcy	10–11 years from bankruptcy	Difference	8–9 years from bankruptcy	12–13 years from bankruptcy	Difference
Age	52.33	50.68	-1.65 ***	52.33	51.94	-0.39
female	32.20%	28.50%	-3.71% **	32.20%	25.39%	-6.81% ***
Education: less than high school	10.70%	10.89%	0.18%	10.70%	19.33%	8.63% ***
Education: high school	71.42%	64.98%	-6.44% ***	71.42%	57.93%	-13.48% ***
Education: college degree	12.02%	15.61%	3.59% ***	12.02%	18.61%	6.58% ***
Education: graduate degree	5.86%	8.52%	2.67% ***	5.86%	4.13%	-1.73% **
N	1,358	1,840		1,358	1,100	

**Appendix Table A7. Effect of Bankruptcy Flag Removal in the SCF**

This table presents estimates from a regression of the given outcomes on an indicator function for every possible bin of years since bankruptcy in the SCF. The excluded group consists of respondents to the survey who are one year from bankruptcy. Controls include age, age squared, gender, education level, and quartile of income. All variables except for number of credit cards are in nominal dollars. Robust standard errors in parentheses, associated  $p$ -values in brackets.

	(1)	(2)	(3)	(4)	(5)	(6)
	8–9 years from bankruptcy	10–11 years from bankruptcy		8–9 years from bankruptcy	12–13 years from bankruptcy	
Number of credit cards	0.78 (0.08) [0.00]	0.95 (0.07) [0.00]	0.17 (0.09) [0.05]	0.78 (0.08) [0.00]	1.12 (0.08) [0.00]	0.33 (0.09) [0.00]
Credit balances	716.27 (186.73) [0.00]	974.40 (178.27) [0.00]	258.13 (182.85) [0.16]	716.27 (186.73) [0.00]	1268.74 (212.15) [0.00]	552.48 (215.94) [0.01]
Credit limits	3535.01 (460.42) [0.00]	4275.83 (490.01) [0.00]	740.82 (498.60) [0.14]	3535.01 (460.42) [0.00]	6403.56 (564.16) [0.00]	2868.55 (565.32) [0.00]
Liquid assets (narrow)	733.03 (115.99) [0.00]	588.41 (97.55) [0.00]	-144.62 (122.79) [0.24]	733.03 (115.99) [0.00]	701.16 (111.54) [0.00]	-31.88 (133.35) [0.81]
Liquid assets (broad)	828.35 (129.14) [0.00]	669.96 (113.67) [0.00]	-158.39 (132.41) [0.23]	828.35 (129.14) [0.00]	835.45 (135.25) [0.00]	7.09 (150.70) [0.96]