

Delinquency Puzzle

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May 2024

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Puzzling Observation

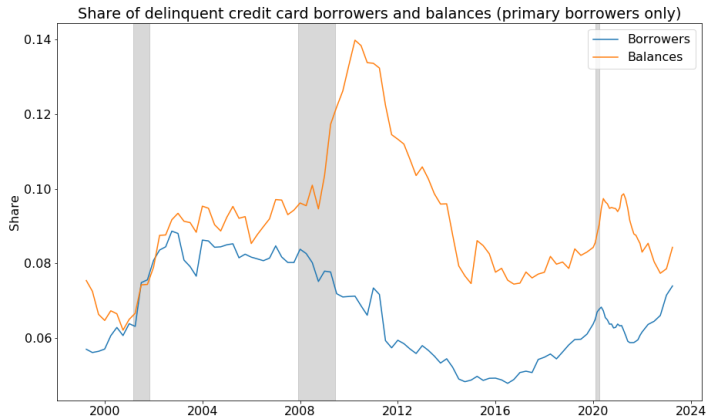
- Delinquency rate of credit card **balances** is counter-cyclical
 - Not surprising
 - Consistent with cyclicalities of charge-off rates and bankruptcies
- But delinquency rate of credit card **borrowers** is almost acyclical
 - Very surprising

Puzzling Observation

- Delinquency rate of credit card **balances** is counter-cyclical
 - Not surprising
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- But delinquency rate of credit card **borrowers** is almost acyclical
 - Very surprising
- Primary data source: FRBNY Consumer Credit Panel/Equifax (CCP)
 - Anonymized credit records of 5% of Americans with credit records
 - Additionally, BLS for unemployment and SLOOS for lending standards
 - Census data for median income of neighborhoods (census tracts)
- What does that tell us?
 - about the nature of business cycle shocks?
 - about households' ability to weather them?
 - and about credit markets' response to them?

The Puzzle

- Delinquency rate as share of balances spikes in the Great Recession
- Delinquency rate as share of borrowers is flat (or declining)



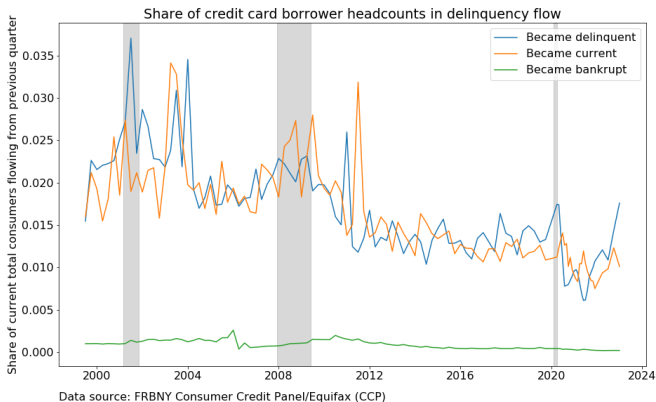
Note: Borrowers is share of delinquent borrowers / total borrowers in CCP. Balances is share of total delinquent bankcard balance / total bankcard balance.

Possible Explanations (Mechanical)

- Do borrowers stay delinquent longer accumulating larger balances?
- Extensive margin: Fewer people get credit cards in recession
- Different types of borrowers become delinquent in recessions
 - Consistent with changes in characteristics of bankruptcy filers documented in Fieldhouse et al (2012)
 - Reflecting “middle-class” being affected by the Great Recession
- Same borrowers become delinquent on more cards or larger balances

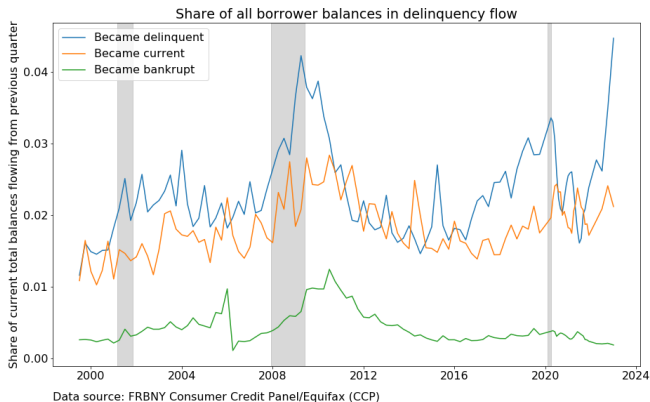
Flows paint the same picture as stocks

- Flows of borrowers into delinquency are flat. . .



Flows paint the same picture as stocks

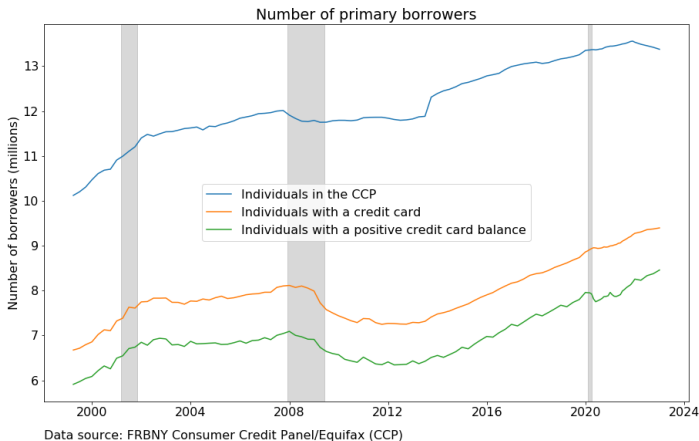
- ... while the flows of balances into delinquency spikes in recession



Extensive margin: Lending standards?

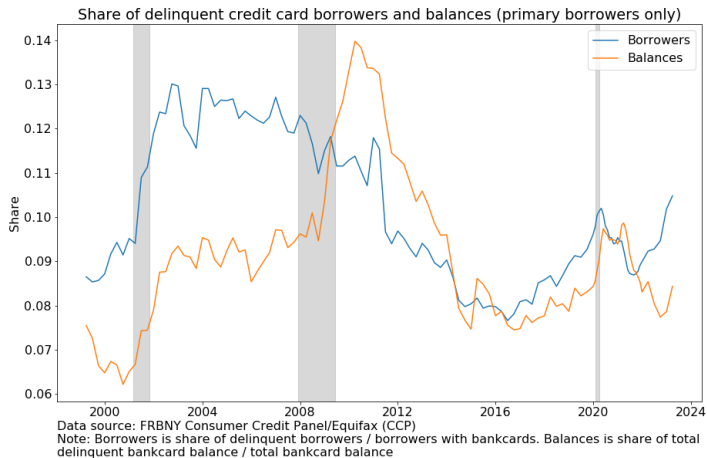
Is this driven by changes in lending standards?

- Are there simply fewer people with credit cards in recessions?



The Puzzle

Restricting the sample to borrowers with credit cards does not resolve the puzzle



Do different borrowers default in recession?

Questions:

- Do delinquent borrowers look systematically different over the cycle?
- Do these changes account for the puzzle?

Answers:

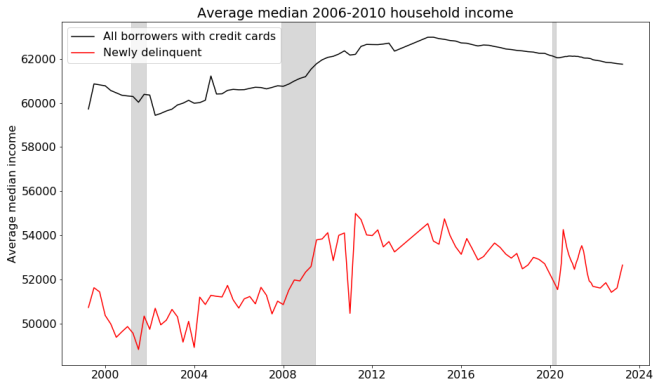
- Yes
 - Delinquents are richer in recessions
 - and more likely to be homeowners
- Not completely

Remaining puzzle:

- Why aren't more (poor) people going delinquent?

Do different borrowers default in recession?

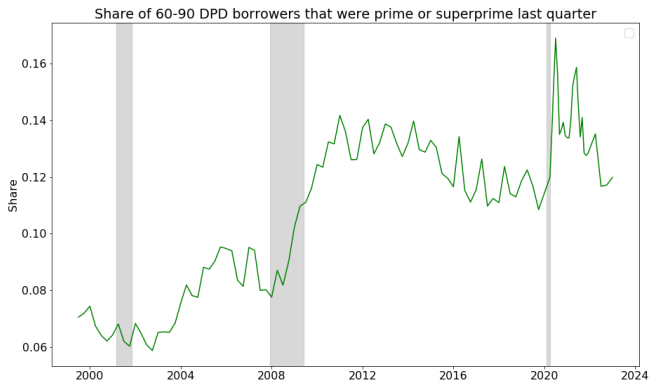
- Newly delinquent borrowers live in (slightly) richer neighborhoods



Data source: FRBNY Consumer Credit Panel/Equifax (CCP), U.S. Census Bureau
Note: Median income is estimated using tract level income data from the Census Bureau.

Do different borrowers default in recession?

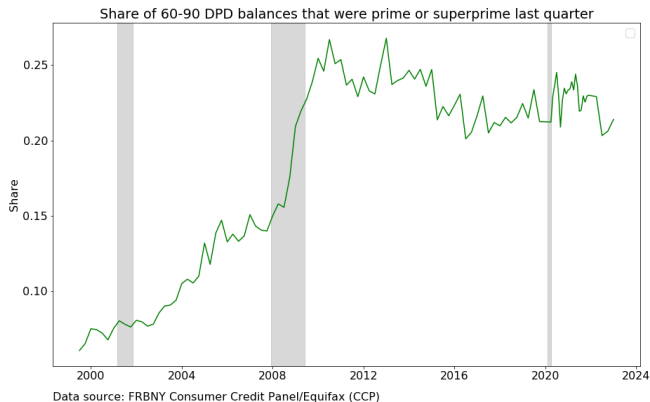
- Newly delinquent borrowers are more likely to come from “prime” population during recessions
 - Surprisingly, there is no reversal during expansions



Data source: FRBNY Consumer Credit Panel/Equifax (CCP)

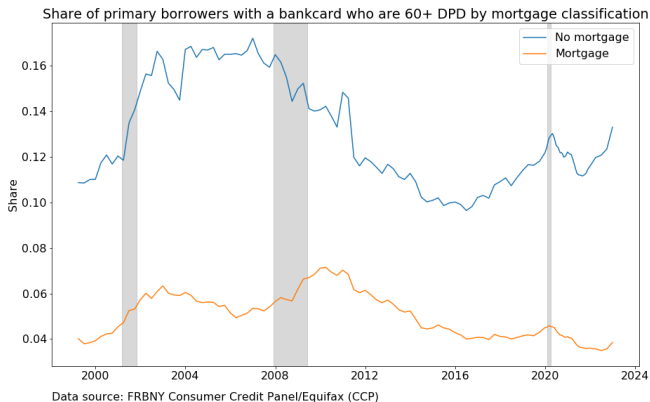
Do different borrowers default in recession?

- Newly delinquent borrowers are more likely to come from “prime” population during recessions
- Both in headcounts and in balances



Do different borrowers default in recession?

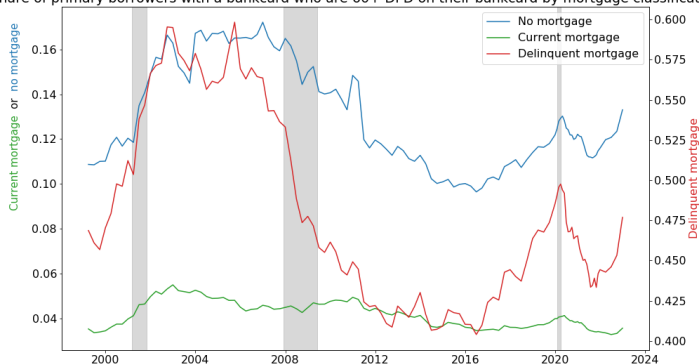
- Newly delinquent borrowers are more likely to be homeowners (mortgagors) during recession



Why do homeowners default more in recession?

- The change in homeowners' defaults on credit cards is entirely “accounted for” by their defaults on mortgages

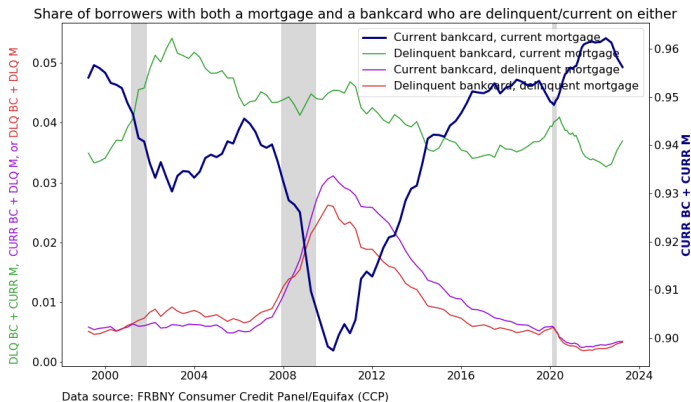
Share of primary borrowers with a bankcard who are 60+ DPD on their bankcard by mortgage classification



Data source: FRBNY Consumer Credit Panel/Equifax (CCP)

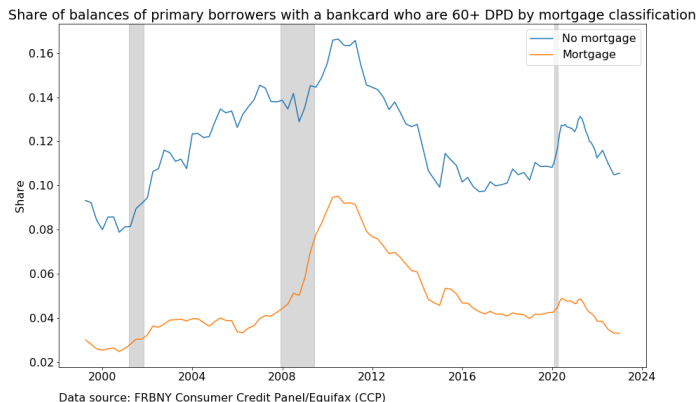
Zooming In On Homeowners

- Great Recession generated a spike in mortgage delinquencies
- Some, but not all, of those paired with credit card delinquencies
 - Evidence of strategic mortgage default?



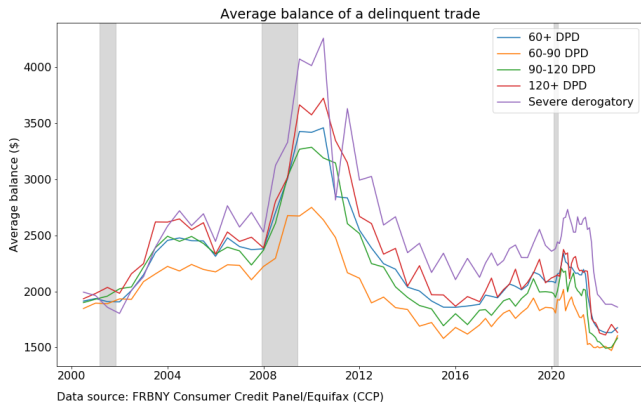
Do different borrowers default in recession?

- Note that the basic puzzle holds for each category, especially non-mortgagors



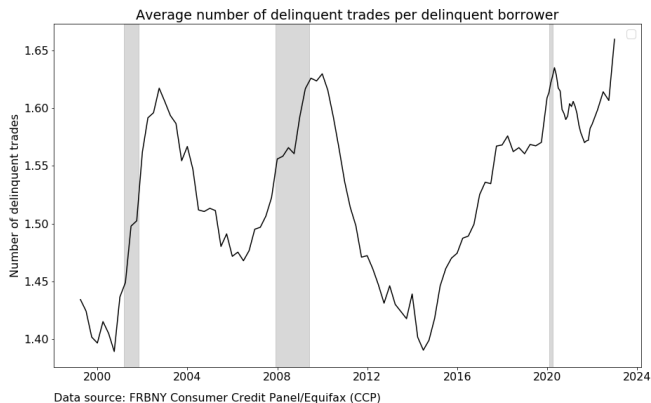
Depth of Delinquency

- Borrowers default on larger balances during recession



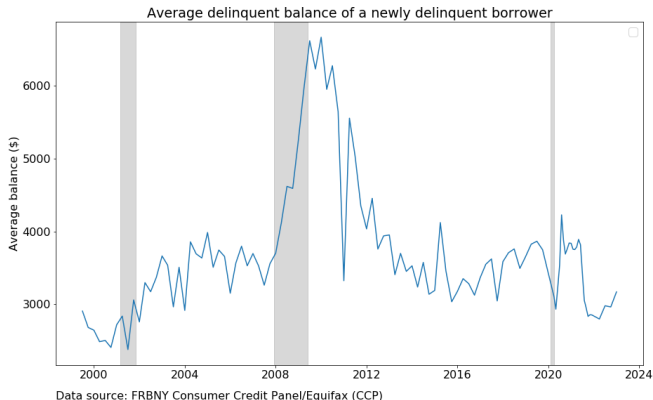
Depth of Delinquency

- Larger delinquent balances are due in part to more “universal” default
- But while avg delinquent balance was up 40% in the Great Recession, the number of delinquent cards per delinquent was up less than 10%



Larger inflow or slower outflow?

- The fluctuations in the newly-delinquent balances (inflow) are larger than those in the stock of delinquent balances



County-Level Analysis

The remainder of the slides are newly approved by our data manager, and thus barely seen by the discussant.

- Basic idea: Use cross-country variation in the severity of recession to learn more about underlying mechanisms

The remainder of the slides are based on the following data:

- delinquency statistics from FRBNY Consumer Credit Panel/Equifax Data (CCP) aggregated to county level,
- unemployment data from the U.S. Bureau of Labor Statistics (BLS),
- net share of banks tightening lending standards from Senior Loan Officer Opinion Survey (SLOOS) on Bank Lending Practices from the Board of Governors of the Federal Reserve System.

County-Level Analysis: "Renters"

Delinquency stock: Non-mortgagor **headcount** share of CCP consumers regressions, 1999-2019

	(1)	(2)	(3)	(4)
County unemployment rate	0.08*** (0.00)	0.08*** (0.00)	-0.03*** (0.00)	0.08*** (0.01)
National unemployment rate	-0.12*** (0.00)	-0.14*** (0.00)		0.96*** (0.02)
Net share of banks tightening lending standards		0.03*** (0.00)	0.03*** (0.00)	0.01*** (0.00)
Lag county unemployment rate				-0.00 (0.00)
Lag national unemployment rate				-1.13*** (0.02)
Lag Net share of banks tightening lending standards				0.00*** (0.00)
Constant	0.08*** (0.00)	0.08*** (0.00)	0.08*** (0.00)	0.08*** (0.00)
R^2	0.00	0.08	0.07	0.10
N	263455	263455	263455	260308

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

County-Level Analysis: Mortgagors

Delinquency stock: Mortgagor **headcount** share of CCP consumers regressions, 1999-2019

	(1)	(2)	(3)	(4)
County unemployment rate	0.23*** (0.00)	0.23*** (0.00)	0.30*** (0.00)	0.15*** (0.00)
National unemployment rate	0.09*** (0.00)	0.09*** (0.00)		0.44*** (0.01)
Net share of banks tightening lending standards		0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
Lag county unemployment rate				0.11*** (0.00)
Lag national unemployment rate				-0.39*** (0.01)
Lag Net share of banks tightening lending standards				0.00 (0.00)
Constant	0.03*** (0.00)	0.03*** (0.00)	0.03*** (0.00)	0.03*** (0.00)
R^2	0.23	0.25	0.25	0.26
N	263053	263053	263053	259908

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

County-Level Analysis: Renters' Delinquent Balances

Delinquency stock: Non-mortgagor share of credit card **balance**
regressions, 1999-2019

	(1)	(2)	(3)	(4)
County unemployment rate	0.47*** (0.00)	0.47*** (0.00)	0.80*** (0.00)	0.34*** (0.01)
National unemployment rate	0.45*** (0.01)	0.44*** (0.01)		1.14*** (0.03)
Net share of banks tightening lending standards		0.00*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
Lag county unemployment rate				0.19*** (0.01)
Lag national unemployment rate				-0.74*** (0.03)
Lag Net share of banks tightening lending standards				-0.02*** (0.00)
Constant	0.08*** (0.00)	0.08*** (0.00)	0.08*** (0.00)	0.08*** (0.00)
R^2	0.60	0.60	0.59	0.60
N	263452	263452	263452	260308

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

County-Level Analysis: Mortgagors' Delinquent Balances

Delinquency stock: Mortgagor share of credit card **balance** regressions, 1999-2019

	(1)	(2)	(3)	(4)
County unemployment rate	0.55*** (0.00)	0.55*** (0.00)	0.89*** (0.00)	0.36*** (0.01)
National unemployment rate	0.46*** (0.00)	0.46*** (0.00)		0.22*** (0.02)
Net share of banks tightening lending standards		-0.00*** (0.00)	-0.00*** (0.00)	0.01*** (0.00)
Lag county unemployment rate				0.26*** (0.01)
Lag national unemployment rate				0.18*** (0.02)
Lag Net share of banks tightening lending standards				-0.00*** (0.00)
Constant	-0.00*** (0.00)	-0.00*** (0.00)	0.00*** (0.00)	-0.00*** (0.00)
R^2	0.61	0.61	0.60	0.62
N	262790	262790	262790	259656

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

County-Level Analysis Summary

Basic takeaways from the cross-sectional analysis:

- Local unemployment is positively correlated with delinquency headcounts
- but for renters, the national unemployment is not
- There is no “wrong” sign for mortgagors
- But the *headcounts* of delinquency are much less related to unemployment than the *dollar share* (for both groups)
- Lending standards may contribute, but do not eliminate the puzzle

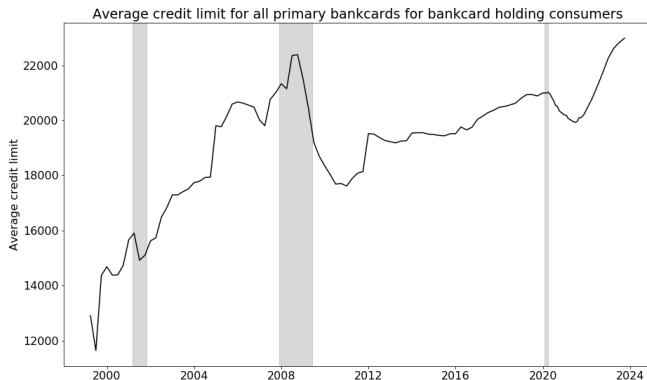
Robustness: The same patterns hold when we look at

- delinquency among card holders (as opposed to all “borrowers”),
- delinquency flows (as opposed to stocks).

Zooming in on Lending Standards

Lending standards tightened during the Great Recession

- both along the extensive margin (see above)
- and along the intensive margin: **Credit limits**

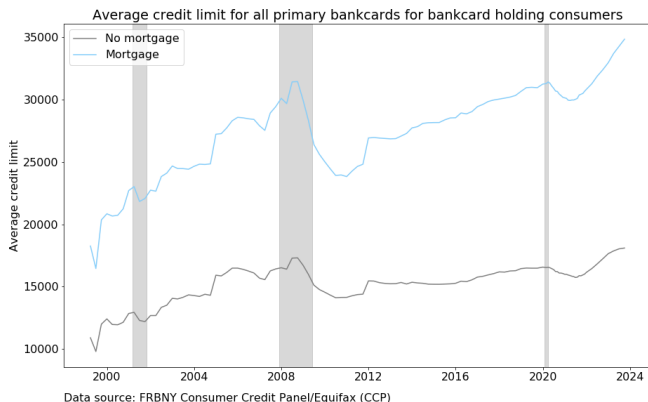


Data source: FRBNY Consumer Credit Panel/Equifax (CCP)

Zooming in on Lending Standards

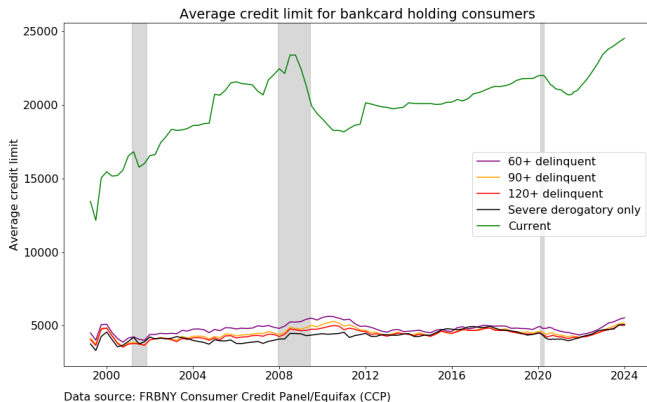
Credit limits tightened during the Great Recession

- both for mortgagors and “renters”



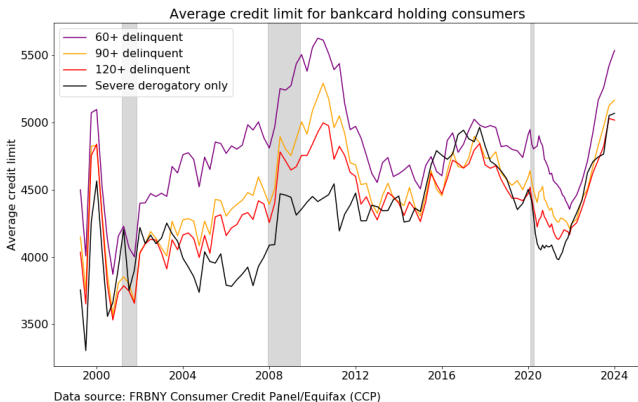
Zooming in on Lending Standards

But average credit limits of delinquent borrowers remained largely unchanged



Zooming in on Lending Standards

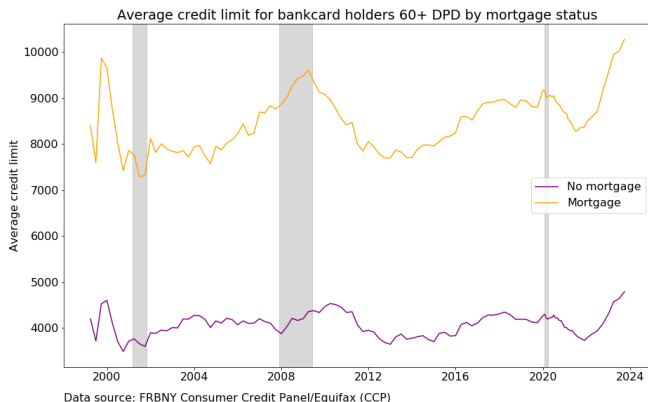
But average credit limits of delinquent borrowers remained largely unchanged



Zooming in on Lending Standards

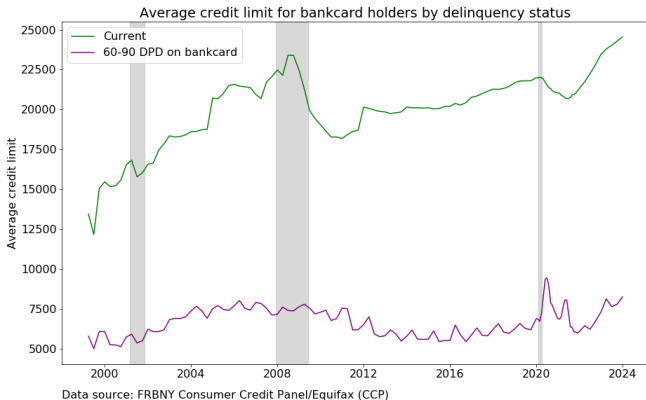
Average credit limits of delinquent borrowers did not decline

- especially for delinquent borrowers without mortgages



Zooming in on Lending Standards

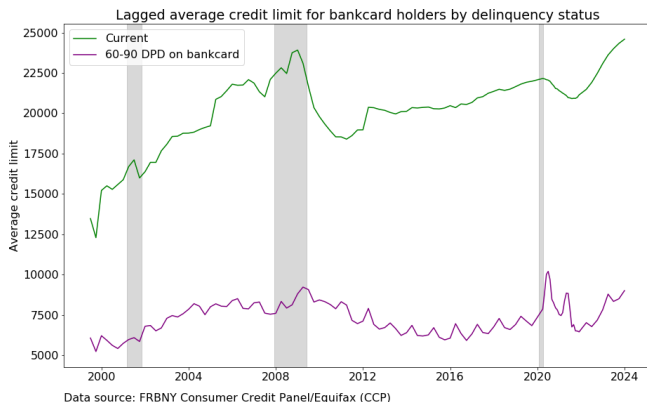
Average credit limits of **newly**-delinquent borrowers did not decline



Zooming in on Lending Standards

Average credit limits of **newly**-delinquent borrowers did not decline

- and lagging the credit limits does little to change the picture



Summary

- Delinquency rate of credit card **balances** is counter-cyclical
- But delinquency rate of credit card **borrowers** is almost acyclical
- We use micro data to decompose (mechanical) explanations

- This does not appear to be driven by changing lending standards
- This is in part due to shifts in **who** becomes delinquent
 - with homeowners playing a large role in the Great Recession
- and the depth of delinquency in recession

- Remaining puzzle: Why didn't more borrowers go delinquent?
 - particularly non-mortgagors, poorer borrowers

County-Level Analysis: Summary Statistics

Delinquency stock: Non-mortgagor summary statistics at county level

	mean	sd	min	max
County population of NMs in the CCP	2729.76	8782.231	1	316070
County population of NMs with a bankcard	1545.451	5187.909	0	208003
Share of CCP borrowers 60+ DPD	.0633945	.0289229	0	1
Share of bankcard borrowers 60+ DPD	.1217275	.0597033	0	1
Share of CCP borrowers 90+ DPD	.0593348	.0277668	0	1
Share of bankcard borrowers 90+ DPD	.1140802	.0574247	0	1
Share of bankcard balances 60+ DPD	.1156406	.0591465	0	1
Share of bankcard balances 90+ DPD	.1072914	.0569577	0	1
County unemployment rate	.0601679	.0295517	.006	.364
National unemployment rate	.0579087	.0180036	.035	.099
Net share of banks tightening lending standards	.0458361	.1600271	-.205	.667

County-Level Analysis

Delinquency stock: Mortgagor summary statistics at county level

	mean	sd	min	max
County population of mortgagors in the CCP	1008.914	3109.668	1	91120
County population of mortgagors with a bankcard	884.9618	2765.905	0	82612
Share of CCP borrowers 60+ DPD	.0508054	.0392171	0	1
Share of bankcard borrowers 60+ DPD	.0625132	.0498332	0	1
Share of CCP borrowers 90+ DPD	.0455438	.0370356	0	1
Share of bankcard borrowers 90+ DPD	.0561202	.0471313	0	1
Share of bankcard balances 60+ DPD	.0583474	.0594376	0	1
Share of bankcard balances 90+ DPD	.0519665	.056406	0	1
County unemployment rate	.060135	.0294853	.006	.364
National unemployment rate	.0579268	.018008	.035	.099
Net share of banks tightening lending standards	.0457769	.1600943	-.205	.667

County-Level Analysis: Card Holders

Delinquency stock: Non-mortgagor headcount share of credit card holders regressions, 1999-2019

	(1)	(2)	(3)	(4)
County unemployment rate	0.19*** (0.01)	0.19*** (0.01)	0.15*** (0.00)	0.18*** (0.01)
National unemployment rate	-0.03*** (0.01)	-0.05*** (0.01)		1.41*** (0.03)
Net share of banks tightening lending standards		0.04*** (0.00)	0.04*** (0.00)	0.01*** (0.00)
Lag county unemployment rate				0.03** (0.01)
Lag national unemployment rate				-1.52*** (0.03)
Lag Net share of banks tightening lending standards				0.00*** (0.00)
Constant	0.13*** (0.00)	0.12*** (0.00)	0.12*** (0.00)	0.13*** (0.00)
R^2	0.01	0.05	0.05	0.07
N	263453	263453	263453	260308

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

County-Level Analysis

Delinquency stock: Mortgagor headcount share of credit card holders regressions, 1999-2019

	(1)	(2)	(3)	(4)
County unemployment rate	0.28*** (0.00)	0.27*** (0.00)	0.38*** (0.00)	0.18*** (0.00)
National unemployment rate	0.14*** (0.00)	0.14*** (0.00)		0.48*** (0.01)
Net share of banks tightening lending standards		0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
Lag county unemployment rate				0.13*** (0.00)
Lag national unemployment rate				-0.38*** (0.01)
Lag Net share of banks tightening lending standards				-0.00 (0.00)
Constant	0.03*** (0.00)	0.03*** (0.00)	0.03*** (0.00)	0.03*** (0.00)
R^2	0.27	0.28	0.28	0.29
N	262846	262846	262846	259707

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

County-Level Analysis: Flows

Delinquency flow: Non-mortgagor summary statistics at county level

	mean	sd	min	max
County population of NMs in the CCP	2725.471	8764.904	1	312602
County population of NMs with a bankcard	1542.104	5170.119	0	203493
Share of CCP borrowers 60+ DPD	.0116057	.0095291	0	1
Share of bankcard borrowers 60+ DPD	.0220734	.0178646	0	1
Share of CCP borrowers 90+ DPD	.0103648	.0089287	0	1
Share of bankcard borrowers 90+ DPD	.0197882	.0167831	0	1
Share of bankcard balances 60+ DPD	.016233	.0203353	0	1
Share of bankcard balances 90+ DPD	.0146671	.0189753	0	1
County unemployment rate	.0604167	.0295569	.006	.364
National unemployment rate	.0581768	.0179485	.035	.099
Net share of banks tightening lending standards	.0451243	.1608731	-.205	.667

County-Level Analysis

Delinquency flow: Mortgagor summary statistics at county level

	mean	sd	min	max
County population of mortgagors in the CCP	1008.577	3109.773	1	91120
County population of mortgagors with a bankcard	884.5116	2765.353	0	82612
Share of CCP borrowers 60+ DPD	.0112306	.016925	0	1
Share of bankcard borrowers 60+ DPD	.0136958	.0207538	0	1
Share of CCP borrowers 90+ DPD	.0092326	.0153324	0	1
Share of bankcard borrowers 90+ DPD	.0112884	.0188542	0	1
Share of bankcard balances 60+ DPD	.0106858	.0240398	0	1
Share of bankcard balances 90+ DPD	.0091714	.0223682	0	1
County unemployment rate	.0603854	.0294923	.006	.364
National unemployment rate	.0581949	.0179528	.035	.099
Net share of banks tightening lending standards	.0450652	.1609396	-.205	.667

County-Level Analysis

Delinquency flow: Non-mortgagor headcount share of CCP consumers regressions, 1999-2019

	(1)	(2)	(3)	(4)
County unemployment rate	0.01*** (0.00)	0.01*** (0.00)	-0.06*** (0.00)	0.00 (0.00)
National unemployment rate	-0.09*** (0.00)	-0.10*** (0.00)		0.29*** (0.00)
Net share of banks tightening lending standards		0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
Lag county unemployment rate				-0.00 (0.00)
Lag national unemployment rate				-0.35*** (0.00)
Lag share of banks tightening lending standards				0.00** (0.00)
Constant	0.02*** (0.00)	0.02*** (0.00)	0.02*** (0.00)	0.02*** (0.00)
R^2	0.033	0.089	0.075	0.169
N	260315	260315	260315	257168

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

County-Level Analysis

Delinquency flow: Mortgagor headcount share of CCP consumers regressions, 1999-2019

	(1)	(2)	(3)	(4)
County unemployment rate	0.03*** (0.00)	0.03*** (0.00)	0.01*** (0.00)	0.02*** (0.00)
National unemployment rate	-0.02*** (0.00)	-0.02*** (0.00)		0.26*** (0.00)
Net share of banks tightening lending standards		0.01*** (0.00)	0.01*** (0.00)	0.00*** (0.00)
Lag county unemployment rate				0.01*** (0.00)
Lag national unemployment rate				-0.27*** (0.00)
Lag share of banks tightening lending standards				0.00*** (0.00)
Constant	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
R^2	0.004	0.085	0.083	0.137
N	259916	259916	259916	256771

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

County-Level Analysis

Delinquency flow: Non-mortgagor headcount share of credit card holders regressions, 1999-2019

	(1)	(2)	(3)	(4)
County unemployment rate	0.03*** (0.00)	0.03*** (0.00)	-0.07*** (0.00)	0.01** (0.00)
National unemployment rate	-0.13*** (0.00)	-0.14*** (0.00)		0.45*** (0.01)
Net share of banks tightening lending standards		0.02*** (0.00)	0.02*** (0.00)	0.01*** (0.00)
Lag county unemployment rate				-0.00 (0.00)
Lag national unemployment rate				-0.52*** (0.01)
Lag share of banks tightening lending standards				0.00 (0.00)
Constant	0.03*** (0.00)	0.03*** (0.00)	0.03*** (0.00)	0.03*** (0.00)
R^2	0.019	0.061	0.051	0.119
N	260313	260313	260313	257168

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

County-Level Analysis

Delinquency flow: Mortgagor headcount share of credit card holders regressions, 1999-2019

	(1)	(2)	(3)	(4)
County unemployment rate	0.04*** (0.00)	0.04*** (0.00)	0.02*** (0.00)	0.02*** (0.00)
National unemployment rate	-0.02*** (0.00)	-0.02*** (0.00)		0.29*** (0.01)
Net share of banks tightening lending standards		0.01*** (0.00)	0.01*** (0.00)	0.00*** (0.00)
Lag county unemployment rate				0.01*** (0.00)
Lag national unemployment rate				-0.30*** (0.01)
Lag share of banks tightening lending standards				0.00*** (0.00)
Constant	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
R^2	0.007	0.077	0.076	0.126
N	259709	259709	259709	256570

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

County-Level Analysis

Delinquency flow: Non-mortgagor share of credit card balance regressions, 1999-2019

	(1)	(2)	(3)	(4)
County unemployment rate	0.07*** (0.00)	0.06*** (0.00)	-0.01*** (0.00)	0.04*** (0.00)
National unemployment rate	-0.09*** (0.00)	-0.10*** (0.00)		0.16*** (0.01)
Net share of banks tightening lending standards		0.02*** (0.00)	0.02*** (0.00)	0.00*** (0.00)
Lag county unemployment rate				0.00 (0.00)
Lag national unemployment rate				-0.19*** (0.01)
Lag share of banks tightening lending standards				0.01*** (0.00)
Constant	0.02*** (0.00)	0.02*** (0.00)	0.02*** (0.00)	0.02*** (0.00)
R^2	0.061	0.095	0.090	0.198
N	260312	260312	260312	257168

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

County-Level Analysis

Delinquency flow: Mortgagor share of credit card balance regressions, 1999-2019

	(1)	(2)	(3)	(4)
County unemployment rate	0.09*** (0.00)	0.08*** (0.00)	0.10*** (0.00)	0.06*** (0.00)
National unemployment rate	0.03*** (0.00)	0.02*** (0.00)		0.19*** (0.01)
Net share of banks tightening lending standards		0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
Lag county unemployment rate				0.02*** (0.00)
Lag national unemployment rate				-0.15*** (0.01)
Lag share of banks tightening lending standards				0.01*** (0.00)
Constant	0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)
R^2	0.137	0.192	0.191	0.244
N	259653	259653	259653	256519

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$