Mortgage Market Inequality: Effects of COVID-19 Loss Mitigation Programs

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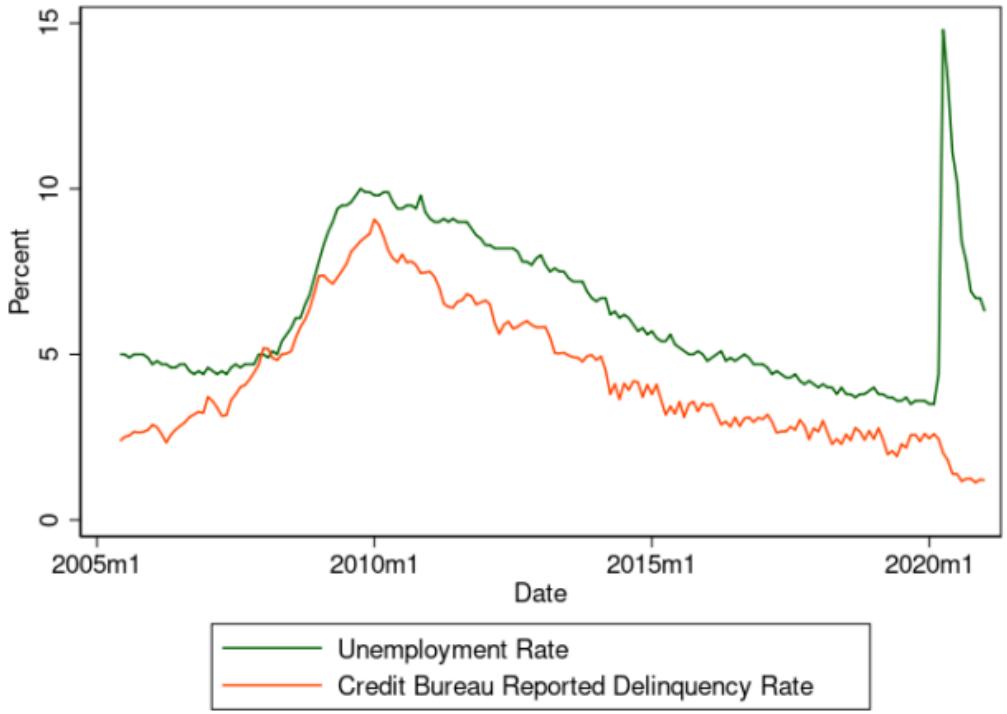
COVID-19 Impact on Mortgage Market?



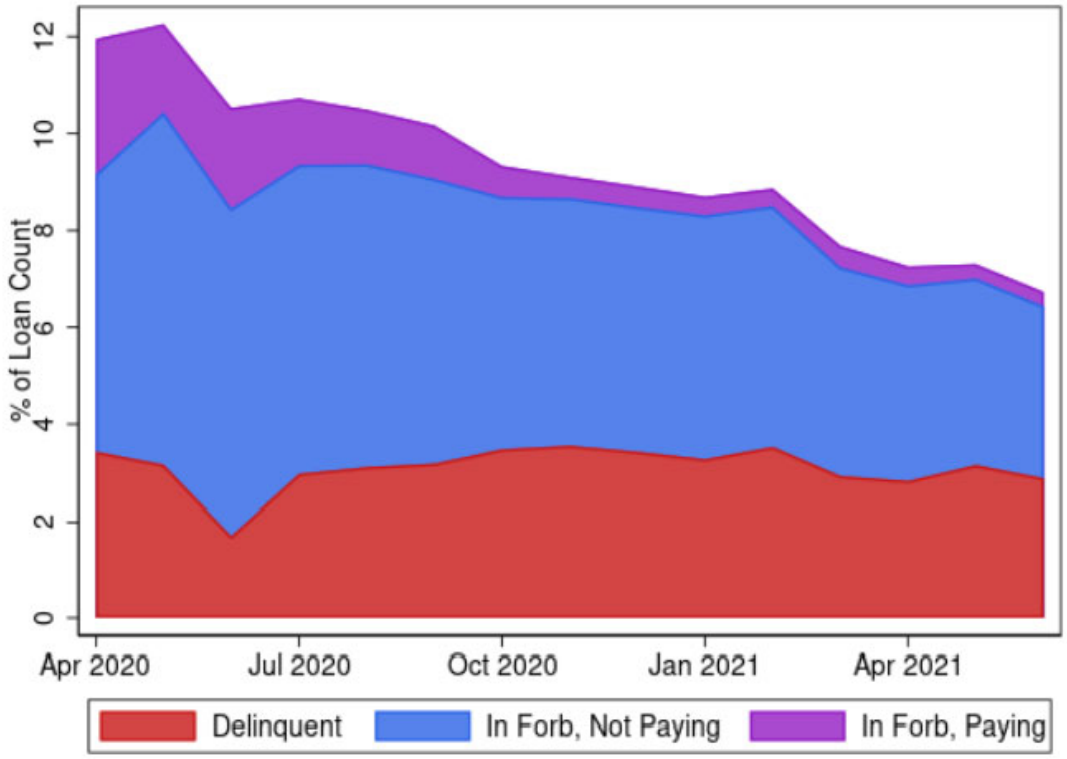
Data Source: FRED, FRBNY CCP

Forbearance is Key to Understand What We See

- Forbearance – Borrowers allowed to pause monthly repayment
- CARES Act forbearance to federally insured or backed (FHA, Fannie, Freddie, etc.) loans:
  - Granted without verification to those who requested: just needed borrower to say hardship to be "COVID-related"
  - Credit bureau reporting was "frozen" so nonpayment under forbearance not reported as delinquency
  - Set-up as a 12-month program; extended throughout the pandemic
- Most private sector loans (PLMBS and Portfolio) followed suit

Close to 9 Million Loans Forborne

- In peak month, 1 in 12 loans in forbearance



We Also Know Toll of COVID-19 Was Unequal

- Evidence that COVID-19 had a larger impact on minority and lower-income individuals
  - Higher infection and death rate (van Dorn, Cooney, Sabin 2020; Chakrabarti and Nober 2020)
  - Higher rates of job and income disruptions (Philadelphia Fed CFI COVD-19 Survey of Consumers)

Research Questions on Distributional Effects

- To what extent did the pandemic exacerbate financial distress of minority and lower-income mortgage borrowers?
  - Existing literature on recessions causing wider racial and income gaps in economic wellbeing
- (How) did blanket government policies like forbearance help mitigate or exacerbate the Pandemic effects?
  - Forbearance policies didn't target specific racial or income groups

Preview of Key Findings

1) For Black and Hispanic vs. White borrowers, mortgage nonpayment rate gap almost doubled from 2019 to 2020.
   - ~31% higher for lowest vs highest income quartile borrowers
2) However, credit-bureau reported delinquency rate, shows a **reversal** in trend.
   - Minority and lower-income borrowers took up mortgage forbearance at a higher rate, conditional on payment difficulty, leading to more reduction in reported delinquencies.
   - Forbearance policy helped minority and lower-income borrowers more *even though the policy was not targeted*
3) Post forbearance, minority borrowers used more help in terms of loan workouts to bring their mortgage back to normal.

- Our results demonstrate the importance of broad-based debt relief programs that combine short-term payment suspension with longer-term loss mitigation programs to reduce inequality in mortgage performance.

Overview

1) Motivation and Research Questions
2) Data
3) Research Design
4) Results
5) Conclusion

Loan-level Administrative Data

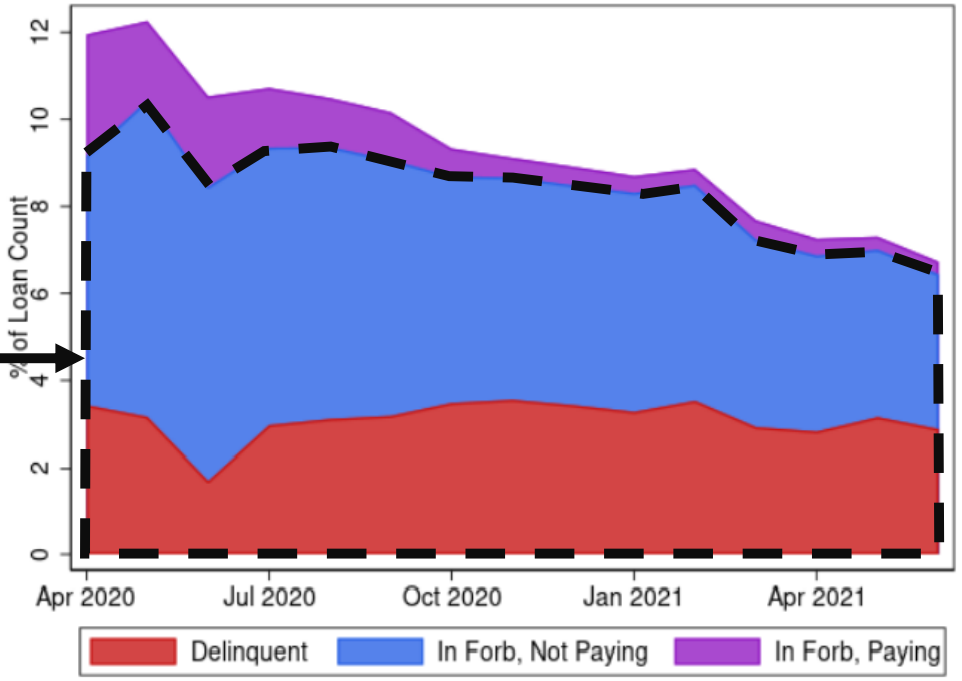
1) McDash Flash Data
   - Servicer-provided forbearance and loss mitigation indicator
   - Contains additional information on loan, such as actual payment amount
2) McDash Primary Data
   - Loan origination and performance history data from mortgage servicing records
   - Covers about 2/3 of U.S. mortgage market
3) Credit Risk Insights Servicing McDash (CRISM) Data
   - Information on borrower and borrower's other credit accounts
4) Confidential Home Mortgage Disclosure Act (HMDA) Data
   - Demographics and additional loan origination data
   - Borrower and Co-Borrower race, age, sex, ethnicity, application income

- We match these four sources of data (details)

Research Design – Outcome 1 Nonpayment

1) Nonpayment = 1 if ever miss payment during pandemic
   - Think of this as delinquency *in absence of* forbearance

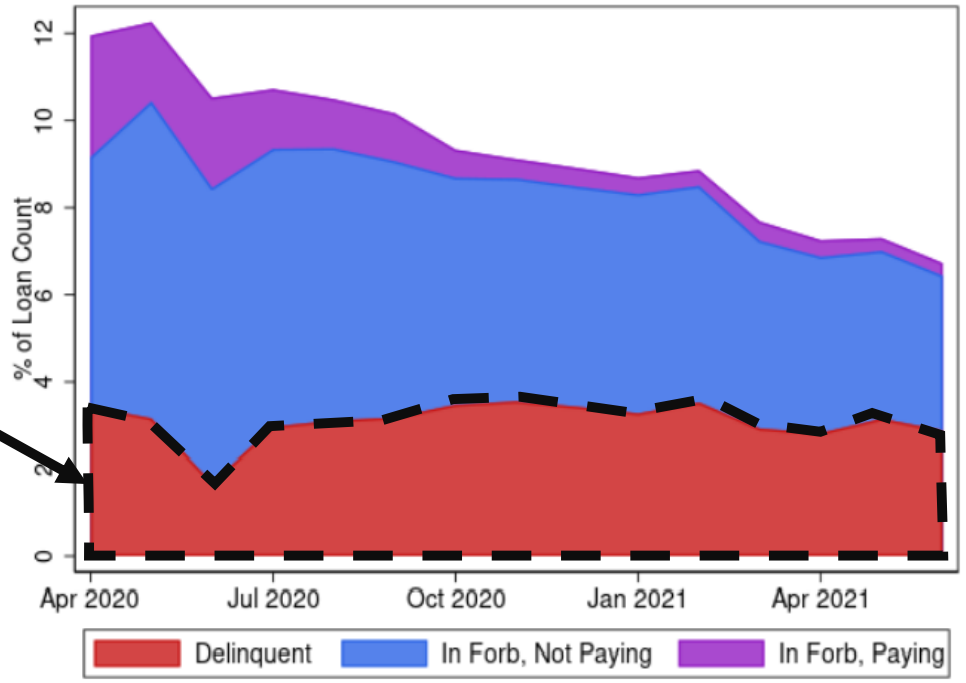
Nonpayment



Research Design – Outcome 2 Delinquency

2) Delinquency = 1 if ever miss payment AND not in forbearance during pandemic
   - Think of this as delinquency *inclusive of* forbearance

Delinquency



Research Design – Outcome 3 Forbearance Exit

3) Forbearance exit as of August 2022

   a) Self-cure: loan became current with lump-sum repayment
   b) Back to current with help: either put on some repayment plan, modification or payments under trial modification, or arrears deferred
   c) Forbearance/Delinquent/Default: not making payments, deemed delinquent, or paid off straight from forbearance or delinquency
      - Consider payoff from forb/del as “adverse” in the sense of potential involuntary loss of home

Research Design – LPM with DID

- For outcomes (1) and (2), we additionally employ a Difference-in-Differences-like estimation using 2016-2020 data:

$$Y_{izt} = \alpha_0 + \alpha_1 P_{izt} + \sum_j \gamma_j T_{j,izt} + \sum_j \beta_{jt} \left(T_{j,izt} * P_{izt}\right) + X'_{izt}\Gamma + \tau_z + \varepsilon_{izt}$$

- $T_{j,izt}$ - race or income characteristic j
  - For race, excluded category is White
  - For income, excluded category is 4th quartile of income (highest income group)
- P_{izt} - "post" dummy for April 2020 onwards (Pandemic period)
- β_{jt} captures the percentage point increase in outcome vis-à-vis 2019 baseline
- X_{iz} - credit and loan characteristics
  - At origination: origination year FE, credit score bins, LTV, log origination amount
  - As of Jan 2020: credit score bins, delinquent before March, updated LTV in bins, investor type, total number of credit accounts, number past due, log of past due amount
- τ_z - zip code fixed effects

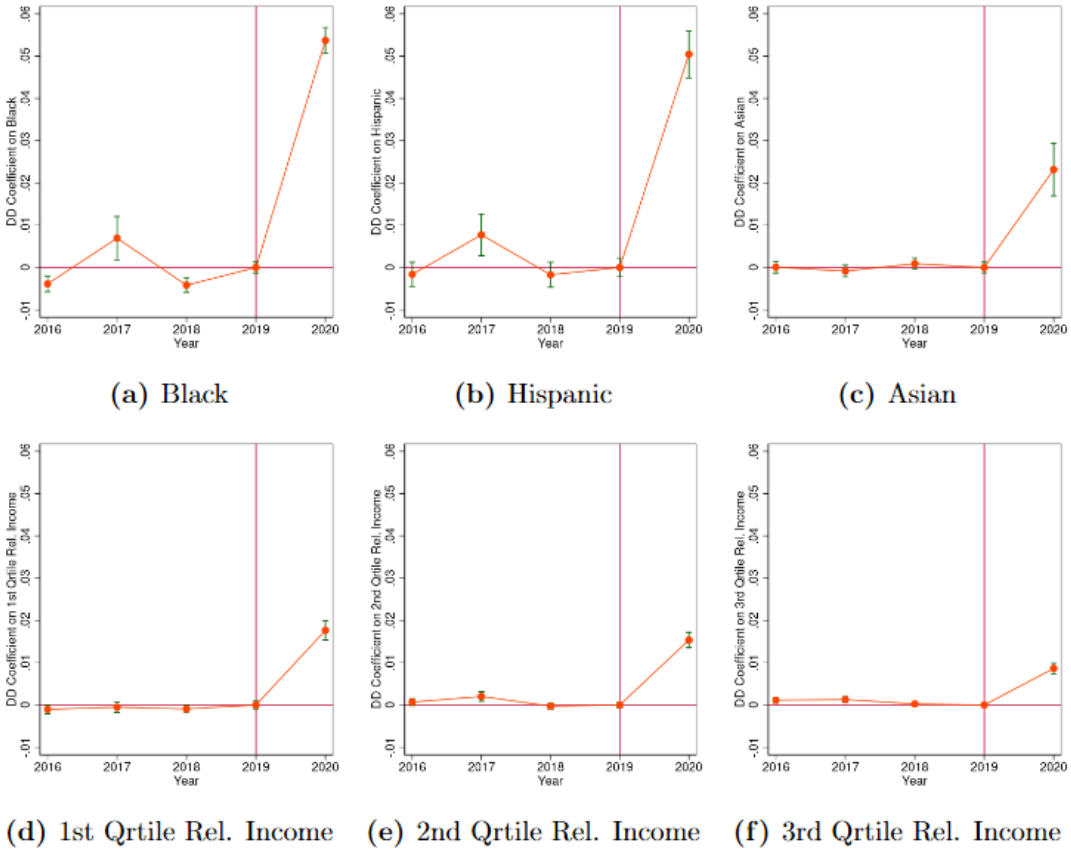
Research Design – Multinomial Logit

- For forbearance exit we use a multinomial logit model to examine *ExitStatus* defined as follows

$$ExitStatus = \begin{cases} 1 & if\ self\ cured \\ 2 & if\ resolved\ with\ help\ or\ in\ trial\ modification \\ 3 & if\ still\ in\ forbearance, defaulted, delinquent \\ & or\ paid\ off\ from\ delinquency/forbearance \end{cases}$$

- We include all credit, loan, and locational characteristics as controls

Results: Pandemic Exacerbated Nonpayment Differences

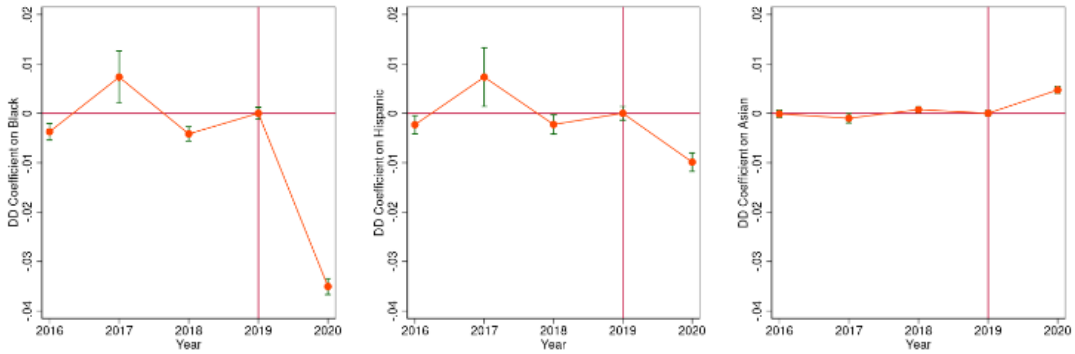


(a) Black (b) Hispanic (c) Asian

(d) 1st Qrtile Rel. Income (e) 2nd Qrtile Rel. Income (f) 3rd Qrtile Rel. Income

- Black and Hispanic borrowers experienced ~5pp higher rise in nonpayment rates from 2019 to 2020, compared to White borrowers
  - Nonpayment gap almost doubled during the Pandemic.
- Lower income borrowers in 1st-3rd Quartiles experienced 1.7, 1.4, 0.9pp higher increase respectively.

However, Forbearance Reduced Inequality in Delinquencies



(a) Black (b) Hispanic (c) Asian

(d) 1st Qrtile Rel. Income (e) 2nd Qrtile Rel. Income (f) 3rd Qrtile Rel. Income

Most Borrowers Exited Forbearance Well

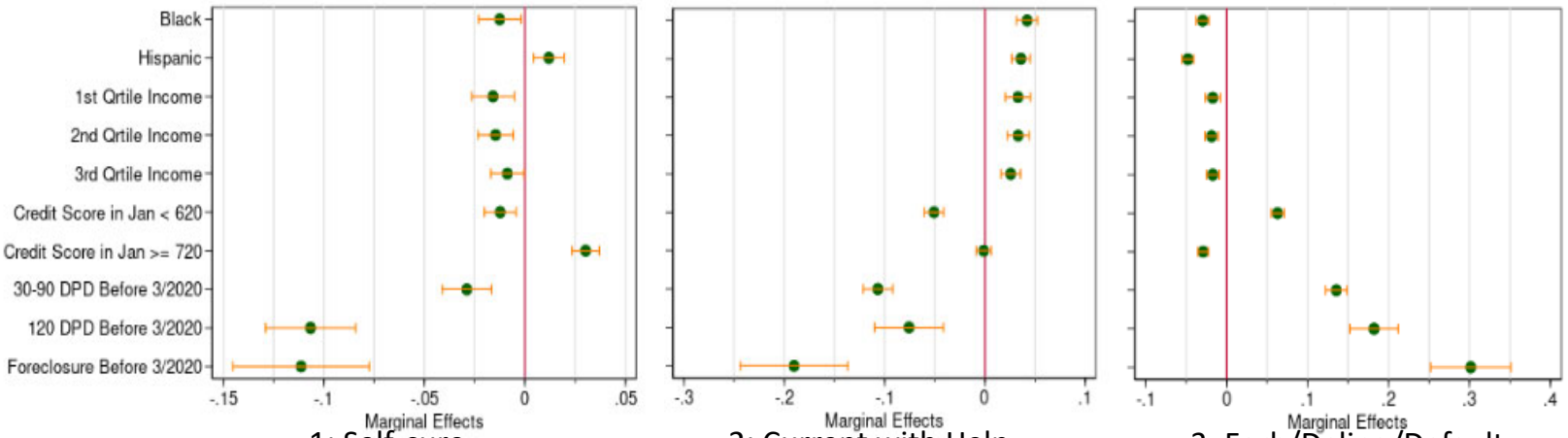
Table 1. COVID-19 Forbearance Exits by Category

Category 1: Self-Cure	22.5%
Category 2: Current with Help	58.0%
Repayment Plan	22.7%
Deferral	18.1%
Modification	16.4%
Trial Modificaiton	0.9%
Category 3 Forbearance/Delinquent/Default	19.5%
Still in Forbearance	2.0%
In Loss Mitigation But Not Paying	1.6%
Delinquent, Not in Loss Mitigation	4.2%
Paid Off from Forbearance or Delinquency	11.7%
Default	0.1%
Total	100.0%

- As of August 2022, around 80% became current with or without help
- ~ 12% paid off from delinquency or forbearance
  - These are people who sold their houses (most likely downsized)

But Minority, Lower-Income Borrowers Used More Help

Marginal Effects from Multinomial Logit Model For Forbearance Resolution Status As of August 2022



1: Self-cure 2: Current with Help 3: Forb/Delinq/Default

- Black, Hispanic, and lower-income borrowers were more likely to exit to performing status with help
- This highlights how crucial forbearance and associated workout programs were in helping maintain homeownership in the longer-term

Conclusions

- Pandemic has caused a rise in nonpayment, especially among minority, lower-income borrowers
- Forbearance as a blanket policy was successful in mitigating unequal toll for minority and lower-income borrowers
- Minority and lower-income borrowers used more help in exiting forbearance, and streamlined loan modifications helped them.
- We leave for future work:
  - **why** some borrowers missed forbearance opportunities
  - **why** minorities had higher forbearance take up rate, conditional on payment difficulty
  - the longer-term consequences of loans in forbearance and loans taking up loan modifications

Appendix

Summary Statistics

Variable	*Full Sample*	*Never Miss Pay*	*Ever Miss, Ever Forb*	*Ever Miss, Never Forb*
Ever in Nonpayment	0.083	-	-	-
Ever in Forbearance	0.101	0.034	-	-
Primary Borrower Characteristics				
White	0.777	0.798	0.718	0.755
Black	0.064	0.052	0.128	0.133
Asian	0.057	0.052	0.058	0.026
Hispanic	0.094	0.082	0.16	0.115
Avg. Household Income	106,769	106,698	88,008	67,039
Age	51.0	51.5	47.2	48.0
Origination Credit Score	737	743	700	679
Credit Score in Jan 2020	749	767	679	607
Mortgage Loan Characteristics and Performance				
GSE Loan	0.632	0.688	0.516	0.331
FHA/VA Loan	0.255	0.214	0.426	0.602
Private Label MBS Loan	0.014	0.005	0.010	0.015
Portfolio Loan	0.099	0.093	0.049	0.053
Origination LTV	79	77	86	89
Updated LTV Jan 2020	48	45	55	55
Delinquent Pre-Pandemic	0.013	0.002	0.086	0.345
Foreclosure Pre-Pandemic	0.002	0.000	0.005	0.045
Large Servicer	0.975	0.962	0.963	0.946
Avg. Loan Amount	240,988	233,352	230,856	173,032
Current Interest Rate	4.13	4.09	4.30	4.46
Equifax Credit Bureau Characteristics				
Total Non-Mortgage Debt	33,882	32,337	47,804	32,122
Total Monthly Payments	2,961	2,864	3,281	2,316
Share with Auto Debt	0.551	0.538	0.638	0.578
Share with Student Loan Debt	0.170	0.160	0.249	0.205
Share with Credit Card Debt	0.951	0.952	0.940	0.832
Credit Card Utilization	0.271	0.243	0.486	0.621
More Than 1 Account Past Due	0.016	0.008	0.077	0.179

- Those Who Ever Miss Payment:
  - Higher share of minority and lower-income
  - Lower Credit Score at origination and Jan 2020
  - More likely to be delinquent pre-pandemic
  - These hold in comparison of ever forb vs never forb
- Those in Forbearance vs Miss Forb
  - Higher other debt amount
  - More with Auto, Student Loan, Credit Card Debt
  - But Credit Card Utilization Lower

Matching Process

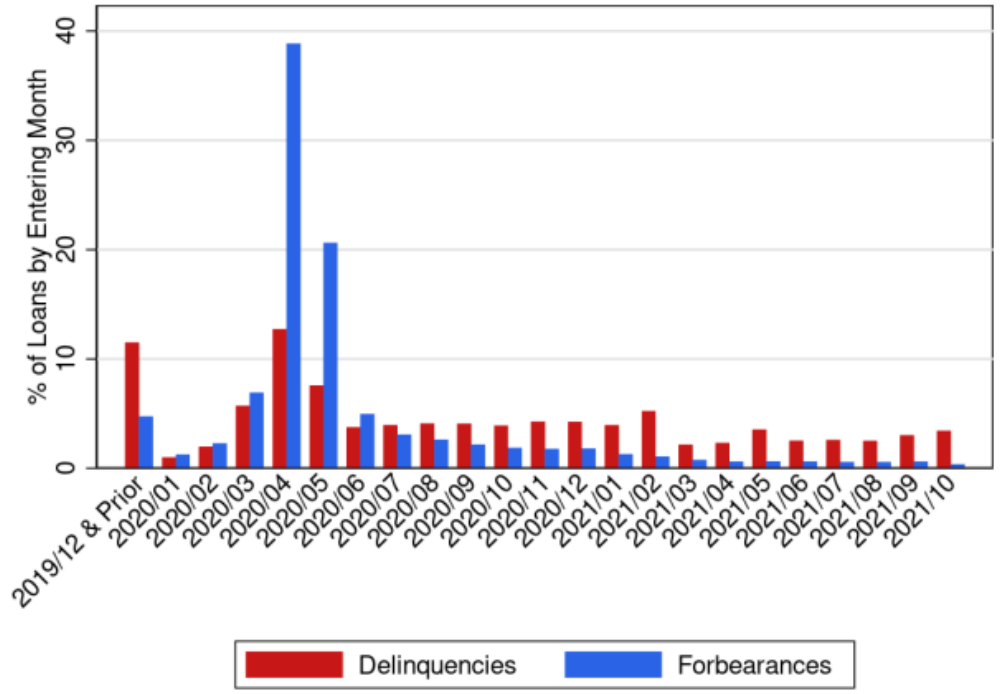
- Credit Bureau uses proprietary algorithm to match loans in Black Knight's McDash Dataset to their credit files, which we additionally verify (CRISM)
- We fuzzy-match these Credit-Bureau-matched McDash loans to HMDA using
  - Geography: HMDA provides Census Tract and McDash provides property zip codes
  - Loan origination characteristics: loan amount, lien status, occupancy, loan purpose, loan type
  - Closing date: we allow some flexibility (e.g. use month instead of exact date) here due to how reporting works
  - We only use unique matches
- We match about 65% of CRISM loans to HMDA uniquely
- As the McDash Flash sample is a sub-sample of McDash loans, we end up with 47% of CRISM loans matched finally to both HMDA and McDash Flash
- Characteristics of matched loans are representative of the overall CRISM sample

Match Representativeness

	(1) *All CRISM*	(2) *CHMDA-Matched*	(3) *Flash-Matched*	(4) *Both-Matched*
Match Rate	100%	65%	69%	47%
			Means	
Current Credit Score	746.30	748.57	754.46	755.60
Current Credit Score < 620	0.06	0.05	0.06	0.05
Current Credit Score 620-719	0.19	0.20	0.16	0.16
Current Credit Score ≥ 720	0.58	0.61	0.58	0.62
Current Credit Score Missing	0.17	0.14	0.20	0.17
Credit Score at Orig	728.55	730.95	729.64	732.47
Credit Score at Orig < 620	0.04	0.03	0.04	0.03
Credit Score at Orig 620-719	0.30	0.31	0.29	0.30
Credit Score at Orig ≥ 720	0.52	0.55	0.55	0.58
Credit Score at Orig Missing	0.15	0.11	0.12	0.09
Age	52.43	51.51	52.54	51.85
Age < 35	0.10	0.12	0.10	0.11
Age 35-44	0.22	0.23	0.22	0.23
Age 45-54	0.24	0.24	0.24	0.24
Age 55-64	0.23	0.22	0.24	0.23
Age ≥ 65	0.20	0.19	0.21	0.20
GSE Loan	0.61	0.61	0.63	0.64
FHA/VA Loan	0.27	0.28	0.25	0.25
PLMBS Loan	0.04	0.03	0.04	0.03
Portfolio Loan	0.08	0.09	0.08	0.09
Orig Amount	227068.14	230939.35	227620.43	229701.10
LTV Ratio	78.74	79.30	78.21	86.18
Monthly Payment	2875.76	2883.66	2879.48	2893.09
Closing Year	2013.38	2014.08	2013.33	2013.85
Current Interest Rate	4.28	4.20	4.26	4.20
Count of Accounts	7.46	7.50	7.41	7.44
Count of DPD Accounts	0.06	0.06	0.06	0.05
Non-FM Balance Past Due	33.65	27.80	33.28	29.28

(Back)

Why We Focus on April-Dec 2020



- 65% of loans entered forbearance March-June 2020, and most by December 2020

(Back)

Nonpayment Rate Rose Higher for Minority and Lower-Income Mortgage Borrowers

Dep Var: Ever in Nonpayment	(1) *Race*	(2) *Income*	(3) *Credit Chars*	(4) *Local Chars*	(5) *Zip FE*
Black	0.107***		0.038***	0.032***	0.030***
	(0.002)		(0.002)	(0.002)	(0.002)
Asian	0.011**		0.019***	0.017***	0.017***
	(0.004)		(0.003)	(0.003)	(0.002)
Hispanic	0.069***		0.033***	0.030***	0.023***
	(0.004)		(0.003)	(0.003)	(0.002)
Borrower Income: 1st Qrtile.		0.055***	0.042***	0.042***	0.045***
		(0.002)	(0.001)	(0.001)	(0.001)
Borrower Income: 2nd Qrtile.		0.040***	0.026***	0.026***	0.028***
		(0.002)	(0.001)	(0.001)	(0.001)
Borrower Income: 3rd Qrtile.		0.019***	0.012***	0.012***	0.014***
		(0.001)	(0.001)	(0.001)	(0.001)
Credit Score in Jan $<$ 620			0.125***	0.125***	0.124***
			(0.002)	(0.002)	(0.002)
Credit Score in Jan $\geq$ 720			-0.066***	-0.065***	-0.065***
			(0.001)	(0.001)	(0.001)
Constant	0.068***	0.054***	-0.325***	-0.455***	-0.303***
	(0.001)	(0.002)	(0.016)	(0.034)	(0.012)
Observations	1,957,724	1,957,724	1,957,724	1,957,724	1,957,724
R-squared	0.013	0.006	0.146	0.147	0.163
Average Rate	0.083	0.083	0.083	0.083	0.083
Zip Code FE	N	N	N	N	Y

- Minority and Lower-income borrowers have higher raw rates of nonpayment compared to White or higher-income borrowers
- Racial differences decrease with credit characteristics, but still remain in our full specification
- Income differences seem more robust across specifications

Forbearance Reduced Inequality in Delinquency Rates

Dep Var: *=1 if Never Forb, Delinq*	(1) *Race*	(2) *Income*	(3) *Credit Chars*	(4) *Local Chars*	(5) *Zip FE*
Black	0.007***		-0.003***	-0.003***	-0.003***
	(0.001)		(0.000)	(0.001)	(0.001)
Asian	-0.002***		-0.000	-0.000	-0.000
	(0.000)		(0.000)	(0.000)	(0.000)
Hispanic	0.002***		-0.002***	-0.002***	-0.002***
	(0.000)		(0.000)	(0.000)	(0.000)
Income: 1st Qrtile.		0.007***	0.001***	0.001***	0.001***
		(0.000)	(0.000)	(0.000)	(0.000)
Income: 2nd Qrtile.		0.004***	-0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.000)	(0.000)
Income: 3rd Qrtile.		0.002***	-0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.000)	(0.000)
Credit Score in Jan $<$ 620			0.016***	0.016***	0.016***
			(0.001)	(0.001)	(0.001)
Credit Score in Jan $\geq$ 720			-0.004***	-0.004***	-0.004***
			(0.000)	(0.000)	(0.000)
Constant	0.005***	0.002***	0.028***	0.030***	0.025***
	(0.000)	(0.000)	(0.003)	(0.005)	(0.003)
Observations	819,038	819,038	819,038	819,038	819,038
R-squared	0.001	0.001	0.120	0.120	0.148
Average Rate	0.005	0.005	0.005	0.005	0.005
Zip Code FE	N	N	N	N	Y

- Raw differences in delinquency rates are very small, especially compared to nonpayment rates
- Shows that *inclusive of forbearance* racial and income differences in delinquency rates are small