Shadow Bank Distress and Household Debt Relief: Evidence from the CARES Act

by Susan Cherry, Erica Jiang, Gregor Matvos, Tomasz Piskorski and Amit Seru

Online Appendix

TABLE A1: PAYMENTS SCALED BY SHADOW BANK FINANCIAL CONDITIONS

	Payments / Cash	Payments / Asset	Payments / Equity	Payments / Debt	Payments / Net Income
P25	1	0.02	0.18	0.05	-2.7
Median	2.9	0.08	0.36	0.18	0.22
P75	3.5	0.16	0.51	0.48	2.6

Notes: This table shows advance payments scaled by shadow bank financial conditions. The underlying sample includes the shadow banks that are identified as big servicers in both Fannie Mae and Freddie Mac samples. The total payment advances include the total payments of loans in forbearance from March 2020 to March 2021 in the Fannie Mae, Freddie Mac, and Ginnie Mae samples.

Source: Shadow bank call reports, loan-level data from GSEs (Fannie Mae and Freddie Mac) and from Ginnie Mae (FHA loans).

TABLE A2: CHARACTERISTICS OF BANK AND SHADOW BANK LOANS

	GSE		Ginnie Mae	
	Bank	Shadow Bank	Bank	Shadow Bank
Aggregate Unpaid Principal Balance	2.8 T	2.3 T	0.60 T	1.3 T
Total Loan Count	15.6 M	10.8 M	4.1 M	7.3 M
Aggregate Monthly Payment	16.7 B	13.2 B	3.3 B	6.5 B
Monthly Payment	1090	1194	837	975
	[1370]	[2540]	[478]	[527]
FICO	754	748	702	684
	[47]	[49]	[58]	[59]
LTV	72	73	94	94
	[17]	[17]	[9]	[10]
DTI	34	35	38	41
	[10]	[10]	[11]	[10]
Time to Maturity	241	266	263	302
	[96]	[98]	[73]	[62]

Notes: This table shows characteristics of loans by banks and shadow bank originators for both GSE and FHA backed mortgages. The variables are taken as of January 2020. Since the GSE do not disclose identity of servicers that service less than 1% of total unpaid outstanding balance, we remove loans without identified servicers. To account for these removed loans, we scale aggregate GSE numbers by a factor of 1.67. Standard deviations are in brackets.

Source: Loan-level data from GSEs (Fannie Mae and Freddie Mac) and from Ginnie Mae (FHA loans).

TABLE A3: INTERMEDIARY TYPE AND MORTGAGE FORBEARANCE DURING COVID

	Full Sample		Originated by Banks		Originated and Sold by Banks	
	(1)	(2)	(3)	(4)	(5)	(6)
Pandemic * Shadow Bank	-0.93***	-1.12***	-1.86***	-1.86***	-0.10*	0.13**
	(0.03)	(0.03)	(0.05)	(0.05)	(0.06)	(0.06)
Shadow Bank	-0.40***	-0.26***	0.46***	0.33***	-0.08***	-0.41***
	(0.01)	(0.03)	(0.02)	(0.04)	(0.02)	(0.06)
Zip-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Origination Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Originator FE	No	Yes	No	Yes	No	Yes
R2	0.06	0.06	0.06	0.06	0.05	0.05
Observations	151M	122M	80M	80M	11M	11M

Notes: This table presents loan-level regression results of forbearance and servicer type. The dependent variable is 100 if a loan is in forbearance. Column 1 and 2 use the full sample that covers all loans sold to Fannie Mae and Freddie Mac since 2000 and that were still active as of January 2020. Columns 3 and 4 use the subsamples of loans originated by banks. Column 5 and 6 use the subsamples of loans originated and sold by banks. Pandemic is an indicator that equals 1 for periods after March 2020. Shadow Bank is an indicator for whether the servicer is a shadow bank. Other controls include delinquency status in January 2020, FICO, interest rate, debt-to-income, loan-to-value, their interactions with Pandemic, ln(Payment), and ln(Balances). The underlying sample is from January 2020 to March 2021. Since the GSE do not disclose identity of servicers that service less than 1% of total unpaid outstanding balance, we remove loans without identified servicers. Standard errors are clustered by zip code. ***, **, * represent 1%, 5%, and 10% significance, respectively. *Source:* Loan-level data from GSEs (Fannie Mae and Freddie Mac).

**TABLE A4 – SHADOW BANK CAPITAL STRUCTURE**

	2019Q1-Q3	2020Q1	2020Q2	2020Q3
Panel A. Full Sample				
Equity/Assets	25.9	24.3	25.7	26.4
Risk based tier 1 capital ratio (Upper)	50.3	54.4	61.5	62.0
Risk based tier 1 capital ratio (Lower)	41.3	45.8	50.9	51.0
Liquid Asset/Assets	17.5	19.2	20.4	20.1
Short-term Debt Ratio	94.5	94.2	93.8	92.8
Long-term Debt/Total Debt	5.5	5.8	6.2	7.2
Servicing Liability/Total Debt	2.9	3.1	3.7	3.8

Panel B. Subsample by MSR Ratio

	2019Q1-Q4		2020Q1		2020Q2		2020Q3	
	Low MSR	High MSR	Low MSR	High MSR	Low MSR	High MSR	Low MSR	High MSR
Equity/Assets	24.7	27.1	24.6	24.1	25.0	26.4	26.2	26.6
Risk based tier 1 capital ratio (Upper)	65.2	35.6	77.8	31.6	85.5	37.9	87.0	37.3
Risk based tier 1 capital ratio (Lower)	53.2	29.5	66.2	25.8	71.7	30.3	73.0	29.3
Liquid Asset/Assets	21.7	13.2	24.0	14.4	24.7	16.1	25.1	15.1
Short-term Debt/Total Debt	94.3	94.7	92.9	95.3	93.4	94.1	93.0	92.6
Long-term Debt/Total Debt	5.7	5.3	7.1	4.7	6.6	5.9	7.0	7.4
Servicing Liability/Total Debt	2.0	3.8	2.4	3.8	2.5	4.8	2.5	4.9

Notes: This table reports the capital structure of shadow banks active in the US mortgage market in our sample ranging from 2019 Q1 to 2020 Q3. The sample covers 343 shadow banks that have a license in the state that provided us data. Shadow banks are classified into Low MSR and High MSR shadow banks based on their mortgage servicing rights share of total assets.

Source: Shadow banks' quarterly call report filings.

FIGURE A1: SHADOW BANK LOAN SERVICING OVER TIME

This figure plots the percent (Panel A) and total payment (Panel B) of loans serviced by shadow banks for both Ginnie Mae and GSE mortgages. Both figures use the full sample that covers all loans sold to Fannie Mae and Freddie Mac since 2000 and all loans securitized by Ginnie Mae MBS issuers since 2013. Since the GSE do not disclose identity of servicers that service less than 1% of total unpaid outstanding balance, we remove loans without identified servicers. Monthly payments are based on authors' own calculation using unpaid outstanding balance, interest rate, and loan term. *Source:* Loan-level data from GSEs (Fannie Mae and Freddie Mac) and from Ginnie Mae (FHA loans).
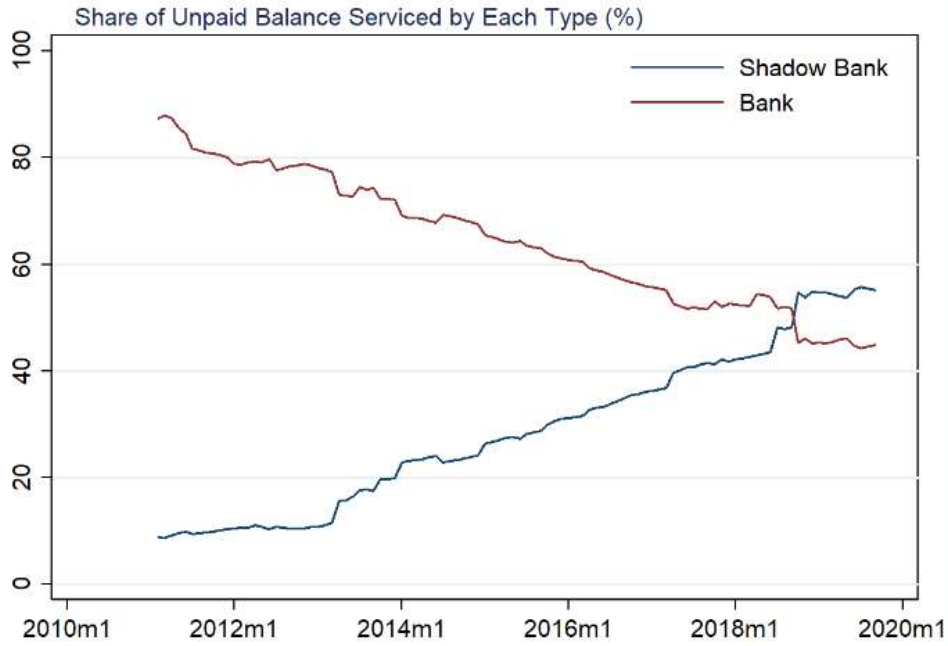
Panel (a): Percent of Loans Serviced by Shadow Banks
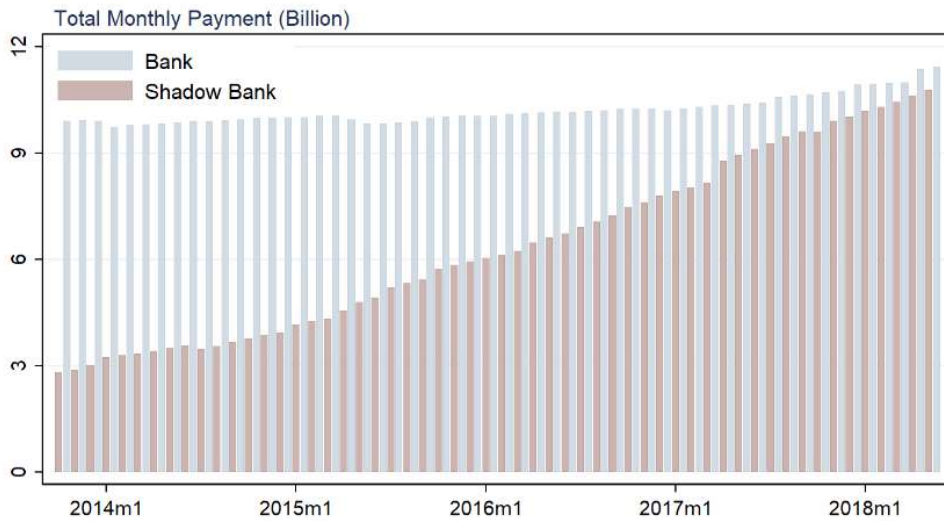
Panel (b): Monthly Mortgage Payment Delivered by Shadow Banks

This figure presents loan-level regression estimates of forbearance likelihood on servicer type (shadow bank dummy) interacted with time dummies. The dependent variable is 100 if a loan is in forbearance. Panel (a) uses the full sample that covers all loans sold to Fannie Mae and Freddie Mac since 2000 and that were still active as of January 2020. Our sample period is from January 2020 to December 2020. Panel (b) uses the subsample of loans originated by banks where some of these loans are serviced by shadow banks. Other controls include time dummies, delinquency status in January 2020, FICO, interest rate, debt-to-income, loan-to-value, their interactions with Pandemic, ln(Payment), and ln(Balances). Since the GSE do not disclose identity of servicers that service less than 1% of total unpaid outstanding balance, we remove loans without identified servicers. Standard errors are clustered by zip code. ***, **, * represent 1%, 5%, and 10% significance, respectively.
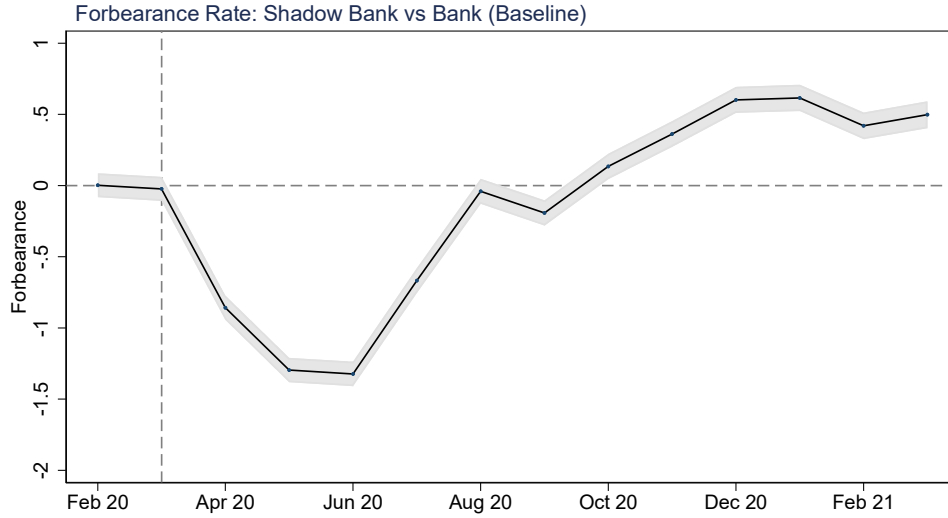
(a) Baseline
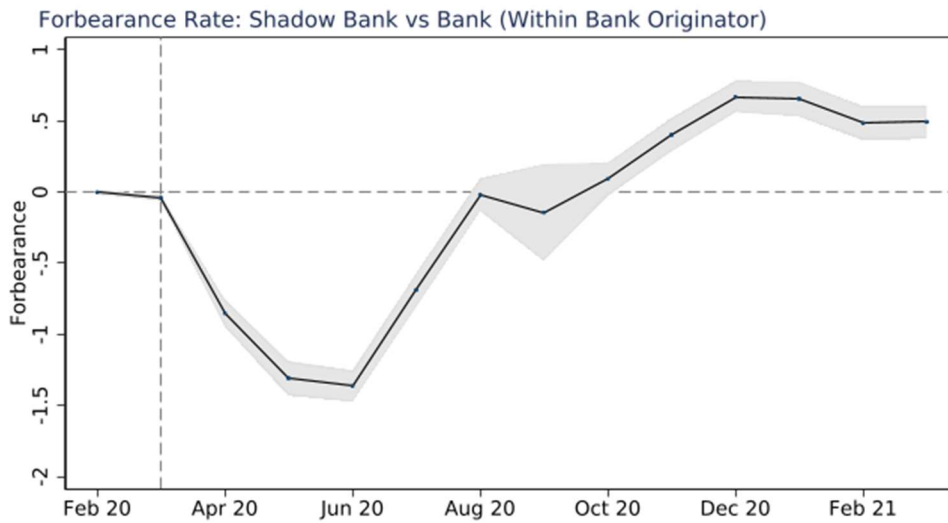
(b) Within Originator

FIGURE A3: MSR SHARE AND CAPITAL RATIO

This figure presents the binned scatterplot of pre-pandemic equity to asset against MSR to asset ratio. For every shadow bank, we calculate its MSR to asset ratio in 2019 and divide shadow bank-quarter observations into 50 buckets based on their quarterly average MSR to asset ratios. We then plot the average equity to asset ratio of each bucket against the average MSR ratio of the bucket. *Source:* shadow bank call reports.
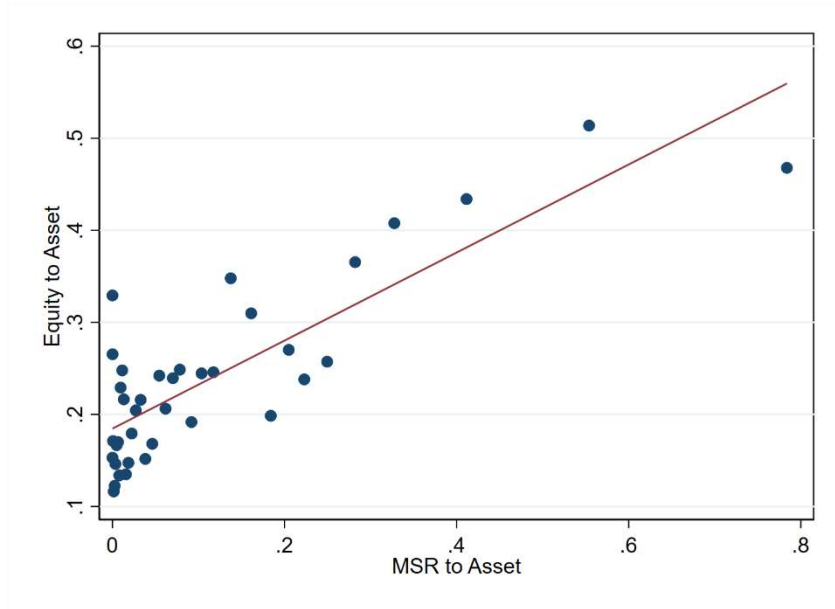
This figure presents dynamic difference in difference coefficients:

$$Y_{it} = \sum_t \beta_t \, MSR_i + \Gamma X_{it} + \mu_i + \epsilon_{it}$$

MSR is pre-pandemic MSR ratio in 2019, standardized by sample standard deviation. Panel (a)-(f) presents the effect of one standard deviation increase in pre-pandemic MSR on ln total equity, short-term debt ratio, ln total asset, ln mortgage asset, ln servicing loan counts, and ln MSR assets, respectively. The omitted quarter is 2019Q4. Standard errors are clustered by shadow bank. ***, **, * represent 1%, 5%, and 10% significance, respectively.
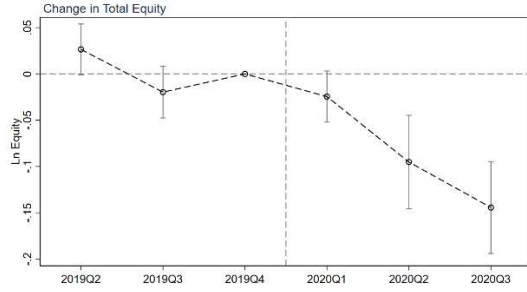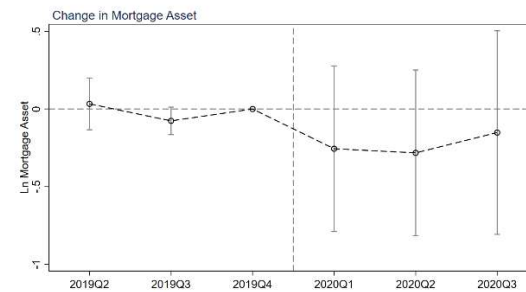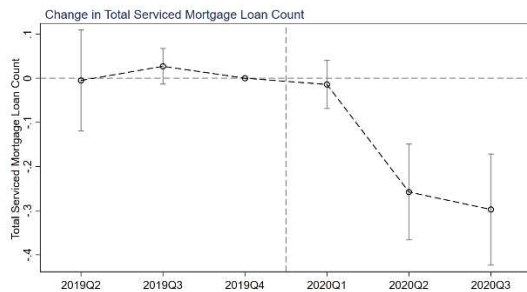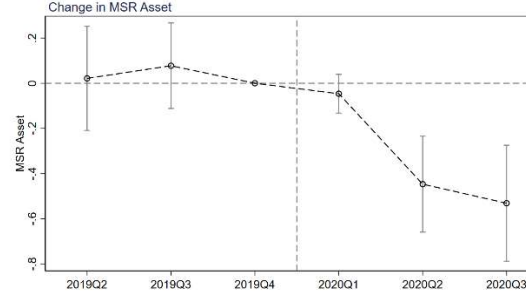

(a) Total Equity
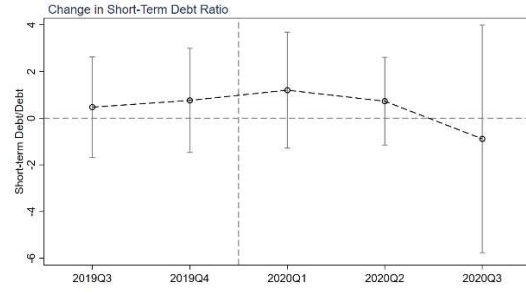
(b) Short-Term Debt Ratio
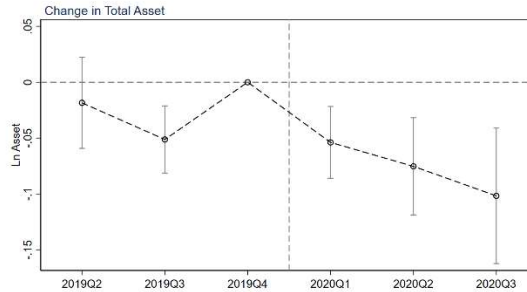
(c) Total Asset

(d) Mortgage Asset

(e) Servicing Mortgage Loan Count

(f) MSR Asset