

Heterogeneity in the Effect of COVID-19 Mortgage Forbearance: Evidence from Large Bank Servicers

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Abstract

This study examines the effectiveness of COVID-19 mortgage forbearance programs using data from the largest national bank servicers. Analyses of the data indicate that the forbearance entry rate was higher for borrowers with lower credit scores and in areas with higher unemployment rates. Some borrowers under forbearance had high credit scores, and a significant proportion continued to pay. Borrowers who had higher credit scores, made more payments under forbearance, and experienced greater labor market recovery were the earliest to exit the forbearance. Borrowers exited forbearance via different forms, with a large proportion delaying the payments of the forborne amount at maturity, refinancing, or the property sale. One potential downside of nonpayment under forbearance is its adverse impact on ability to be refinanced, which is supported by some empirical evidence. However, the effect was short-lived, likely due to programs that attempted to alleviate this adverse effect. These pieces of evidence support an interpretation that forbearance programs supported borrowers adversely affected by COVID-19 event, but incentives should be built in to encourage exits to facilitate wealth accumulation.

Introduction

Mortgage forbearance programs in which borrowers can pause the monthly payment were a prominent and integral part of the broad relief programs enacted by Congress and government agencies, besides the accommodating fiscal and monetary policies, in response to the sharply rising

unemployment rate caused by the containment measures during the COVID-19 pandemic.¹ With the benefit of hindsight, the housing market turned out to be robust and may have contributed to the broad economic recovery amid the arrival of vaccinations and the associated economic reopening by end of 2020.

Understanding the effects of COVID-19 mortgage forbearance programs, including borrowers' entry, payment behavior, exits, and post-exit performance, is crucial for several reasons.² For lenders or investors, understanding the borrower characteristics and behavior is instrumental to accurately forecast credit risk, set the right reserves, and make the appropriate credit provision decision. For servicers, understanding the characteristics of those who remain in the forbearance would help servicers offer targeted loss mitigation options. For policy makers, understanding the heterogeneity effect across the spectrum of borrower income, neighborhoods, etc., besides the overall effect on the mortgage and housing market, is critically important in evaluating the effect of such programs on wealth accumulation.

There is a burgeoning literature on the effect of COVID-19 forbearance programs (Farrell, Greig, and Zhao, 2020; Cherry et al., 2021), and this report makes a unique contribution by examining first-lien residential mortgage data from the largest 18 bank servicers.³ Farrell, Greig, and Zhao (2020) use loan level mortgage data serviced by Chase Bank that is merged with the checking accounts of the borrower in the bank. Cherry et al. (2021) use credit bureau data and examine both mortgages and credit cards. The rich information from the bank servicers allows accurate identification of COVID-19 forbearance entry and exit as well as forms of exits. In addition, the data have unique features, including how banks manage the costs of servicing forbore Federal Housing Administration (FHA)/Veterans Administration (VA) loans.

This report uses FRB Y-14 data, which collect detailed loan- and borrower-level information from the largest depository mortgage servicers. As of December 2020, these data report close to 17 million mortgage loans totaling \$3.4 trillion, approximately one-third of the U.S. mortgage market. Studies utilizing data on residential mortgages serviced by banks also help to better understand the behavior of banks amid sharply rising role of non-banks.⁴

¹The Coronavirus Aid, Relief, and Economic Security Act (CARES Act), signed into law on March 27, 2020, created a forbearance program for federally backed mortgage loans and protected borrowers from negative credit reporting due to loan accommodations related to the COVID-19 national emergency declared by the President on March 13, 2020. On April 7, 2020, a revised inter-agency statement, in *OCC Bulletin* 2020-35, was issued to provide information to financial institutions that work with affected borrowers, including borrowers in non-federally backed residential mortgages. Note that although borrowers can suspend monthly payments without penalty (including the negative credit reporting) during the forbearance period, borrowers are expected to pay back the forbore amount eventually.

²Entry refers to mortgage borrowers' decision to sign up for the forbearance program; exit refers to the ending of the forbearance period. CARES Act prescribed eligibility periods for federally backed loans, while servicers can decide on the duration with renewal options for privately held residential mortgages.

³Other highly related articles include Agarwal et al. (2020) and Gerardi, Lambie-Hanson, and Willen (2021), which focus on heterogeneity across borrowers in refinance and wealth accumulation in the COVID-19 era. An et al. (2021) examine the borrower payment behavior by race and income during the COVID-19 pandemic. Capponi et al. (2021) investigate the effect of COVID-19 forbearance on refinance. Anderson, Harrison, and Seiler (2021) use an experimental design to examine strategic forbearance. Fuster et al. (2021) examine the credit supply in the U.S. mortgage market during the COVID-19 pandemic.

⁴Refer to Kim et al. (2018), Buchak et al. (2018), e.g., for studies on the rising role of nonbanks in the U.S. mortgage servicing and origination markets.

For macroeconomic variables, this study focuses on unemployment rates both nationally and locally. COVID-19 infection hotspots and the resulting containment measures, such as shelter-in-place, caused economic shocks. Although many people were able to work from home, others (particularly those in the travel, entertainment, and hospitality industries) were laid off or had work curtailed. The unemployment rate variable at county level from the Bureau of Labor Statistics helps capture the unemployment risk that a borrower faces.

Analyses of the data yielded the finding that forbearance entry was higher in areas with greater unemployment and for borrowers with lower credit scores. Analyses of the data indicated that a significant portion of borrowers under COVID-19 forbearance continued to pay. On forbearance exits, data analyses showed that the early exits from forbearance were borrowers with higher credit scores, and those facing improving employment conditions exited faster.

Empirical analyses yielded the finding that the entry sensitivity to unemployment shock was greater for higher credit-score borrowers and in neighborhoods with a greater percentage of higher-income households. Forbearance exit sensitivity to improving employment conditions was greater for lower credit-score borrowers. These pieces of evidence together are consistent with an interpretation that, although forbearance helped those adversely affected by the economic fallout from COVID-19, it also benefited borrowers with greater means to shoulder such shocks.⁵

Forbearance exits took many forms. Some borrowers reinstated and paid all forborne amounts before they exited. A large portion of them exited by deferring the forborne payments with two types: 1) deferring the forborne amount to a balloon payment until earlier of maturity, refinancing, or the loan pay-off date; and 2) extending the contractual maturity to allow for missed payments to be collected. Some received modifications with rate change, term change, or both.

Most of the borrowers who exited the forbearance were current after the exits—they were able to make monthly payments after the exits, likely assisted by the COVID-19 deferral programs and the improving labor market. Their serious delinquency rate was higher, however, than that of the group that never went into COVID-19 forbearance, reflecting the additional risk factors of these borrowers. One group particularly contributed to the elevated serious delinquency rate of forbearance exits—borrowers who were late in payments before the entry into forbearance.

One potential downside of forbearance and the nonpayment it affords is that it might adversely affect the borrower's ability to refinance given the history of nonpayment (under forbearance). Evidence supporting this was found. However, government agencies, including government-sponsored enterprises (GSEs), put out programs to support refinancing after borrowers exited. Analyses of data found evidence that the adverse effect of forbearance on refinancing was short-lived.

It was also found that banks, for FHA/VA loans in Ginnie Mae (GNMA) securities, used buyouts to manage nonpaying FHA/VA loans under forbearance. Such nonpayment by borrowers meant that servicers needed to advance payment to investors. The data indicated that servicers bought out

⁵Evidence was found that borrowers who were late in payments before the COVID-19 pandemic joined forbearance, effectively obtaining a respite brought about by the forbearance program established in this pandemic.

such loans from GNMA securities and put them on their own book, avoiding the need to advance payments to investors in a declining interest rate environment.

The remainder of this report proceeds as follows. First, the data and the sample are presented. Then, forbearance entry decision is examined, followed by borrower payment behavior and exit decision and post-exit performance. After that, the effect of forbearance on refinance likelihood is examined, followed by an investigation of how servicers manage the cost of servicing FHA/VA loans via the buying out from GNMA pools. Concluding remarks end the report.

Data, Sample, and Variable Constructs

Data

This study uses FRB Y-14 (or Y-14) first lien mortgage loans reported monthly by the largest 18 bank servicers. Covering both the bank-held or serviced loans that are updated monthly with a lag of around 2–3 months, the Y-14 data contain a rich set of borrower- and loan-level variables both for origination and for loan performance including delinquency status, loss mitigations, and liquidations, etc.

Since the focus of the study is on the COVID-19 pandemic, the Y-14 data were utilized for the period from February 2020 until the most recent performance updates. To facilitate data analyses, a 10-percent random sample was constructed: a random 10 percent sample was selected for the snapshot of loans active as of February 2020, and their performances were followed; to incorporate originations after February 2020, a random 10 percent sample for originations in each following month was selected, and their performances at monthly frequency were tracked.⁶

Panel A of exhibit 1, in the right y-axis, shows that the number of active loans in the Y-14 data declined from 18.1 million in March 2020 to 16.2 million in December 2020; the visible decline in loan counts in Y-14 data reflect the significant number of refinancing, especially by nonbanks, amid the unprecedented low interest rates starting in March 2020.

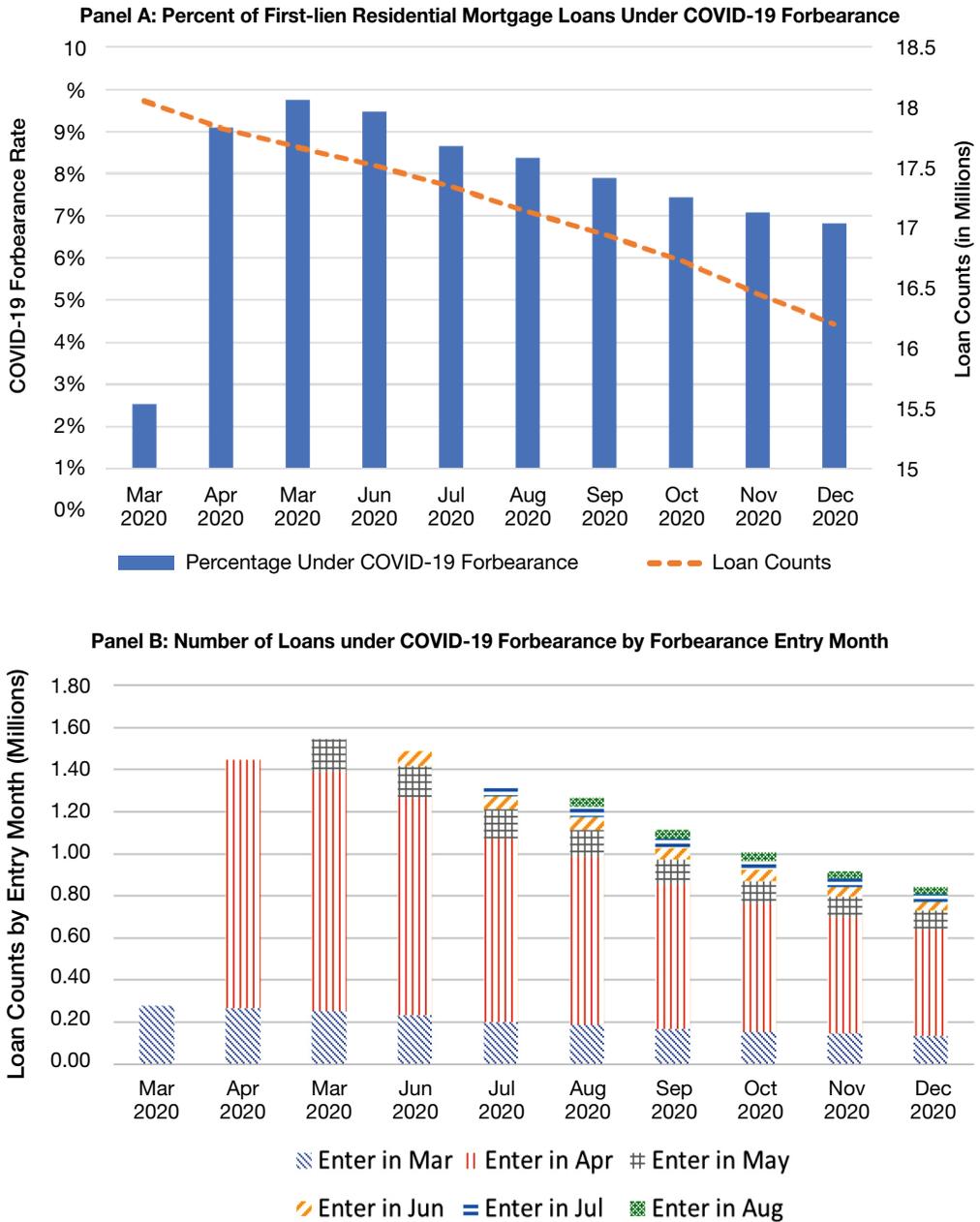
A key task was to identify the COVID-19 related forbearance. With the CARES Act enacted in March 2020, an interagency guidance was issued to servicers on the reporting of COVID-19 forbearance (and reporting of payment behavior while under forbearance to the credit bureaus). Servicers were instructed to record the COVID-19 forbearance under the variable “Loss_Mit_Performance_Status.” However, because there were loans under loss mitigation prior to March 2020, such loans were not counted as COVID-19 forbearance.⁷

⁶ Numbers reported in the exhibits are adjusted from the results taken directly from the random sample. For example, the loan counts reported in the exhibits are 10 times that of the loan counts of the random sample.

⁷ The interagency Guidance did not specify whether loans under loss mitigation in March 2020 shall be treated as COVID-19 forbearance or not. The data indicated a reasonable jump in loans under loss mitigation in March. The baseline treatment was that such loans counted towards COVID-19 forbearance. The overall results changed little from an alternative treatment that these March 2020 loans did not count as COVID-19 forbearance.

Exhibit 1

Forbearance Rates and Numbers by Calendar Month



Sources: FRB Y-14 data with observation months from February 2020 to December 2020

Panel A of exhibit 1, in the left y-axis, shows the percent of first-lien residential mortgages under COVID-19 forbearance each month since March 2020. Consistent with the forbearance statistics from the Mortgage Banker Association, Black Knight, Inc., and Urban Institute, the percentage sharply jumped in April, peaked in May, and has since declined due to exits and fewer entries, as also shown in Panel B of exhibit 1, where loan counts under forbearance are plotted by entry month.

This pattern of forbearance applies to all investors and loan types. For the conventional first-lien mortgages serviced by the 18 largest bank servicers, the largest block, GSE, saw a significant decline in loans under forbearance (the peak number of 0.85 million in May 2020 declined to 0.42 million by December 2020), and so did conventional loans in private-label securitizations (or PLS) and bank-held portfolio as well as nonconventional loans with government mortgage insurance (FHA, VA, United States Department of Agriculture, etc.)

The total number of loans under forbearance, however, is the result of both forbearance entry and exits. To further understand and assess the impact of forbearance, forbearance entry and exit were examined, separately, under the next two subheadings.⁸ The loan level data were also merged with various data sources to obtain macro-economic variables and geographic/demographic variations. For unemployment variables, the county-level unemployment rate variables from the Bureau of Labor Statistics (BLS) were utilized. For variables that capture zip-level percentage of higher income households, the 2019 American Community Survey dataset was used.

Sample and Variable Constructs for Forbearance Entry Analyses

Constructing the sample for examining entry into COVID-19 forbearance involved keeping all observations from the raw data except for removing observations after a loan enters the forbearance. The dependent variable, `forbearance_entry`, will take the value of 1 in the month a loan enters forbearance.

The CARES Act mandated that COVID-19 forbearance be readily available for federally backed residential mortgage loans, which include residential mortgage loans in GSE-guaranteed mortgage-backed securities (MBS) and FHA- or VA-insured mortgage loans typically packaged in GNMA MBS.⁹ Bank-held loans or those in private label mortgage-backed securities (PLS) were not required by law to grant COVID-19 forbearance. Examining COVID-19 forbearance by investors was thus informative. Row 1 of exhibit 2 shows that GSE and portfolio loans had similar level of forbearance, whereas those for GNMA and PLS were higher. The forbearance entry rate for loans bought out from GNMA securities was particularly high; this is not surprising because servicers, by GNMA rules, typically buy out nonpaying loans, including nonpaying loans under COVID-19 forbearance that were contractually 90+ days past due (DPD).

⁸The COVID-19 forbearance entry analyses used data from February 2020 to December 2020. The analyses on COVID-19 forbearance exits and particularly loan performance after forbearance exits utilized the data with the latest monthly—July 2021—performance update.

⁹H.R. 748 - CARES Act.

Exhibit 2

Summary Statistics of Sample for Forbearance Entry Analyses

Variable	Total (%)	GSE (%)	GNMA (%)	PLS (%)	Portfolio (%)	GNMA Buyout (%)
Under forbearance	1.1	0.9	1.8	2.2	1.0	4.8
Investor	100.0	64.0	14.2	2.8	16.1	0.7
FICO_Current Less than 579	3.6	1.7	6.9	16.0	3.0	48.9
580–619	2.5	1.3	5.7	9.1	2.0	13.5
620–679	7.0	4.9	14.7	17.1	5.6	14.6
680–719	9.1	8.0	14.4	13.3	7.4	5.0
720–759	13.9	13.7	16.5	13.6	13.1	2.7
760+	60.9	68.3	38.8	27.6	62.6	1.7
Missing	3.0	2.0	2.9	3.2	6.4	13.7
Refreshed LTV >=80	7.4	6.1	13.5	9.2	5.8	12.6
Debt to income less than 0.15	22.2	23.1	13.5	37.2	25.7	8.0
0.15–0.21	19.3	21.1	16.3	7.9	18.3	11.2
0.21–0.29	20.7	21.4	20.3	12.1	20.3	20.6
0.29–0.41	14.7	14.5	14.5	12.9	15.4	18.1
> 0.41	3.4	3.8	2.7	3.6	2.4	3.5
Missing	19.6	16.0	32.8	26.3	17.9	38.6
Loan type: Conventional w/o PMI	69.2	81.1	0.0	78.5	85.9	0.1
FHA	11.7	0.1	69.8	8.6	2.6	80.6
VA	3.7	0.0	23.7	1.3	0.5	12.9
Conventional w/ PMI	12.9	18.7	0.0	5.5	3.3	0.4
Loan Purpose: Purchase	41.2	35.8	63.2	43.0	39.9	74.5
Refi: rate	35.4	39.9	23.8	17.2	33.0	17.7
Refi: cash-out	19.0	20.0	7.3	37.3	22.7	6.8
Refi: home improvement	1.7	1.8	0.9	1.2	2.0	0.1
Loan Product: FRM 30 year	69.0	69.0	92.4	61.5	48.0	80.2
FRM 15 year	21.9	27.6	5.0	3.0	19.5	2.1
FRM 40 year	1.9	1.1	1.3	7.6	3.7	15.0
ARM	5.5	2.0	1.3	18.0	20.8	2.2
Occupancy: Primary Residence	89.2	87.5	96.8	85.3	89.0	98.9
Secondary home	4.1	4.7	0.1	2.6	6.0	0.1
Investment property	5.8	7.2	0.9	8.7	4.5	0.4
Loan Source: Retail	49.8	51.6	31.2	26.1	66.1	24.1
Broker	4.4	2.8	4.5	24.4	6.2	7.3
Correspondent	31.3	31.4	56.4	17.4	10.0	59.9
Interest Only: Yes	1.6	0.2	0.0	13.6	6.5	0.0
Balloon Payment: Yes	0.2	0.0	0.0	2.3	0.7	0.0
Documentation: Full	78.3	77.4	80.9	42.4	86.5	86.6
Negative Amortization: No	99.0	99.8	100.0	90.3	96.4	99.6
Prepayment Penalty: Yes	1.9	0.1	0.0	10.0	9.5	0.0
Unemployment rate	8.5	8.5	8.1	9.2	8.8	8.5
Pct_HHInc_abv_75k_zip	64.8	65.6	57.8	61.0	69.4	55.4

GSE = government sponsored enterprises. LTV = loan to value ratio. PLS = private-label securitizations. PMI = private mortgage insurance.

Note: Proportions may not sum to 100 percent as there are "other" categories.

Sources: 10 percent sample of FRB Y-14 data, Feb. 2020–Dec. 2020; Bureau of Labor Statistics; 2019 American Community Survey

In order to capture potentially nonlinear relationships between borrower credit scores and forbearance entry, borrower's current FICO scores were binned according to broadly accepted cutoff levels. More than 60 percent of loan-month observations were for borrowers with a FICO score greater than 760, suggesting that the largest national banks increasingly held on-book or serviced borrowers with pristine credit scores after the 2008 financial crisis.

In terms of investors, 64 percent of loan-month observations were for conventional loans in GSE, 14 percent in GNMA, 16 percent in portfolio, and 3 percent for PLS. In terms of loan type, around 81 percent of GSE loans were conventional loans without private mortgage insurance (or PMI). Close to 70 percent of GNMA loans were FHA. Close to 89 percent of bank-held loans were conventional loans, with 3 percent being FHA/VA. The majority of loans in early buyouts (EBO) were FHA/VA loans.

The share of borrowers with a current FICO score at or above 740 were highest for GSE and portfolio loans, much lower for GNMA and PLS loans, and were close to be 0 for EBO loans. Of particular interest is that the portion with current credit scored lower than 680 in EBO loans was close to one-half (more on EBO later in this report).¹⁰

The variation in the share of loans in refreshed loan-to-value ratio (LTV) above 80 percent is much less across investors. Across all investors, only 7.3 percent had a refreshed LTV greater than 80 percent, reflecting the recovering house market after the 2008 Great Financial Crisis and the robust housing market through the pandemic. Only 6 percent of GSE and portfolio loans were of LTV greater than 80 percent, as were 13 percent of GNMA and 11 percent of EBO loans. Variation across investor type on debt-to-income ratio (DTI) is large. For example, the share of missing DTI was 20 percent for all, 16 percent for GSE, 18 percent for portfolio, 33 percent for GNMA, and 39 percent for EBO loans.

Approximately 54 percent of loan-month observations were for refinance purpose; 41 percent were for purchase loans; GSE had the highest in refinance at 40 percent in rate or term refinance and 20 percent in cash-out refinance; and GNMA (and EBO) loans had a higher proportion of purchase loans, reflecting their mission of supporting first-time homebuyers. Close to 90 percent of all loans were fixed rate; portfolio loans had 21 percent in adjustable-rate loans, with PLS loans coming the second at 18 percent.

Three-fourths of the loans were for single-family detached residences, 8 percent for condos, 7 percent for townhouses, 3 percent for multifamily residential units (2- to 4-units), 5 percent for planned unit development, and 1 percent for manufactured homes. Close to 90 percent of loans were for primary residences, 4 percent were for second homes, and 6 percent were for investment properties.

Sources of loan origination vary across investor type. GSE loans had 52 percent originated via direct retail channel and 32 percent from correspondent channel. Bank-serviced GNMA loans sourced heavily from correspondent channels at 56 percent, with direct retail channels at 31 percent, suggesting a reliance on the correspondent channel for agency loans. For portfolio loans,

¹⁰ Current FICO have missing values for two reasons: a borrower does not have a FICO score or borrowers may miss their current FICO in certain months. The majority of the cases in the data are the former.

two-thirds were originations via direct retail channel. PLS loans have a high percentage of broker originated loans, reflecting the prominent broker channel for loans originated prior to the 2008 financial crisis.

Ten percent of all loans have unpaid principal balance (UPB) greater than \$379,000. However, the share was much larger, at 38 percent, for portfolio loans, reflecting that banks hold jumbo loans on their books. On the contrary, close to 90 percent of GNMA loans had a UPB lower than \$231,000.

The seasoning of loans across investor type varies. Nearly 89 percent of PLS loans were originated more than 10 years ago, reflecting in general their originations prior to the 2008 financial crisis; portfolio loans had a higher percentage of less than 1 year of seasoning, reflecting that a newly originated loan typically stays on the bank's book for a few months before being sold to GSE or packaged into GNMA securities.

Interest only loans were only 2 percent of all loans; the rate was higher at 14 percent for PLS loans and 7 percent for portfolio loans. Loans with balloon payment features were close to zero, but the rate was 2.3 percent for PLS loans. Close to 78 percent of loans were full-documentation loans, with a lower level at 42 percent for PLS loans. Similarly, loans with negative amortization features were at 1 percent, but the rate was 10 percent for PLS loans and 4 percent for portfolio loans. The payment option ARM percent for all was 1 percent, but 9 percent for PLS and 3 percent for portfolio loans. Lastly, 2 percent of all loans had prepayment penalty clauses, but 10 percent of PLS and 9.5 percent of portfolio loans had such clauses.

On community-level variables, the number of mortgage borrowers having distinct levels of household income from the 2019 American Community Survey (ACS) were used to construct a variable measuring the percentage of households having annual income greater than \$75,000. This variable was constructed at the ZIP Code level. Across the 31,623 ZIP Codes, the mean was 52 percent (the median is 53 percent). That is, in an average ZIP Code, 52 percent of households carrying a mortgage had an annual income above \$75,000 in 2019. These data were then merged with the main analyses sample at ZIP Code-level with 99.8 percent of loan-month observations being matched.

The resulting data show that an average loan in the final data was in a ZIP Code where 65 percent of households had an annual income greater than \$75,000 in 2019. An average GNMA loan was in a ZIP Code where 58 percent of households had an annual income greater than \$75,000; an average portfolio loan was in a ZIP Code with 69 percent having an annual household income greater than \$75,000.

The unemployment data were sourced from U.S. Department of Labor; the most granular were at the county level. The mean unemployment rate (weighted by labor force) across February 2020 to December 2020 was 8.4 percent. This county-month level data were then merged with the loan-level sample, which had a ZIP Code identifier, using the ZIP-county crosswalk file available through HUD. Shown in the last row of exhibit 2, the mean unemployment rate across all loan-months was 8.5 percent.

Sample and Variable Constructs for Forbearance Exit Analyses

Constructing the data to examine exit from COVID-19 forbearance entails keeping the loan-month observations for those who ever entered COVID-19 forbearance for the months after they entered forbearance. The dependent variable, `forbearance_exit`, takes the value of 1 in the months when and after a borrower exited the forbearance.

The pattern of the borrower- and loan-level characteristics for the exit sample is distinct from that for the forbearance entry analyses sample. For example, in the exit analyses sample, 41 percent of GSE loans and 38 percent of borrowers had current FICO scores greater than 760, while those numbers were 68 percent and 63 percent, respectively, in the entry analyses sample (reflecting the overall sample to a large degree). This suggests that disproportionately more borrowers with lower FICO scores entered the forbearance; it also shows that even borrowers with high FICO scores entered forbearance. The following section investigates this in more depth.

Forbearance Entry

Bivariate analyses were conducted on relationships between COVID-19 forbearance entry and contributing factors, followed by multivariate regression analyses.

Bi-Variate Analyses

How COVID-19 forbearance entry responded to sharply rising unemployment rates was examined first, followed by an investigation of how the pattern varied across borrowers by credit scores.

A. Forbearance Entry and Unemployment Shock

The time-series correlation between the national forbearance rate and the national unemployment rate was examined first. Panel A of exhibit 3 shows that the increase in forbearance entry directly coincided with the increase in unemployment: The largest forbearance entry was in April 2020—1.2 million borrowers entered forbearance in April, and 0.2 million entered in May, whereas the national unemployment rate climbed from 6.9 percent in March to 11.1 percent in April and 13.9 percent in May before it started subsiding in June 2020.

Exhibit 3

Forbearance Entry by Unemployment Rate and Borrower FICO (1 of 2)

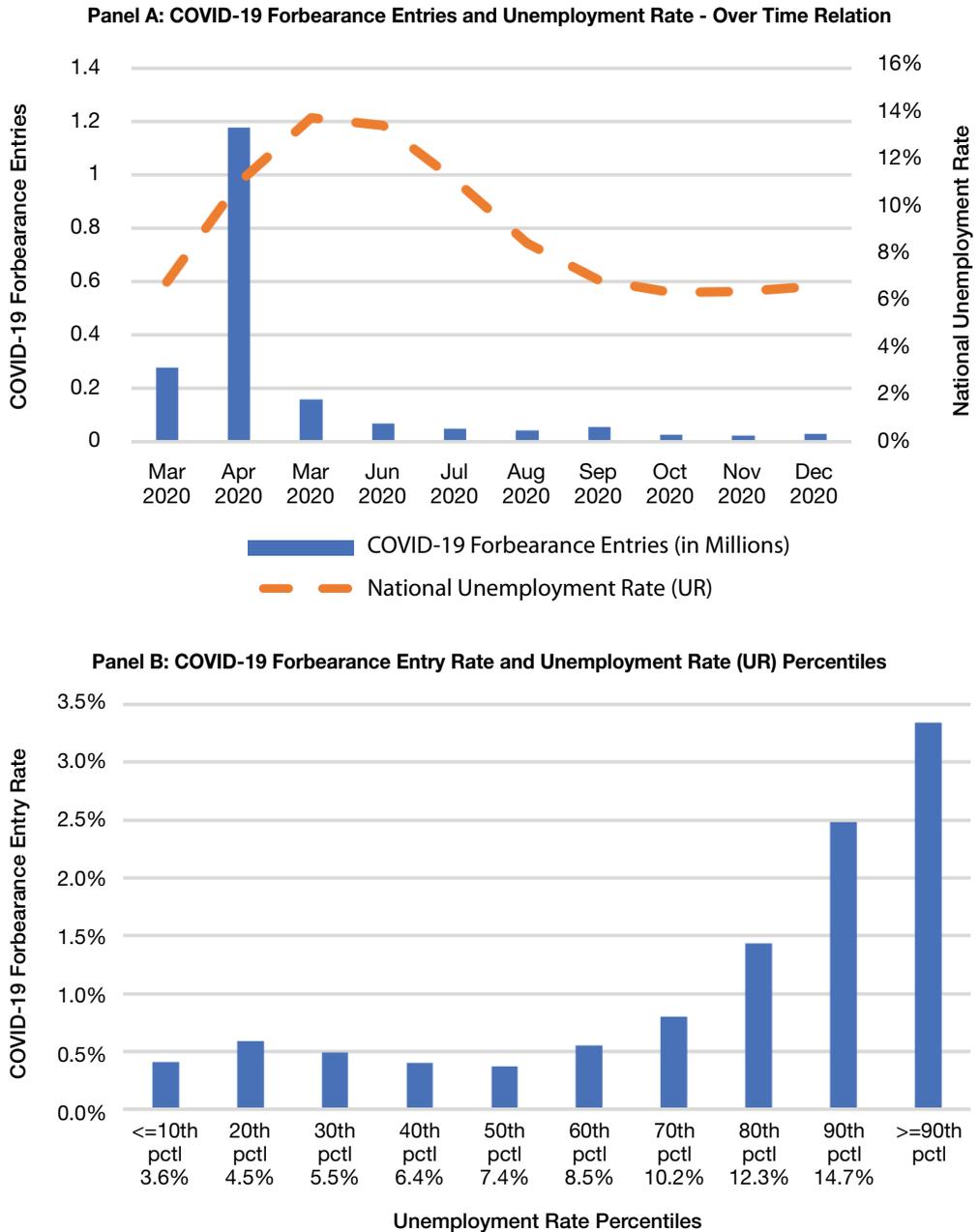
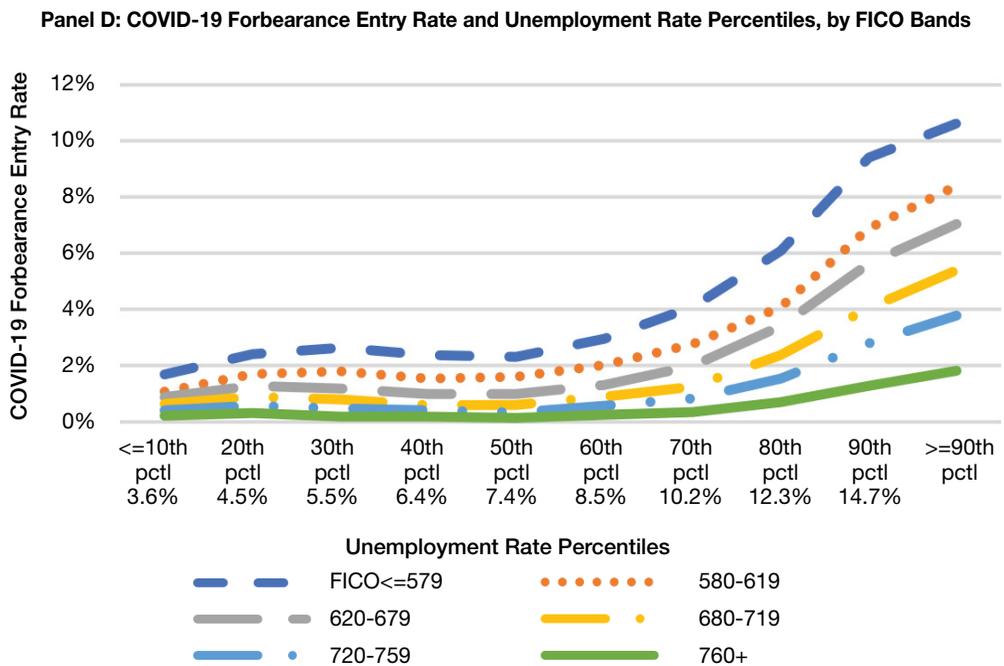
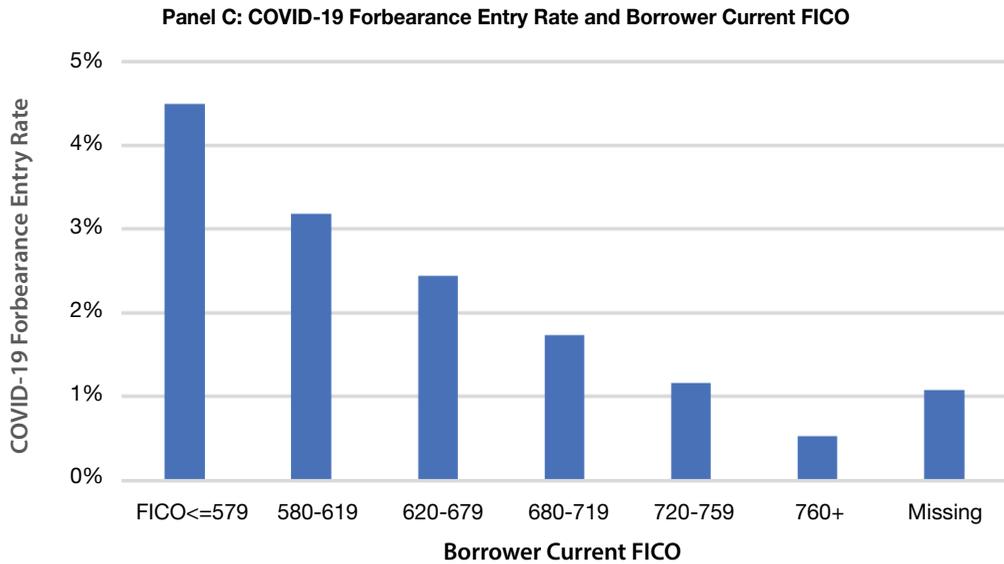


Exhibit 3

Forbearance Entry by Unemployment Rate and Borrower FICO (2 of 2)



Sources: FRB Y-14 data with observation months from February 2020 to December 2020; Bureau of Labor Statistics

Panel B of exhibit 3 plots the forbearance entry rate by the deciles of the unemployment rate variable. That is, all loan-month observations were pooled, and 10 deciles were created by the level of the unemployment rate variable. Therefore, the variation across the deciles included both

the time-series and the cross-sectional (across county/ZIP) variation. For county-months that experienced unemployment rates ranging from fifth decile (or 50th percentile) of 7.4 percent to the ninth decile (or 90th percentile) of 14.7 percent or higher, the forbearance entry rate increased significantly with the unemployment rate. The forbearance entry rate for those areas with lower levels of unemployment rate was relatively flat.

B. Forbearance Entry and Borrower Credit Score

Panel C of exhibit 3 plots the forbearance entry rate as a function of the borrower's current FICO score. Borrowers with lower refreshed FICO scores entered forbearance significantly more often than those with higher scores; for example, borrowers with FICO scores lower than 579 have a forbearance entry rate that is 9 times of that of borrowers with FICO scores greater than 760.¹¹

C. Forbearance-Unemployment Sensitivity as a Function of FICO

Of particular interest is the heterogeneity in borrowers' forbearance entry response to the unemployment shock. Is it stronger for borrowers with lower credit scores because they likely benefit more from the payment respite provided by the forbearance? Panel D of exhibit 3 offers a visual inspection of this relationship. These data confirm that borrowers with lower credit scores utilized the forbearance more. These data also confirm that the entry rate was higher when unemployment rate was higher.

Panel D of exhibit 3 also shows that while lower FICO borrowers utilized forbearance more in response to higher unemployment rates, the relative responsiveness was slightly greater for higher-scoring FICO borrowers. For example, for borrowers with the lowest credit score, the forbearance rate changed from 1.7 percent to 10.6 percent, an increase of 5.4 fold when the unemployment rate moved from lower than 3.6 percent to greater than 14.7 percent, and the forbearance rate for the highest-scoring FICO group was from 0.2 percent to 1.8 percent, an increase of 7.3 fold.¹²

Econometric Regression Analyses

While the bivariate relationships between forbearance entry and borrower credit scores as well as unemployment rates are presented, the relationship abstracts from the difference in many other borrower and loan characteristics. Regression analyses were thus conducted where these characteristics were included. Summary statistics of these variables are presented in exhibit 2.

The following equation was estimated to examine factors that affect COVID-19 forbearance entry:

$$\ln\left(\frac{p_{ict}}{1 - p_{ict}}\right) = \beta_x X_{i,t} + \beta_u UR_{c,t} + \gamma UR_{c,t} * X_{i,t} + \alpha_s + \alpha_{sv} + \varepsilon_{ict} \quad (1)$$

¹¹ Not reported in tables or figures, the pattern slightly changes for FHA borrowers, mainly for the lowest FICO bands, reflecting the heterogeneity in forbearance entry by loan type (and various dimensions).

¹² Another dimension not present in the exhibits is the borrowers who were already delinquent prior to their entry to COVID-19 forbearance. Comparing noncurrent ones that entered forbearance with current ones that entered yielded the finding that the formers' FICO was approximately 100 points lower than the latter groups.

where

p =probability ($Enter=1$) where Enter changes from 0 to 1 when a borrower enters COVID-19 forbearance;

i is loan; c is county; t is month;

X : borrower-, loan-, or community-level characteristics as detailed in exhibit 2;

UR : county-level unemployment rate (merged to zip-level in Y-14);

s : state; sv : servicer

State and servicer fixed effects are included in the baseline specification to capture time invariant state- and servicer-level heterogeneity in forbearance practices. Since the dependent variable is an indicator variable, the equation was estimated using a logistic regression—the dependent variable in the regression is the log of odds of entering COVID-19 forbearance.

Panel A of exhibit 4 presents the estimation results on forbearance entry using the full sample. Column 1 shows the result from the baseline specification, columns 2 and 3 add the unemployment variable interacting with the borrower FICO and community-level variable, respectively. Each specification shows the coefficient estimate and the robust standard error (StdErr).

Exhibit 4

Regressions on COVID-19 Forbearance Entry (1 of 2)							
Panel A: Full Sample—All Investors							
Variable	Class	(1) Estimate	StdErr	(2) Estimate	StdErr	(3) Estimate	StdErr
Intercept		- 4.72***	0.19	- 4.68***	0.19	- 4.63***	0.20
FICO_Current (lag)	580–619	0.53***	0.01	0.65***	0.02	0.53***	0.01
(omitted group: <580)	620–679	0.40***	0.01	0.39***	0.01	0.40***	0.01
	680–719	0.10***	0.01	- 0.01	0.01	0.10***	0.01
	720–759	- 0.26***	0.01	- 0.43***	0.01	- 0.26***	0.01
	760+	- 0.97***	0.01	- 1.18***	0.01	- 0.98***	0.01
	Missing	- 0.40***	0.01	- 0.28***	0.03	- 0.40***	0.01
Unemployment Rate (UR)		0.15***	0.00	0.14***	0.00	0.12***	0.00
UR*FICO_Curr (lag)	580–619			- 0.01***	0.00		
	620–679			0.00	0.00		
	680–719			0.01***	0.00		
	720–759			0.01***	0.00		
	760+			0.02***	0.00		
	Missing			- 0.01***	0.00		
Pct_abv_75k (zip)						- 0.19***	0.04
UR*pct_abv_75k						0.06***	0.00
Servicer, State fixed effects		Yes		Yes		Yes	
AUC		0.814		0.815		0.81	
Observations				17.7 Million			

Exhibit 4

Regressions on COVID-19 Forbearance Entry (2 of 2)

Panel B: Sub-Sample Analyses of COVID-19 Forbearance Entry—by Investors

Variable	Class	GSA		FHA/VA		Portfolio		PLS	
		Estimate	StdErr	Estimate	StdErr	Estimate	StdErr	Estimate	StdErr
Intercept		-4.36***	1.09	-6.96	59.09	-6.29	41.05	-32.83**	14.13
FICO_Current (lag)	580-619	0.78***	0.03	0.61***	0.03	0.52***	0.06	0.30***	0.07
(omitted: <580)	620-679	0.46***	0.02	0.34***	0.02	0.29***	0.04	0.17***	0.05
	680-719	0.06***	0.02	-0.14***	0.03	0.13***	0.04	-0.01	0.06
	720-759	-0.38***	0.02	-0.51***	0.03	-0.36***	0.04	-0.36***	0.07
	760+	-1.15***	0.02	-1.23***	0.03	-1.06***	0.03	-0.78***	0.06
	Missing	-0.61***	0.05	-0.01	0.04	-0.28***	0.07	0.08	0.12
Unemployment Rate (UR)		0.15***	0.00	0.14***	0.00	0.14	0.00	0.15***	0.00
UR*FICO_Curr (lag)	580-619	-0.02***	0.00	-0.01***	0.00	-0.01***	0.00	0.00	0.00
	620-679	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00
	680-719	0.01***	0.00	0.01***	0.00	0.00***	0.00	0.01***	0.00
	720-759	0.01***	0.00	0.01***	0.00	0.02***	0.00	0.02***	0.00
	760+	0.02***	0.00	0.02***	0.00	0.01***	0.00	0.02***	0.00
Servicer, State FE		Yes		Yes		Yes		Yes	
AUC		0.812		0.794		0.82		0.77	
Observations		10.1M		2.40M		2.45M		0.44M	

AUC = Area under the ROC curve. GSE = government sponsored entities. FE = fixed effects. FHA = Federal Housing Administration. VA = Veterans Administration. PLS = private-label securitizations.

* = statistically significant at 10 percent level. ** = statistically significant at 5 percent level. *** = statistically significant at 1 percent level.

Note: Borrower/loan attributes have been included.

Source: 10 percent sample of FRB Y-14, February 2020–December 2020

Across the three specifications in Panel A, borrowers with greater credit scores utilize forbearance less. For example, borrowers with FICO scores greater than 760 (lagged 1 month), controlling for the explanatory variables, have a log-odds ratio of entering forbearance that is 0.97 lower than those with scores lower than 579 (the omitted group). This relationship is consistent with an interpretation that borrowers with greater scores had a less need for payment forbearance in face of pandemic-induced economic disruption.¹³

The unemployment shock unleashed by the response to the pandemic has a large impact on borrowers' forbearance entry. The estimated coefficient on the unemployment rate variable (in percent), 0.15, suggests that moving from a 25th percentile level of 5.0 percent to a 75th percentile of 11.2 percent is associated with an increase in log-odds of forbearance entry of $0.15 * 6.2 = 0.93$,

¹³ Shown in exhibit 4 is also the finding that borrowers with missing FICO have a lower COVID-19 forbearance entry rate (relative to borrowers with the lowest FICO scores). Shown in later exhibits, once entering COVID-19 forbearance, this group had lower exit rates and higher serious delinquency rates (relative to borrowers with FICO lower than 680). This is likely because these borrowers had a lower likelihood to apply for the COVID-19 forbearance or had a lower response rate to servicers.

a level comparable to the log-odds difference between borrowers with credit scores below 579 versus above 760.¹⁴

Other explanatory variables are of expected signs (estimated coefficients are reported in appendix exhibit A1). Borrowers with greater LTV ratios utilize forbearance more, but the impact of the LTV variable is of lower magnitude than that of FICO variation. Borrowers with greater debt-to-income ratios utilize forbearance more, reflecting a potentially greater need for support in case of an unemployment shock. The investor of the loan turns out to have little impact on forbearance utilization, possibly because other borrower and loan characteristics capture the key variations and because servicers offered forbearance to privately held loans as well. Compared with conventional loans, FHA loans have higher forbearance rates, consistent with their greater need for forbearance support due to the generally lower income of FHA loan borrowers.

Estimated coefficients in exhibit A1 also indicate that mortgages for investment purpose have higher forbearance rates than those for primary residences, and broker-originated mortgages are associated with a greater forbearance rate. Compared with 30-year terms, those having 15-year terms had lower forbearance rates. Loans with low- or no-documentation had higher forbearance rates than full-doc loans, and so did mortgages with negative amortization product features.

Do borrowers already late in payments utilize forbearance? According to the CARES Act, as long as borrowers experience hardship due to the pandemic, they can qualify. Therefore, a borrower already late in payment could utilize this support; indeed exhibit A1 shows that borrowers with a delinquency in past months have a greater likelihood of entering forbearance.

Column 2 of Panel A reports regression results on how borrowers' forbearance responses to unemployment shock vary with borrower characteristics using an econometric specification interacting the unemployment variable with the FICO category variables. The finding is that the compared with borrowers with FICO scores lower than 580, those with scores 680–719, 720–760, and especially above 760 have additional forbearance responsiveness to unemployment—the log-odds of forbearance entry response to unemployment for those with FICO 760+ is higher by an additional 0.02 on a base of 0.17. This regression result thus resonates with the visual presentation in Panel D of exhibit 3.

These results from this forbearance entry analysis are consistent with an interpretation that while forbearance supported borrowers with the highest vulnerability, it also provided borrowers from the full credit score spectrum a means to weather the economic shock resulting from the pandemic, and borrowers with higher credit scores disproportionately utilized it.¹⁵ However, this result could be unique to these data, and it would be illuminative to see whether this holds for the broader mortgage market, including those serviced by non-banks.

¹⁴Not shown are results using the unemployment rate lagged by 1 month. The negative coefficient suggests that it is not what transpired in the labor market, but rather what has been transpiring that propels borrowers into forbearance. This evidence is thus consistent with interpretations that forbearance supported borrowers hit by unemployment, but it also provided a means to take precautionary action.

¹⁵The sample focusing on the period up to May 2020, when the forbearance entry was the most prominent, was also examined; the same pattern was found.

Communities vary in the proportion of mortgage holders whose household income is greater than \$75,000. ZIP Code-level variables and their interaction with the unemployment rate variables were thus included in the estimated equation. Not surprisingly, the finding is that the coefficient on the variable is negative; that is, mortgagees in higher-income ZIP Codes utilize forbearance less. The coefficient on the interaction term is positive, implying that the forbearance entry response to unemployment shock in wealthier communities is greater than those in less wealthy ones.

Sub-Sample Forbearance Entry Regression Analyses

Panel B of exhibit 4 presents results from sub-sample regression analyses of forbearance entry. GSE loans, FHA/VA loans, portfolio loans, and loans in PLS were examined separately.¹⁶ The focus was on the specification with unemployment and borrower credit score interaction. Across the sub-samples, the finding is that borrowers with greater credit scores have a lower likelihood of entering forbearance. In addition, the borrowers with greater credit scores are more responsive in their forbearance entry in face of the unemployment shock across the sub-samples.

Partly for brevity, coefficients on servicer fixed effects are not reported. The finding is that the coefficients on servicer fixed effects are statistically insignificant for bank-serviced loans in GSE securities, insured by FHA/VA, or in PLS, but they are significant for loans held in banks' portfolios. This reflects that 1) CARES Act mandated COVID-19 forbearance for federally backed loans, and GSE and HUD issued explicit guidelines for servicers to follow; 2) banks have greater discretion in providing relief programs to borrowers in loans held on their books; and 3) there are greater challenges and heterogeneity (including qualification requirements as well as duration of the forbearance and repayment options) in providing relief to mortgages in private label securities (Kaul, 2020).

Payment Under Forbearance, Forbearance Exit, and Performance Post Exit

Sample

In this section the focus is on the forbearance entrants' payment behavior, their exits, and performance after exits; therefore, the sample of analyses for this section are only borrower-month observations after the forbearance entrance month. The number of borrower-month observations as of December 2020 in the 10 percent sample is 1,532,116, reflecting the 1.9 million forbearance entrants since March 2020, with the reporting month ending December 2020. Approximately 1.0 million entrants have ever exited forbearance as of December 2020. A small portion, around 0.05 million, exited but re-entered forbearance. As of December 2020, 0.95 million, or 5.8 percent of active borrowers, remained under forbearance.¹⁷

¹⁶ This is not an exactly mutually exclusive way of dividing investors; however, this way helps highlight the party who ultimately bears the (credit) risk.

¹⁷ These numbers are very closely in line with what is reported by external vendors (given that banks serviced close to one-third of the U.S. market). For example, <https://occ.bulletinintelligence.com/briefing?d=2021-01-07&doctype=occ> reports that an estimated 2.7 million borrowers remained under forbearance then.

In constructing the sample for loan performance analyses after forbearance exits, loan-month observations after forbearance-exit month were used, and their loan performances were compared with the overall sample using all loan-month observations.

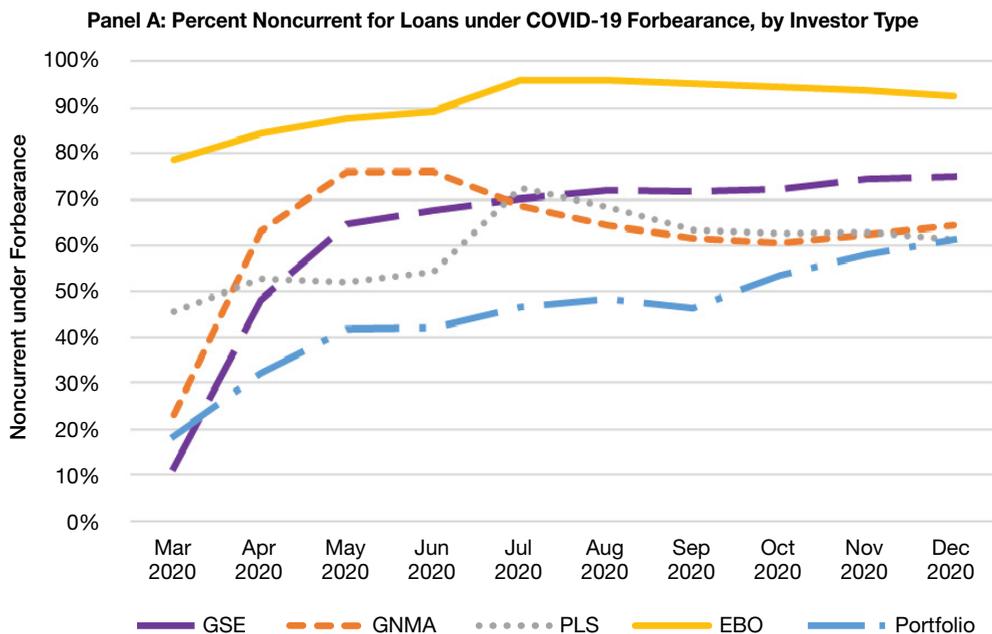
Borrower Payment Behavior under Forbearance

The goal of the forbearance program is to pause monthly payments and allow borrowers a respite before they can regain economic footing and resume payment. Nonpayment is thus expected; CARES Act mandates that nonpayment under COVID-19 forbearance shall not be reported as further delinquency to the credit bureau. Servicing platform data, such as Y-14 data, track contractual delinquency and is different from data reported to the credit bureaus.

Panel A of exhibit 5 shows the nonpayment rate by investor type over time.¹⁸ EBO loans had the highest nonpayment rate; the high nonpayment rate was probably a main driver for doing the buyouts by the servicer in the first place. GSE loans had a nonpayment rate of 62 percent in May 2020, implying that 38 percent of those under forbearance still were paying. The nonpayment rate declined to 32 percent in December 2020. Portfolio loans consistently had the lowest nonpayment rate over time; for example, close to 60 percent of those in forbearance paid in May 2020. The increase in nonpaying rate over time was true across investor types, likely reflecting the exits of those with greater ability to pay and the stay of borrowers with a lower ability (or willingness) to pay.

Exhibit 5

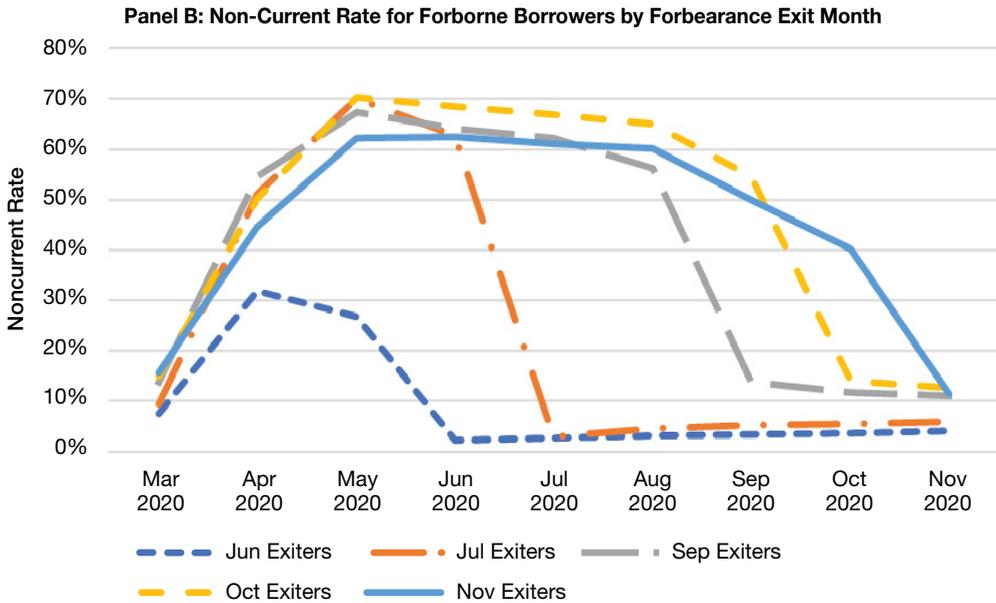
Borrowers' Payment Behavior under COVID-19 Forbearance (1 of 2)



¹⁸ In this subsection on payment behavior under forbearance, the nonpayment is used interchangeably with non-current.

Exhibit 5

Borrowers' Payment Behavior under COVID-19 Forbearance (2 of 2)



EBO = early buyout. GNMA = Ginnie Mae. GSE = government sponsored entities. PLS = private-label securitizations.

Notes: Non-current includes nonpayment under forbearance. EBO are loans bought out of GNMA securities pools. Jun exiters refer to forbore borrowers who exited COVID-19 forbearance in June 2020, and so on.

Source: FRB Y-14 data with observation months from February 2020 to December 2020

The nonpaying behavior for borrowers under forbearance could be due to the borrowers' inability to pay due to the unemployment shock; it could also be due to borrowers' strategic choices to not pay in order to accumulate liquidity for future potential income or unemployment shocks. Panel B of exhibit 5 plots the nonpayment rate per month following borrowers who exited in different months. For example, for borrowers who exited forbearance in July 2020, the nonpaying rate was consistently high until June 2020 before it dropped in July, when the borrowers exited the forbearance, and it remained low afterwards. This pattern persists for exits in different exit months (the earlier exits overall had a lower noncurrent rate post-exits). It appears that once borrowers exit the forbearance, their payment behavior distinctly changes. In the sections below the focus is therefore on borrower forbearance exits and their performance post-exit.

Exiting Forbearance

Summary Statistics

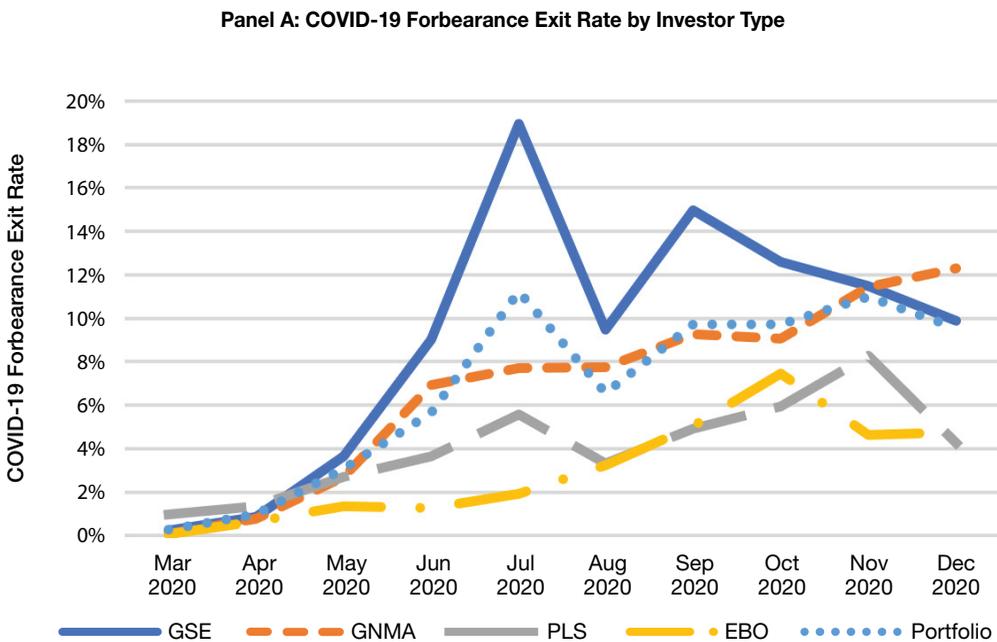
A glimpse of the forbearance exits can be caught from Panel B of exhibit 1, which plots the number of loan remaining under forbearance by entry month. For example, 1.2 million loans entered forbearance in April, and by the last reporting month, 0.5 million remained for these April

entrants, i.e., 0.7 million of the April entrants exited by December 2020. The pattern is similar for loans entering forbearance in later months.¹⁹

Panel A of exhibit 6 offers an explicit examination of forbearance exit rates over time and by investor type. The y-axis is the percent of the current number of borrowers under forbearance that exits in the month. GSE loans had the highest exit rate, particularly in July 2020, likely reflecting the 3-month mark for the April entrants. Portfolio loans also had a relatively high exit rate in July 2020. The second highest exit rate for GSE loans was in September 2020, after which the exit rate declined. Portfolio loans, while having overall lower exit rates than GSE loans, had more stable exit rates since July 2020. GNMA loans had similar levels of exit rates than portfolio loans, but this was because of the early buyouts by servicers. EBO loans had consistently low forbearance exit rates, similar to the level for loans in private label securities.

Exhibit 6

Forbearance Exit by Unemployment Rate and Borrower FICO (1 of 3)

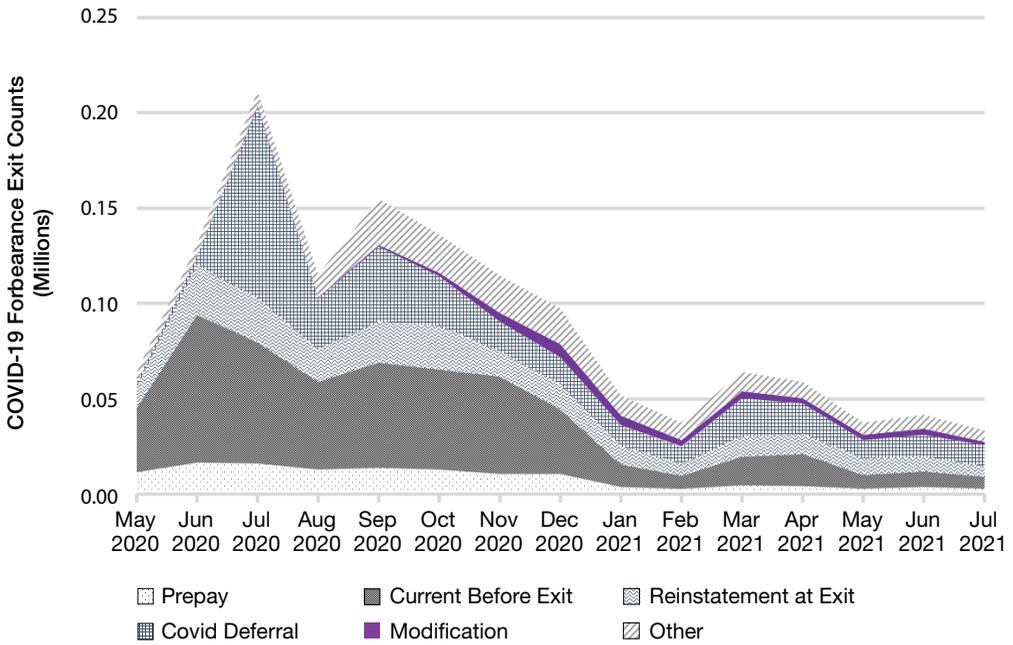


¹⁹ Timing of exits was partially due to servicers’ designs of forbearance programs; servicer fixed effects were thus included in the regression analyses. Analyses were conducted by investor type as applicable.

Exhibit 6

Forbearance Exit by Unemployment Rate and Borrower FICO (2 of 3)

Panel B: COVID-19 Forbearance Exit Counts by Exit Type



Panel C: COVID-19 Forbearance Exit Rate by Borrower FICO

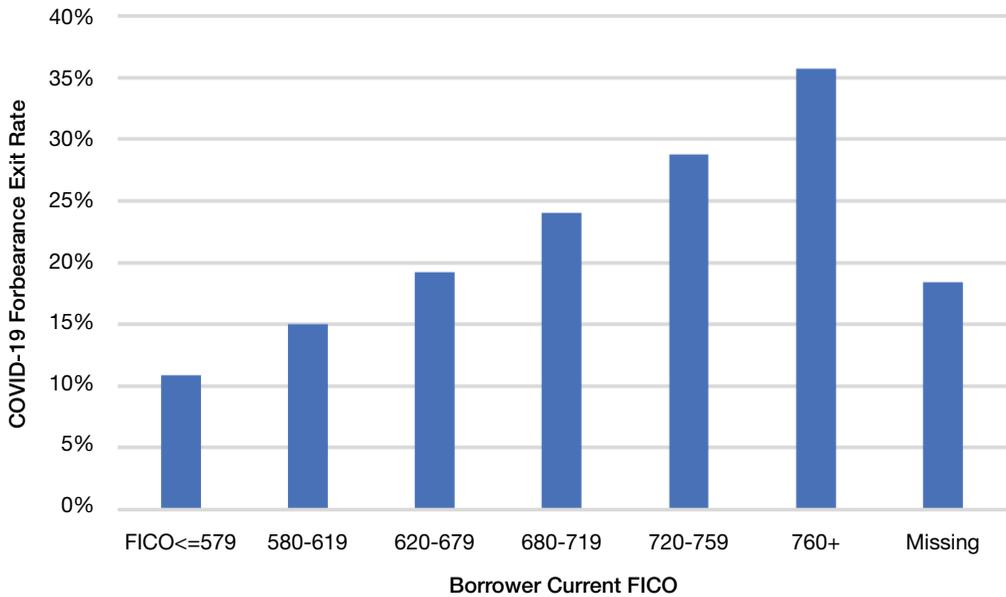
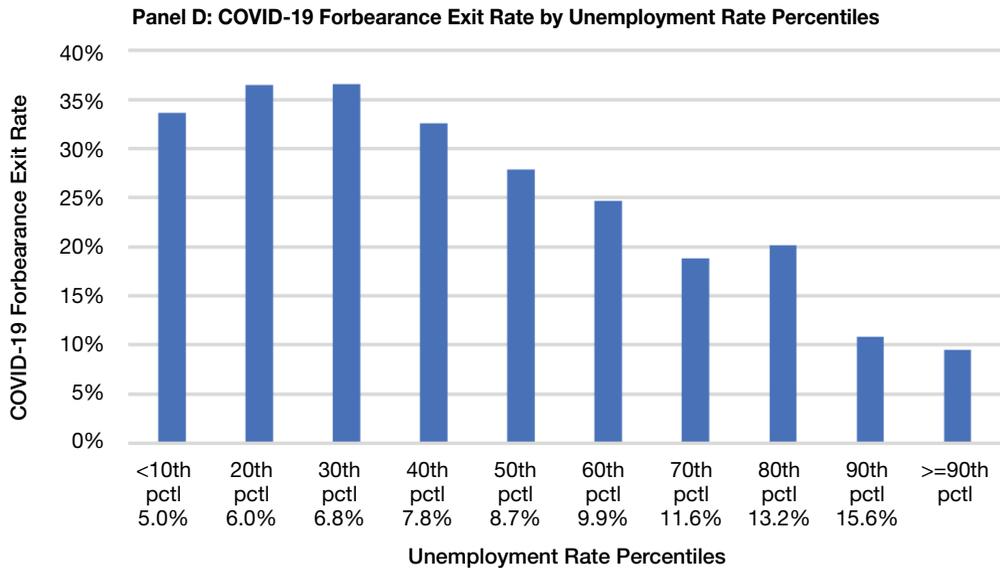


Exhibit 6

Forbearance Exit by Unemployment Rate and Borrower FICO (3 of 3)



EBO = early buyout. FICO = Fair, Isaac and Company credit score. GNMA = Ginnie Mae. GSE = Government sponsored entities. PLS = private-label securitizations. Notes: EBO are loans bought out of GNMA securities pools. CurrentBeforeExit refers to loans under forbearance that borrowers continued to make payments. ReinstatementAtExit refers to borrowers who did not make all payments but brought the loan to current at exit (called “reinstatement”). CovidDeferral refers to exits where the forbore monthly payments were deferred to loan maturity, refinance, or sale of the property. Modification refers to exits where the borrower exits via a rate or term or a combination modification where monthly payment is reduced after the modification. Other includes less frequent forms including those who exited in delinquent status.

Source: FRB Y-14 data with observation months from Feb. to Dec. 2020, except for February 2020–July 2021 in panel B.

Forms of Forbearance Exits

Borrowers exit forbearance in different forms. First, some forbore borrowers are able to get refinancing (and naturally exit forbearance). Of the 1.0 million borrowers who exited forbearance as of December 2020, 0.11 million, or 11 percent, prepaid at exit.

Exiting for borrowers who have been paying all along under forbearance is straightforward—the principal amortizes as scheduled, and the monthly payment amounts remain intact upon exits. Roughly 0.42 million borrower exits are of this category.

For borrowers who did not make all monthly payments under forbearance, of which there were 0.46 million, they could pay off the accumulated missed monthly payments, bring the loan back to the original amortization schedule in the month of forbearance exits, and resume their regular payment after exits. Approximately 0.15 million borrowers are of this category, also called “reinstatement.”

However, such one-time forbore monthly payments at exit are not required for exiting forbearance; a popular form, termed COVID-19 deferral, is to resume prior (to forbearance) monthly payments upon exiting, with the accumulated missed monthly payments due upon

maturity, refinance, or property sale.²⁰ This form does not involve changes in rates or loan terms (and thus monthly payments after forbearance exits remain intact). Approximately 0.23 million borrowers exited in this fashion.

Lastly, a borrower, often unable to exit and resume the original monthly payments, might exit with a modification in terms or rates, or most often in combination, that results in a lower monthly payment. Slightly above 1 percent of all exits were with rate or term modifications from March to December 2020.²¹

Panel B of exhibit 6 plots the number of forbearance exits by exit type using data as of July 2021. Notable is that the exits in earlier months (April–June 2020) were mostly those who were paying under forbearance. In July 2020, exits due to the COVID-19 deferral became the dominant type; within it were mainly GSE loans. Exits via modification appeared late in the sample. The “other” category encompasses exits without these forms of assistance.

Bivariate Analyses

What determines forbearance exits? Bivariate analyses were first conducted and then regression analyses. Panel C of exhibit 6 shows that forbearance exit rates increase with borrower FICO scores; borrowers with FICO scores greater than 760 had exit rates that were close to 3.5 times that of borrowers with FICO scores lower than 580. Shown from a different angle, borrowers who exited earlier had higher FICO scores. For example, the July exits had a median FICO score of 753, and the December exits had a median of 716.

Panel D of exhibit 6 plots the forbearance exit rates by unemployment rate percentile: borrowers in lower unemployment rate counties have higher exit rates. Moving from the 10th to the 90th percentile, borrowers’ exit rates decreased by close to two-thirds.

The relationship between the exit rate and borrower credit scores was examined by exit type. The relationship is very close for the exit types of COVID-19 deferral and reinstatement. Prepayment also increased with credit scores, but the relationship was not as strong. Exit by modification does not appear to vary much with credit score. The category Other appears to have a weakly positive relation between exits and credit scores.

In addition, the relationship between the exit rate and unemployment rate was investigated by exit type. Again, the relationship is close for the exit by COVID-19 deferral and reinstatement. Below, in regression analyses, total exits are examined first and individual types of exit are then investigated when applicable.

²⁰ These deferred payments can be spread across the number of months of missed payments at the end of the original term. For example, suppose the borrower stays in forbearance for 12 months and did not make a single payment. Suppose the monthly pay is \$2,000 and the loan is currently year 10 of a 30-year term. The forborne borrower will be expected to pay the \$2,000 over the course of 12 months when the term ends. Approximately 20,000 borrowers had explicit extensions of this sort.

²¹ Approximately 20,000 borrowers who entered forbearance received modifications as of December 2020; some of these modified loans remained under forbearance.

Regression Analyses of Forbearance Exits

Exhibit 7 shows the regression analyses of forbearance exits. Beyond the explanatory variables used in forbearance entry, an important variable was added: number of months under forbearance. Forbearance termination can be voluntary or caused by expiration of the forbearance plan; including such variables helps capture the impact of forbearance plans.

Exhibit 7

Regressions on Forbearance Exits (1 of 2)									
Panel A: Full Sample—All Investors									
Dep. Var.: Forbearance exit by non-prepay									
		(1)		(2)		(3)			
Variable	Class Value	Estimate	StdErr	Estimate	StdErr	Estimate	StdErr	Estimate	StdErr
Intercept		− 1.62	3.24	− 1.89	5.34	− 1.81	5.34		
FICO Current (lag)	580–619	− 0.12***	0.01	− 0.13***	0.04	− 0.15***	0.01		
(omitted group: <580)	620–679	0.03***	0.01	0.09***	0.03	0.00	0.01		
	680–719	0.17***	0.01	0.16***	0.02	0.14***	0.01		
	720–759	0.28***	0.01	0.20***	0.02	0.24***	0.01		
	760+	0.44***	0.01	0.33***	0.02	0.40***	0.01		
	Missing	− 0.49***	0.02	− 0.34***	0.05	− 0.32***	0.02		
Unemployment Rate (or UR)		− 0.09***	0.00	− 0.03***	0.00	− 0.04***	0.00		
UR*FICO_Curr in	580–619			0.00	0.00				
	620–679			− 0.01***	0.00				
	680–719			0.00	0.00				
	720–759			0.00*	0.00				
	760+			0.01***	0.00				
	Missing			0.00	0.01				
pct_HH_inc>75k						− 0.16**	0.07		
UR*pct_HH_inc>75						0.01	0.01		
Borrower/loan controls			Yes		Yes		Yes		
AUC			0.73		0.76		0.76		
Observations					1.53M				
Panel B: Sub-Sample Analyses, by Investors									
Dep. Var.: Exit by non-prepay									
		GSE		FHA/VA		Portfolio		PLS	
Variable	Class	Estimate	StdErr	Estimate	StdErr	Estimate	StdErr	Estimate	StdErr
Intercept		− 3.38*	1.80	− 4.11	10.70	− 3.34	25.43	− 1.81	1,094.66
FICO_Current (lag)	580–619	− 0.09*	0.06	− 0.27***	0.06	− 0.06	0.10	− 0.26*	0.14
(omitted grp: <580)	620–679	0.00	0.04	0.12**	0.04	0.17**	0.07	0.20*	0.11
	680–719	0.13***	0.03	0.26***	0.05	0.21***	0.07	− 0.02	0.13
	720–759	0.19***	0.03	0.34***	0.05	0.22***	0.07	0.06	0.13
	760+	0.34***	0.03	0.55***	0.04	0.35***	0.05	0.36***	0.12
	Missing	− 0.50***	0.09	− 0.41***	0.08	− 0.55***	0.13	0.15	0.23
Unemployment Rate (UR)		− 0.05***	0.00	− 0.04***	0.00	− 0.04***	0.00	− 0.07***	0.01

Exhibit 7

Regressions on Forbearance Exits (2 of 2)

Panel B: Sub-Sample Analyses, by Investors

Dep. Var.: Exit by non-prepay		GSE		FHA/VA		Portfolio		PLS	
Variable	Class	Estimate	StdErr	Estimate	StdErr	Estimate	StdErr	Estimate	StdErr
UR*FICO_Curr	580–619	0.00	0.01	0.00	0.01	-0.01	0.01	0.03**	0.01
	620–679	0.00	0.00	-0.01	0.00	-0.02**	0.01	-0.02*	0.01
	680–719	0.00	0.00	0.00	0.01	-0.02**	0.01	0.01	0.01
	720–759	0.01*	0.00	0.00	0.01	0.00	0.01	0.01	0.01
	760+	0.01***	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Servicer/State fixed effects		Yes		Yes		Yes		Yes	
AUC		0.72		0.77		0.77		0.72	
Observations		508,617		310,516		155,155		62,453	

AUC = Area under the ROC curve. GSE = government sponsored entities. FE = fixed effects. FHA = Federal Housing Administration. VA = Veterans Administration. PLS = private-label securitizations.

Note: Borrower/loan attributes are included.

Source: 10 percent sample of FRBY-14, Feb 2020–Dec 2020

Column 1 of Panel A shows results from a specification where the dependent variable equals 1 if the exit is non-prepay, which comprises reinstatement, deferral, modification, or others. It uses a specification where the lagged payment behavior is fully specified—30+DPD, 60+DPD, etc.²² Column 2 has the same specification as column 1, except that it includes the interaction between unemployment rate and FICO bins, and column 3 instead includes the interaction with percent of higher income in a ZIP Code. Appendix exhibit A2 presents results using alternative specifications. Specifically, results in appendix exhibit A2 are from a multinomial logit specification where prepayment and non-prepayment exits are treated as competing events.

Shown across columns in Panel A of exhibit 7 (and column 1 in appendix exhibit A2), forbearance exits in the form of non-prepayment increase with borrower credit scores and decrease with past non-payment behavior under forbearance. The exit rate is highest when the borrower has been under forbearance for 6 months, reflecting the CARES Act’s mandatory initial forbearance period of 6 months.

The coefficient on unemployment rate in non-prepayment exit is consistently negative at around -0.03. A 10-percentage point increase in unemployment rate would be associated with a decrease in exit log-odds of 0.3, a magnitude similar to the effect of having a credit score below 580 versus above 760.

Column 2 in Panel A further shows that the response of forbearance exit on unemployment is strongest for borrowers with credit scores of 620–679 and smallest for those with scores above 760. It suggests that borrowers with lower credit scores depend on improvement in the labor market in exiting forbearance more than their higher-score counterparts.²³

²² Not all estimated coefficients are shown in the exhibits for brevity reason.

²³ Shown in Column 3, the effect of unemployment on forbearance exit is smaller for borrowers in higher-income ZIP Codes; however, the coefficient is statistically insignificant.

Column 2 in appendix exhibit A2 examines the exit in the form of prepayment (in multinomial logit).²⁴ The effect of credit scores appears different for prepayment exit versus non-prepayment exit; relative to borrowers with lower credit scores, borrowers with credit scores of 720–759 and 680–719 are relatively more likely to exit via prepayment than they do via non-prepayment exits. Prepayment is examined in more depth later in this report.

Panel B of exhibit 7 presents results from sub-sample analyses of forbearance exits. The reported specification has the interaction between unemployment rates and borrower credit scores. The nonprepayment exits for GSE loans, FHA/VA loans, portfolio loans, and PLS loans were examined, respectively. The four columns show that borrowers with greater credit scores have a higher likelihood of exiting forbearance. Also confirmed is the finding that greater unemployment reduces the exit likelihood across the sub-samples. The smaller impact of the unemployment rate on exit for borrowers with greater credit scores comes from the GSE sub-sample.²⁵

The Performance After Forbearance Exits

Summary Statistics

One prominent feature of COVID-19 forbearance is that borrowers who exited can re-enter forbearance. Panel A of exhibit 8 plots the number of borrowers who missed three payments among those who ever entered forbearance. Not surprisingly, the largest chunk of this group were those who were still in forbearance. A small portion of these borrowers were those who re-entered, reflecting that those who found difficulty in paying after exits can request to re-enter.²⁶ Less than 20,000 forbearance exits and non-re-entrants were in serious delinquency as of December 2020.

²⁴ A series of further robustness checks were conducted. First, results are robust to clustering standard errors at the servicer-reporting month level. Second, an alternative way of forming the forbearance exit analysis sample—dropping observations after a loan exits the forbearance—was examined; results are robust to this treatment.

²⁵ For brevity, servicer fixed effects are not reported. Similar to results for COVID-19 forbearance entry analyses, the servicer fixed effects in COVID-19 forbearance exits are statistically insignificant for GSE and FHA/VA loans but are significant for portfolio loans.

²⁶ Of the approximately 1 million exits, around 20,000 re-entered.

Exhibit 8

Performance of COVID-19 Forbearance Exits vs Never-forborne Borrowers (1 of 2)

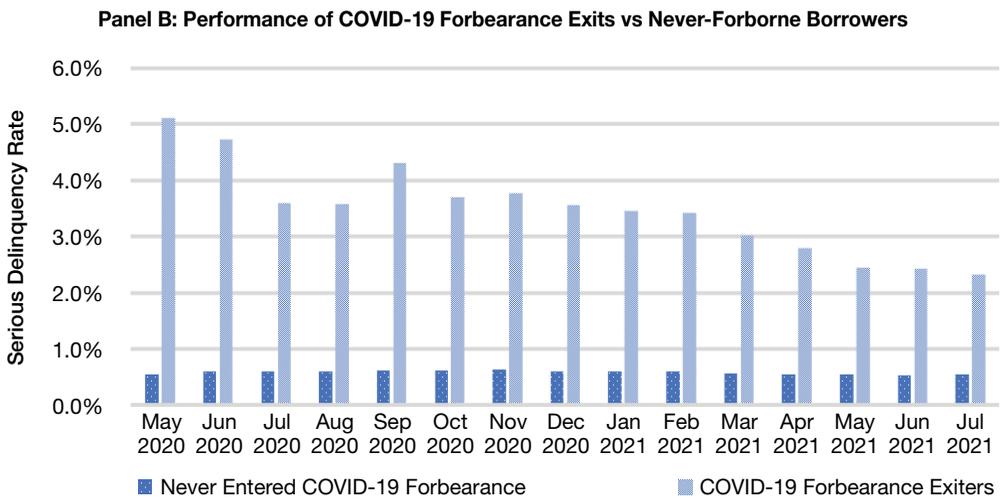
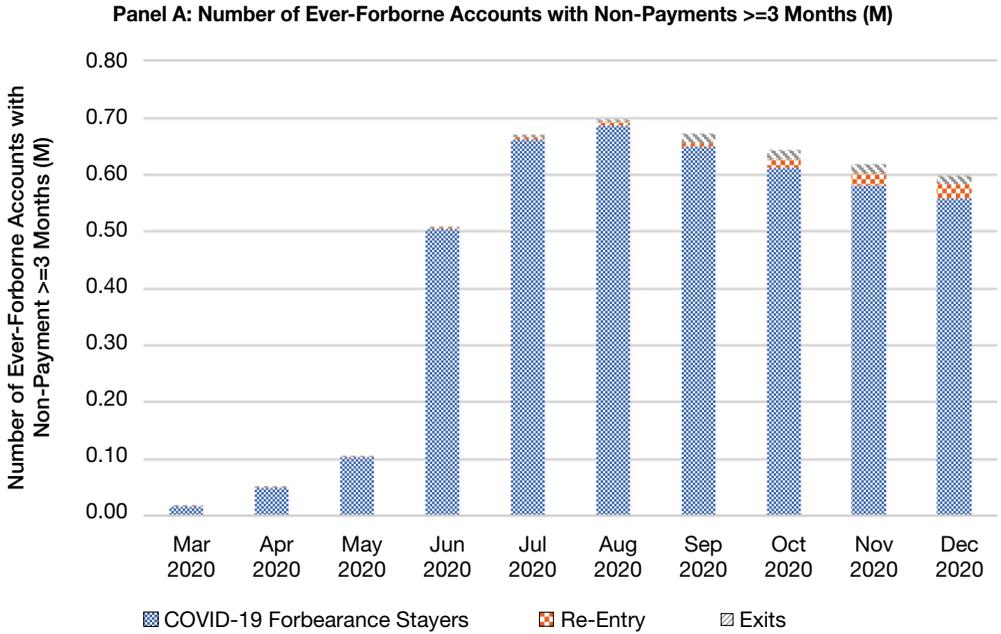
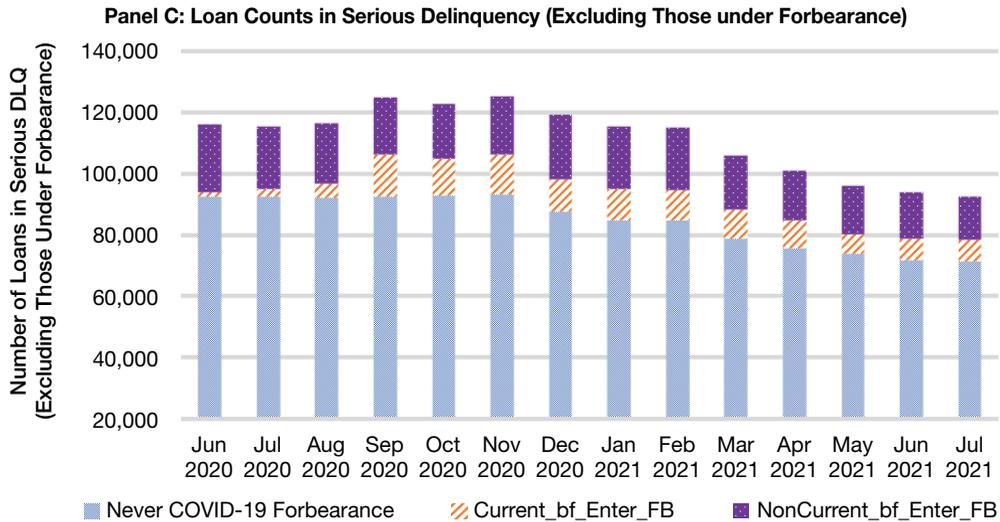


Exhibit 8

Performance of COVID-19 Forbearance Exits vs Never-Forborne Borrowers (2 of 2)



Notes: Re-entry refers to those who have once exited forbearance but re-entered. Serious delinquency is DPD90+ or in foreclosure/REO. NonCurrent_bf_Enter_FB: COVID-19 forbearance exits who were not current before entering forbearance, and so forth.

Source: FRB Y-14 data with observation months from February 2020–July 2021, except for February 2020–December 2020 in Panel A

Regression Analyses

Panel A of exhibit 9 provides results from regression analyses of loan-month observations after a forbore loan exits using performance data as of December 2020. Column 1 shows results where the dependent variable is an indicator variable for re-entry to forbearance, column 2 has an indicator variable for prepayment as the dependent variable, and column 3 has an indicator variable for serious delinquency as the dependent variable. The specification is the same as that in the equation for forbearance entry analyses, except for the dependent variable.

Exhibit 9

Performance Analyses (1 of 2)

Panel A: Loan Performance After COVID-19 Forbearance Exits

Dep. Var.:		(1) Re-enter Forbearance		(2) PrePay		(3) Serious Delinquency	
Variable	ClassValue	Estimate	StdErr	Estimate	StdErr	Estimate	StdErr
Intercept		-2.81	6.16	-15.97	37.40	-4.88	39.80
FICO_Current (lag)	580–619	0.33***	0.03	-0.45***	0.12	0.40***	0.03
(omitted grp:<580)	620–679	0.06***	0.02	0.14*	0.08	-0.15***	0.03
	680–719	-0.15***	0.02	0.36***	0.07	-0.50***	0.03
	720–759	-0.43***	0.02	0.66***	0.07	-0.80***	0.03
	760+	-0.67***	0.02	0.51***	0.05	-1.09***	0.02
	Missing	0.22***	0.05	-0.42***	0.14	1.03***	0.05

Exhibit 9

Performance Analyses (2 of 2)

Panel A: Loan Performance After COVID-19 Forbearance Exits

Dep. Var.: Variable	Class	(1) Re-enter Forbearance		(2) PrePay		(3) Serious Delinquency	
		Estimate	StdErr	Estimate	StdErr	Estimate	StdErr
Unemployment Rate		0.001	0.003	- 0.003	0.01	- 0.04***	0.00
Servicer & State FE			Yes		Yes		Yes
AUC			0.78		1.00		0.87
Observations		302,255					

Panel B: Performance of Never-Forborne Borrowers vs COVID-19 Forbearance Exits

Dep. Var: Serious Delinquency	Class Value	All Investors		All Investors		GSE		FHA/VA		Portfolio	
		Estimate	StdErr	Estimate	StdErr	Estimate	StdErr	Estimate	StdErr	Estimate	StdErr
Intercept		- 0.46***	0.15	- 1.02***	0.15	- 8.53	28.22	0.18	24.16	- 7.63	10.07
Ever_In_ Forbearance		1.83***	0.01	1.48***	0.02	2.12***	0.03	1.23***	0.02	1.57***	0.04
Dlq_Before_Enter_FB				0.79***	0.02	1.00***	0.03	0.70***	0.03	0.76***	0.05
FICO_ Current (lag)	<=579	1.75***	0.01	1.68***	0.01	1.63***	0.02	1.73***	0.02	1.59***	0.03
Omitted:	580-619	0.85***	0.01	0.83***	0.01	0.83***	0.03	0.77***	0.02	0.86***	0.04
	720-759										
	620-679	0.03*	0.01	0.05***	0.01	0.00	0.03	- 0.04*	0.02	0.18***	0.03
	680-719	- 0.74***	0.02	- 0.69***	0.02	- 0.68***	0.03	- 0.80***	0.03	- 0.57***	0.04
	760+	- 2.21***	0.02	- 2.20***	0.02	- 2.10***	0.03	- 2.05***	0.04	- 2.08***	0.04
	Missing	1.57***	0.02	1.55***	0.02	1.43***	0.03	1.72***	0.03	1.10***	0.04
Unemployment Rate		0.19***	0.00	0.18***	0.00	0.15***	0.00	0.19***	0.00	0.19***	0.00
AUC		0.92		0.92		0.877		0.93		0.95	
Observations		20.60M		20.60M		13.50M		3.02M		3.26M	

AUC = Area under ROC curve. GSE = government sponsored entities. FE = fixed effects. FHA = Federal Housing Administration. VA = Veterans Administration. PLS = private-label securitizations.

Notes: Re-enter takes the value of 1 if the borrower re-enters COVID-19 forbearance after he/she exits. Serious delinquency is DPD90+ or in foreclosure/REO. Borrower/loan attributes are included.

Source: 10 percent sample of FRB Y-14 data, February 2020–December 2020 for Panel A and February 2020–July 2021 for Panel B

Panel A of exhibit 9 shows that borrowers with higher credit scores are less likely to re-enter forbearance, have a lower serious delinquency rate, and are more likely to prepay. The estimated coefficients indicate that the impact of higher credit scores is larger in reducing serious delinquency rates than in reducing re-entries and that borrowers with credit scores of 720–759 are particularly prone to prepay (more than those with higher than 760).²⁷

Shown in Panel A of exhibit 9, the unemployment rate has a statistically insignificant effect on either re-entry or prepay. The coefficient for the unemployment variable in the serious delinquency

²⁷ The area under ROC (or AUC) for the prepay regression is very high, which arises because the prepayment almost exclusively went to borrowers who had the lowest refreshed loan-to-value ratios (after they exit forbearance).

regression, on the surface, is counter-intuitive, at a negative value. However, this could be caused by borrowers, facing higher unemployment, resorting to forbearance re-entry as a means to manage payments, creating an unusual relationship. The result could also be partially due to the short performance history after borrower exits because the performance data used here are as of December 2020. In next subsection, performance data as of July 2021 were used to further examine performance of borrowers who exited COVID-19 forbearance and compared them with those who never entered.

Comparing Performance of Never Forborne Borrowers versus Forbearance Exits

Loan performance of borrowers who exited forbearance were compared with that of borrowers who never entered forbearance in this subsection.²⁸ Panel B of exhibit 8 shows that the serious delinquency rate for never-forborne borrowers, in each report month, is at a level lower than 1 percent, whereas the rate for the forbearance exits were around 3 percent (and declining over time). It is worth noting that the number of borrowers who never entered forbearance is the majority.

As a result, excluding those still under forbearance, the number of borrowers in serious delinquency was still mainly from borrowers who had never entered forbearance. In Panel C of exhibit 8, borrower forbearance exits are separated by whether borrowers are delinquent prior to forbearance entrance, and the finding is that those who were already behind in payments prior to forbearance entry persisted in their serious delinquency post-forbearance exits, even as the economy started recovery in 2021.

Panel B of exhibit 9 reports regression results on loan performance using data as of July 2021. The sample of analyses excludes loan-month observations when a borrower is under forbearance; the focus was to compare repayment behavior of those who exited the forbearance with those who never entered. The total number of observation for this analysis is 20.6 million, reflecting the 10 percent random sample of report months from February 2020 to July 2021.

The dependent variable is entering serious delinquency, i.e., it takes the value of 1 when a loan becomes 90 days or more past due or in foreclosure or REO status; the observations after the loan became seriously delinquent were dropped. The explanatory variable of interest is Ever_In_Forbearance, which takes the value of 1 if the loan has ever entered COVID-19 forbearance (and has now exited) and 0 otherwise. The variable Dlq_Before_Enter_FB takes the value of 1 if the borrower is noncurrent prior to entering COVID-19 forbearance and 0 otherwise. A comprehensive list of borrower and loan attributes are included, as in Equation (1); the coefficient on Ever_In_Forbearance thus captures the additional (possibly hard-to-measure) risk factors that are not reflected in the loan and borrower characteristics included in the regressions.

Columns 1 and 2 include all investors, whereas the next three columns focus on GSE loans, FHA/VA loans, and portfolio loans, respectively. Column 1 includes Ever_in_Forbearance alone, and Column 2 includes both variables of interest. The estimated coefficient on Ever_In_Forbearance

²⁸ Kim et al. (2021) examines the potential information friction in servicers' provision of debt payment reliefs in the COVID-19 pandemic.

was 1.83, at a magnitude very close to that of the borrower having a current FICO score lower than 580 (relative to those with scores ranging from 720 to 759).

In addition, column 2 shows that the coefficient on *Ever_In_Forbearance* remains positive, and the coefficient on *Dlq_Before_Enter_FB* is significant positive and with a magnitude of close to that of the borrower having a current FICO score of 580–619 (relative to 720–759). This pattern of findings persists in the sub-sample results by investors. This evidence indicates that borrowers that ever utilized COVID-19 forbearance had higher serious delinquency risk than those who never entered beyond what is captured by typical borrower and loan characteristics.

With the CARES Act provision that credit scores should be not affected by the borrower entering a COVID-19 forbearance program, debates exist on whether credit scores still perform in differentiating borrower default risk as expected. Comparing the results in column (3) of Panel A and results in the first two columns of Panel B indicate that the log-odds of entering serious delinquency by borrowers with current a FICO score (lagged by 1 month) greater than 760 who have exited COVID-19 forbearance are 1.09 lower than those with scores lower than 580, whereas the log-odds of borrowers with current FICO scores greater than 760 in the overall sample were 2.21 lower than those with scores lower than 580, suggesting that current FICO scores have a greater effect on serious delinquency in the general population than in borrowers who experienced and exited COVID-19 forbearance.

The AUC, representing area under the ROC curve, is a measure of the model's discrimination power. It is at 0.87 in column (3) of Panel A, which is lower than that in the first two columns in Panel B, at 0.92. These results hint that while credit score (specifically FICO) is still a strong predictor for loan performance, its ability may have slipped, shown in data from the COVID-19 period. However, drawing a firm conclusion on this trend and assessing the precise magnitude of the drop will require more systematic studies and data with longer performance history, which is outside the scope of this paper.

Unintended Consequence of Forbearance: Reductions in Refinance?

The above analyses highlight the benefits of the forbearance programs: borrowers flocked into the programs in response to a sharp rise in unemployment rate, borrowers with higher credit scores exited it earlier, borrowers in general exited forbearance as the unemployment rate declined, and borrowers who exited the forbearance, despite having serious delinquency rates higher than those who never utilized forbearance, mostly paid (likely with the assistance from deferral programs). In this section, it is examined whether there was a potential unintended consequence of the wide-spread forbearance programs for federally guaranteed or insured mortgages and non-public mortgages as well: by giving a borrower insurance against decline in credit score while not paying under forbearance, as mandated in CARES Act, the program might inadvertently have reduced the borrowers' abilities and opportunities to refinance and thus build greater wealth.²⁹

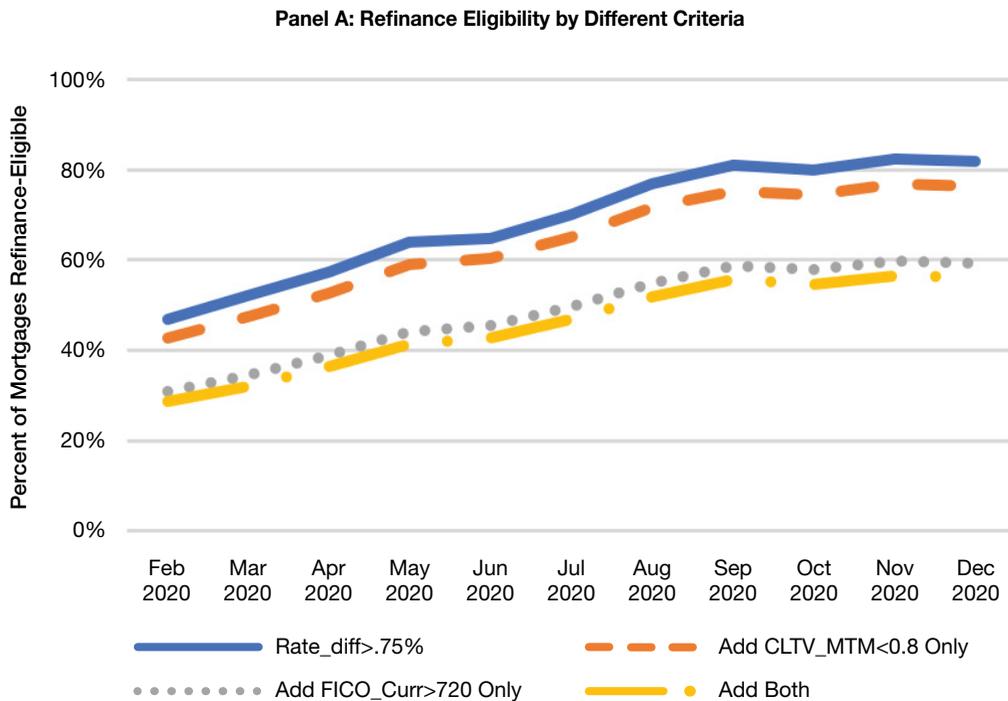
²⁹ Farrell, Bhagat, Zhao (2019) and Ganong and Noel (2018) examine the role of borrower liquidity and equity in consumer loan defaults.

Summary Statistics

Exhibit 10 examines, whether under COVID-19 forbearance or not, the percent of loans that qualify for a refinance, defined first as the rate difference greater than 75 bps, and then further requiring combined mark-to-market loan-to-value ratio (CLTV_MTM) lower than 0.8 and borrower current FICO scores greater than 720.³⁰ Panel A shows that FICO, instead of CLTV, restricts the refinance eligibility to a larger degree.

Exhibit 10

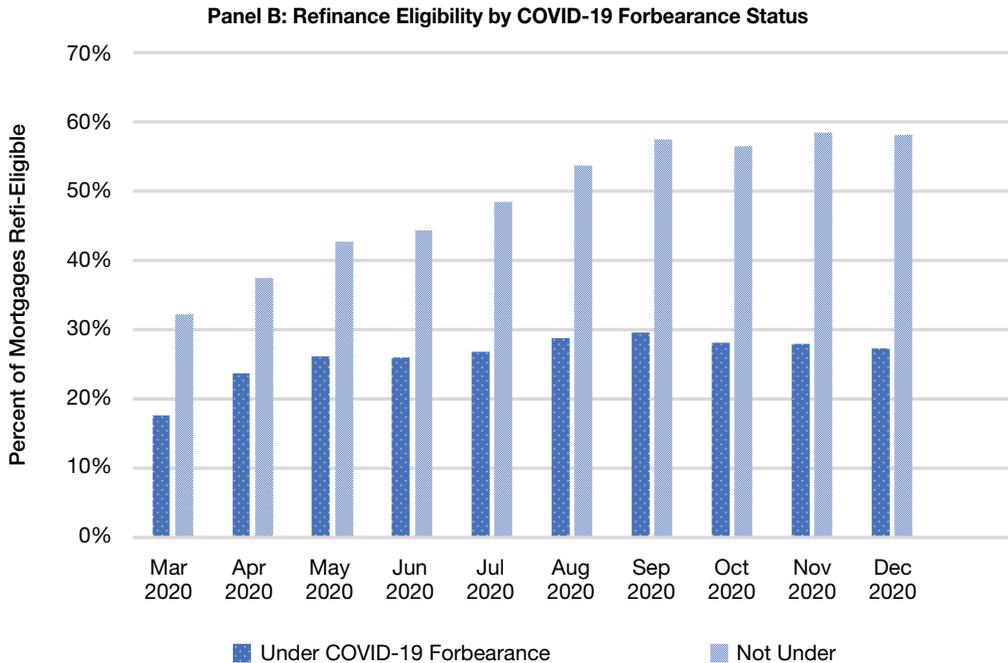
Refinance Eligibility and COVID-19 Forbearance (1 of 2)



³⁰The mark-to-market or refreshed property value in Y-14 is the original property value adjusted with the ZIP Code level housing price index changes from the closing month to the reporting month; the HPI was sourced from Loan Processing Services Applied Analytics. The nominator was formed by combining the outstanding principal balance of the first-lien mortgage and the balance of the second-lien mortgage. Lacking details on the amortization of the second lien loan led to the use of the origination amount of the second lien loan; the calculated CLTV is thus an upper bound of the true value.

Exhibit 10

Refinance Eligibility and COVID-19 Forbearance (2 of 2)



Notes: Refinance eligibility is defined first as rate difference greater than 75 bps, and then further requiring loan-to-value ratio lower than 0.8, or borrower FICO scores greater than 720, or both.

Source: FRB Y-14 with observation months from February 2020 to December 2020

Panel B shows that 1) a greater percentage of borrowers not under forbearance were eligible for refinance than those under forbearance, and 2) close to 30 percent of borrowers under forbearance were eligible for refinance, using the most restrictive eligibility definition. However, the lower rate for those under forbearance could be due to lower credit scores. In the regression analyses below, such factors were thus controlled for; how forbearance, especially nonpayment under forbearance, affected refinance likelihood is examined below.

Regression Analyses

Using Forbearance and Payment Status, Lagged by 1 Month

The aim of the examination is whether borrowers' prepayment likelihood varies with the borrower under forbearance and whether he/she pays while under forbearance. The sample for this analysis is thus the full sample. The final number of loan-month observations used in the regression is 16.9 million. The basic econometric specification includes these variables—under forbearance and their payment behavior while under forbearance—besides the basic borrower/loan characteristics variables.

Exhibit 11 shows the regression results; the dependent variable is 1 if the borrower prepays. The first 3 columns used the status of the borrower's forbearance and payment status lagged by 1 month. Column 1 uses all observations, whereas columns 2 and 3 use the sub-sample of federally backed and privately owned mortgages, respectively. The former included those with investors being GSE or GNMA or the loan type being FHA or VA; the latter are the remainder.

Exhibit 11

Impact of Forbearance (and Payment) on Prepay											
	(1)		(2)		(3)		(4)		(5)		
	Lag 1 month		Lag 1 month		Lag 1 month		Lag 3 months		Lag 3 months		
Dep. Var.: Prepay	All		Federally Backed		Private		Federally Backed		Private		
Intercept	-4.58***	0.17	-5.39	4.01	-4.71***	0.20	-5.65	5.16	-4.94***	0.20	
FICO Current	-0.49***	0.01	-0.52***	0.02	-0.41***	0.03	-0.55***	0.02	-0.38***	0.03	
580–619											
620–679	-0.09***	0.01	-0.09***	0.01	-0.10***	0.02	-0.14***	0.01	-0.13***	0.02	
680–719	0.24***	0.01	0.26***	0.01	0.17***	0.02	0.21***	0.01	0.11***	0.02	
720–759	0.42***	0.01	0.44***	0.01	0.35***	0.01	0.40***	0.01	0.31***	0.01	
760+	0.57***	0.01	0.60***	0.01	0.52***	0.01	0.56***	0.01	0.47***	0.01	
Missing	0.05***	0.01	0.03**	0.02	0.10***	0.03	0.20***	0.02	0.18***	0.03	
Under_FB (lag)	-0.85***	0.02	-0.92***	0.02	-0.66***	0.04	-0.25***	0.03	-0.08	0.05	
Current (lag)	-0.25***	0.02	0.58***	0.03	0.24***	0.05	0.14***	0.03	-0.19***	0.06	
FB (lag)*Current (lag)	0.49***	0.02	-0.31***	0.02	-0.11***	0.03	0.30***	0.03	0.41***	0.04	
Unemployment rate	-0.02***	0.00	-0.02***	0.00	-0.02***	0.00	-0.04***	0.00	-0.03***	0.00	
Borrower/Loan controls	Yes		Yes		Yes		Yes		Yes		
State/Svcr fixed effects	Yes		Yes		Yes		Yes		Yes		
AUC	0.65		0.64		0.67		0.65		0.67		
Observations	16.9M		13.6M		3.3M		10.6M		2.6M		

AUC = Area under the ROC curve. FB = COVID-19 forbearance. FHA = Federal Housing Administration. VA = Veterans Administration. *** = Statistically significant at the 1-percent level.

Notes: Columns 1–3 use the borrower's COVID-19 forbearance (FB) status and payment status, lagged by 1 month. Columns 4–5 use the borrower's forbearance and payment status, lagged by 3 months.

Source: 10 percent sample of FRB Y-14 data, February–December 2020

Across the columns, borrowers with greater credit scores have a higher likelihood of being prepaid via refinance. On the impact of forbearance status as of last month, it reduces the log-odds of prepayment by 0.85, greater than the impact of the borrower having a credit score of 760+ (relative to those with scores of 579 or less). However, making the payment while under the forbearance greatly alleviated the adverse impact of forbearance on prepay: the log-odds increases by 0.49.

Looking across the private versus the public backed mortgages, such patterns persist with the magnitude smaller for private mortgages.³¹

Possibly anticipating this effect, agencies such as GSEs promulgated policies that greenlighted refinancing for borrowers under forbearance who still pay and borrowers who exit the forbearance and make three consecutive payments (FHFA, 2020). The below analyses use the forbearance and payment status, lagged by 3 months.

Using Forbearance Status, Lagged by 3 Months

Columns 4 and 5 of exhibit 11 show the results, with column 4 examining the federally backed loans and column 5 looking at privately owned loans. Comparing the coefficient on Under_FB (lag) in column 4 with that in column 1 shows that federally backed loans, being in forbearance 3 months prior, have a much weaker negative impact on prepayment likelihood than from being in forbearance 1 month ago. The results for privately owned loans using a 3-month lag in forbearance and payment status are distinct from those using a 1-month lag as well. These results suggest that a distant nonpayment under forbearance has a distinctly less negative impact on refinance probability as an immediate one, particularly for federally backed ones where programs exist to foster refinance accessibility after a borrower's forbearance experience.

Summarizing these results yields the findings that, 1) being in forbearance reduces borrowers' prepayment likelihood, 2) paying under forbearance mitigates the adverse effect of forbearance on borrower prepayment likelihood, and 3) the adverse effect of forbearance on prepayment is diminished when payments are made consecutively, likely reflecting the agency policy that qualifies such a borrower for refinance.

Servicers' Use of Early Buyouts

The majority of this report examines payment relief provided by COVID-19 forbearance to mortgage borrowers. However, servicers are still obligated to remit payments to investors.³² This section investigates how bank servicers manage the costs associated with servicing borrowers in forbearance. FHA/VA loans have the highest noncurrent rate. For example, across May–September 2020, the noncurrent rate of FHA/VA loans were consistently at 18 percent, and the majority of these nonpaying loans were those under forbearance.

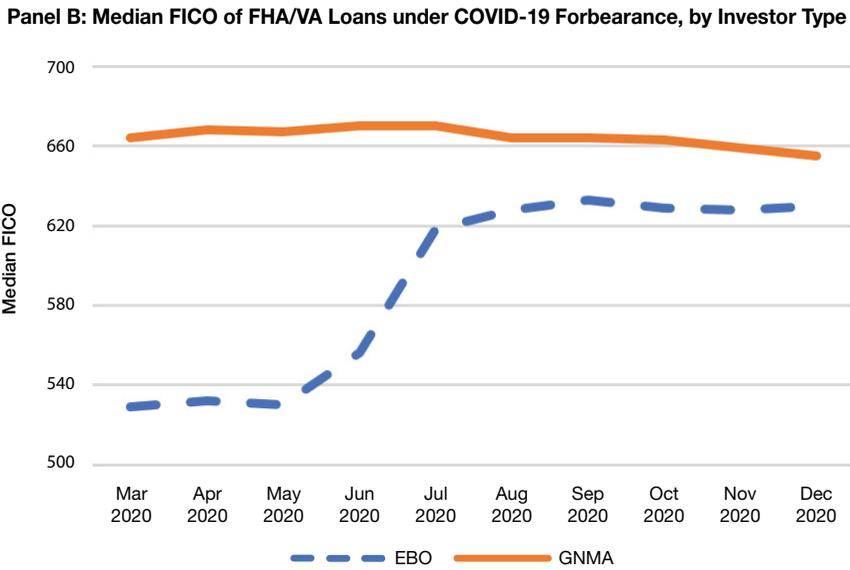
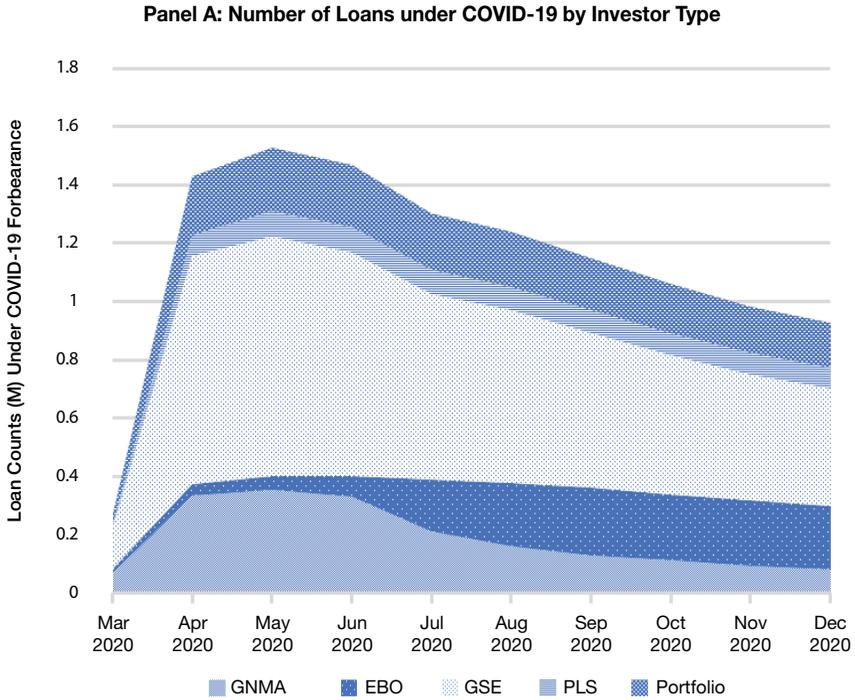
Panel A of exhibit 12 shows that the number of loans in EBO status started to increase in July 2020 and have since stayed elevated; this rise directly coincided with the decline in GNMA loans. Approximately 200,000 borrowers with a combined \$40 billion balance are in EBO status as of December 2020.

³¹ A series of sub-sample analyses were conducted with forbearance and payment status lagged by 1 month; the results suggest that the negative effect of forbearance on prepay and the salvaging effect of payment under forbearance is larger for borrowers with higher credit scores. The negative effect of nonpayment under forbearance is greater for portfolio loans than for FHA loans, but the salvaging effect of payment under forbearance is comparable between portfolio loans and FHA loans.

³² GSEs and GNMA have policies on the length that servicers face such obligations; programs have also been in place to support servicers.

Exhibit 12

Banks' Use of GNMA Buyouts



EBO = early buyout. GNMA = Ginnie Mae. GSE = government sponsored entities. PLS = private-label securitizations.

Notes: FICO refers to current FICO of borrowers.

Source: FRB Y-14 with observation months from February to December 2020

Panel B of exhibit 12 shows that the median (current) FICO scores of GNMA borrowers under forbearance were at 660 and declined over time, reflecting the exit of borrowers with greater scores. Starting in June 2020 and stabilizing in July 2020, the median borrowers in EBO who were under forbearance sharply increased, from 530 in early 2020 to close to 630 in later 2020, reflecting the fact that FHA/VA borrowers with relatively high credit scores also entered forbearance. Overall, EBO loans have lower FICO scores than GNMA loans, consistent with an interpretation that FHA/VA borrowers with lower credit scores are more adversely affected by the pandemic—utilizing forbearance more and making fewer payments—and thus are disproportionately eligible to be bought out.

Why do servicers engage in buying out loans in GNMA securities and putting them on their own balance sheets? A major factor is the lower funding costs of holding them on balance sheets due to the historically low interest rate during the COVID-19 era. Second, servicers can save the advance expenses that they incur on the nonpaying borrowers, including those under COVID-19 forbearance. Third, servicers can attempt to complete modification/cure and securitize them again, with possible favorable gains upon sale. Further examining of servicers' behavior in the economics of EBO during the COVID-19 era can be a fruitful research area.³³

Conclusion

This report aims to examine the benefits and the potential costs of the COVID-19 mortgage forbearance programs. Analyzing forbearance entry, exit, and performance after exit using the loan level data serviced by the 18 largest depository servicers yields several findings. First, borrowers with lower credit scores and facing greater unemployment shocks utilized forbearance more; borrowers with greater credit scores exited forbearance faster, and forbearance exits were responsive to an improving labor market; and borrowers' post-forbearance serious delinquency rates were low with the assistance from COVID-19 deferral programs. This evidence suggests that COVID-19 forbearance programs reached those most vulnerable to the economic fallout from the pandemic.

Second, there is heterogeneity in borrowers' entry and exit responses to the unemployment shock; borrowers with the highest credit scores had extra positive entry response to the rise in unemployment rates but were less responsive to improvement in employment in their exits; borrowers with lower credit scores were more responsive to improvement in employment in their exit behavior. These pieces of evidence suggest that although the forbearance programs provided support to borrowers adversely affected by the COVID-19 pandemic, they also allowed some to take precautionary actions or accumulate liquidity; the effect of COVID-19 forbearance programs varies across borrowers.

Third, nonpayment under forbearance had an adverse impact on borrowers' ability to refinance, but this effect was materially alleviated by renewed consecutive payments after exiting forbearance. This evidence highlights the importance of designing policies to provide forborne borrowers opportunities to accumulate wealth while enabling borrowers' payment pauses.

³³With EBO loans on servicers' balance sheet, whether EBO and GNMA loans perform differently and how loans exit EBO are questions worth examining. These are left for future research when more performance data are available.

There remain many questions unanswered about forbearance: might forbearance generate an unintended consequence of ameliorating borrowers' incentives to look for jobs? Did borrowers utilizing mortgage forbearance to pay down other debts or save them for downpayment for new home purchases and thus contribute to the imbalance in the housing market? These questions are left for future research.

Appendix

Exhibit A1

Estimated Coefficients in COVID-19 Forbearance Entry Baseline Regression (exhibit 4)				
Dep. Var.: Forbearance Entry	Class Variable	Estimate	StdErr	
Refreshed LTV (omitted group: <=30)	Missing	- 0.09**	0.03	
	30-40	- 0.13***	0.01	
	40-50	- 0.05***	0.01	
	50-60	0.02**	0.01	
	60-70	0.09***	0.01	
	70-80	0.15***	0.01	
	80-90	0.23***	0.01	
	90-100	0.35***	0.01	
Debt to income (omitted group: <0.15)	>100	- 0.24***	0.03	
	0.15-0.21	- 0.16***	0.01	
	0.21-0.29	0.00	0.01	
	0.29-0.41	0.17***	0.01	
Loan type (omitted group): conventional w/o PMI	> 0.41	0.32***	0.01	
	Missing	- 0.04***	0.01	
	FHA	0.16***	0.01	
	VA	- 0.29***	0.01	
	Cvtl w PMI	0.06***	0.01	
Status (lag) was Current	Other	0.11***	0.01	
		- 1.13***	0.01	
	Loan Purpose (omitted group: Purchase)	Refi: rate/term	- 0.02	0.02
	Refi: cash-out	0.02	0.02	
Loan Source (omitted group: Retail)	Refi: home improve	0.02	0.03	
	Other	- 0.04*	0.02	
	Broker	0.27***	0.03	
	Correspondent	0.20***	0.03	
Loan Product (omitted group: FRM 30 year)	Svcg right purchased	0.12***	0.03	
	FRM 15 year	- 0.18***	0.01	
	FRM 40 year	0.17***	0.01	
	ARM	- 0.06***	0.01	
Documentation (omitted: full)	Other	0.23***	0.01	
	Low	0.12***	0.01	
	No	0.17***	0.01	
Negative Amortization (omitted group: yes)	Missing	- 0.66***	0.12	
	Yes	0.20***	0.04	
Prepayment Penalty	Missing	- 0.03	0.39	
AUC	Yes	- 0.21***	0.02	
Observations		0.814		
		17.7M		

AUC = Area under the ROC curve. FHA = Federal Housing Administration. FRM = fixed rate mortgage. LTV = loan to value ratio. PMI = private mortgage insurance. VA = Veterans Administration. *** = statistically significant at the 1-percent level.

Source: 10 percent sample of FRBY-14, February 2020-December 2020

Exhibit A2

Robustness Checks on Forbearance Exit Regressions

Dep. Var.:	(1) Forbearance Exit by Non-Prepay		(2) Forbearance Exit by Prepaying	
Variable	Estimate	StdErr	Estimate	StdErr
Intercept	- 26.44*	14.96	- 39.29	65.67
FICO Current, lag	580-619 - 0.20***	0.01	- 0.37***	0.06
	620-679 - 0.05***	0.01	- 0.04	0.04
	680-719 0.10***	0.01	0.30***	0.04
	720-759 0.20***	0.01	0.46***	0.04
	760+ 0.39***	0.01	0.43***	0.03
	Missing - 0.07***	0.02	- 0.21***	0.07
Unemployment Rate	-0.06***	0.00	-0.03	0.00
Servicer, State Fixed Effects	Yes		Yes	
Estimation Method	Multinomial Logit		Multinomial Logit	
Observations	1.53 Million			

* = statistically significant at the 10-percent level. *** = statistically significant at the 1-percent level.

Note: Borrower/loan attributes were included.

Source: 10 percent sample of FRBY-14, February 2020–December 2020.

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