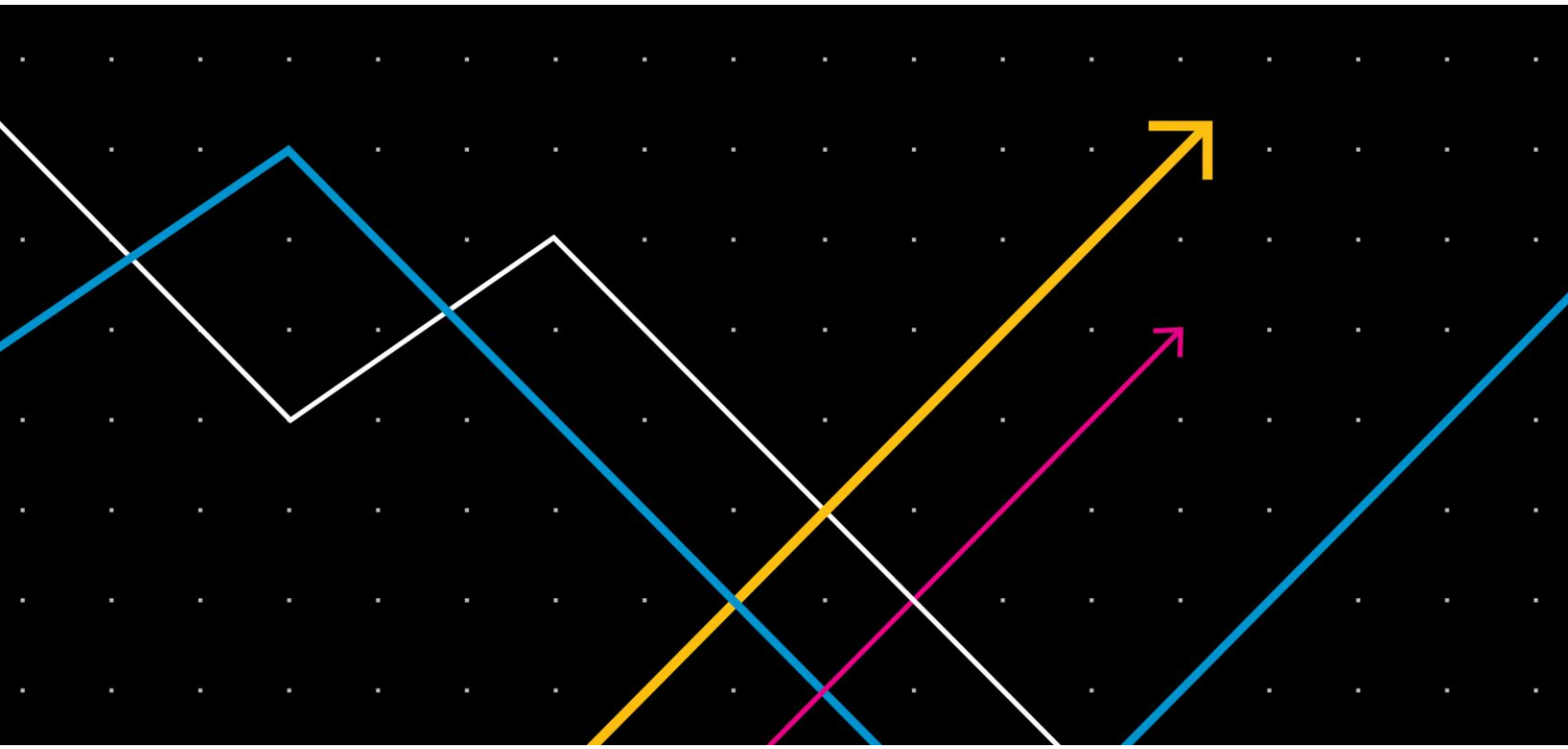

RESEARCH REPORT

Improvements in the Loss Mitigation Toolkit Can Allow for Enhanced Access to Credit

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Improvements in Loss Mitigation

Since the financial crisis, there have been significant advancements in the loss mitigation process, including the standardization of loss mitigation protocols and the introduction of forbearance and deferral options. These forbearance and deferral measures permit borrowers to temporarily suspend their mortgage payments with minimal documentation required, with the provision to append the missed payments to the end of the mortgage.[1] The COVID-19 pandemic provided an extensive opportunity to apply these enhanced loss mitigation processes, originally developed for natural disaster relief. The enhanced loss mitigation waterfall, incorporating forbearance and deferral, has become a permanent and obligatory component of the toolkit for the government-sponsored enterprises (GSEs), effective October 31, 2023.[2]

The pandemic's forbearance policy marked the first large-scale implementation of these forbearance and deferral measures. Although this approach proved successful, the low foreclosure rate benefited significantly from robust home price appreciation. In addition, mortgage servicers without federal guarantees or insurance were not mandated to offer similar relief for these mortgages, but many servicers opted to do so during the pandemic. We want to establish how much of the low foreclosure rate is attributable to the improved loss mitigation toolkit, as this will allow us to calibrate our expectations now that the programs have been made permanent.

Several studies have illuminated the pandemic's impacts on mortgage borrowers and the consequences of forbearance. Davydiuk and Gupta (2021) demonstrated that high-income individuals were more able to stay at home and limit their mobility compared with low-income individuals during the pandemic. Those with high debt burdens who were unable to work from home but needed income to manage their debts contributed to the inequity between higher- and lower-income households. An and coauthors (2022) highlighted that the pandemic intensified inequalities between low-income and high-income borrowers, as well as between Black and Hispanic borrowers and white borrowers. Despite being more likely to miss payments, lower-income borrowers and borrowers of color used forbearance more frequently than middle- and higher-income borrowers and white borrowers. Gerardi, Lambie-Hanson, and Willen (2022) found that COVID-19 forbearance policies were highly beneficial, especially noting that even though borrowers of color and lower-income borrowers were more prone to miss payments, they were equally likely to adopt forbearance compared with white and higher-income borrowers. Additionally, Gerardi, Lambie-Hanson, and Willen (2021) observed that Black and Hispanic borrowers were significantly less likely than white borrowers to exit forbearance and resume payments. Goodman and Zhu (2023) discovered that forbearance policies had a more substantial

positive impact on assisting single borrowers in exiting delinquency and becoming current, compared with households with multiple borrowers during the COVID-19 pandemic.

Mortgage default, foreclosure, and liquidation constitute not a single event but rather a complex, uncertain process that ultimately leads to a resolution (Chan et al. 2014). This process unfolds in three stages: (1) the transition of the mortgage from current to serious delinquency, typically defined as being 90 days or more overdue (i.e., in default); (2) the progression from serious delinquency to foreclosure and subsequent property liquidation (liquidation following serious delinquency); and (3) the liquidation sale, which might include a foreclosure sale, an REO (real estate owned) sale, or an alternative to foreclosure such as a short sale or a deed in lieu of foreclosure.

The loss rate can be calculated using the following equation:

Loss rate = Probability of serious delinquency * probability of liquidation, given serious delinquency * severity, given liquidation (1)

Many researchers have examined the factors contributing to mortgage default or serious delinquency (stage 1) and the effects of forbearance policies on mortgage recovery. Farrell, Bhagat, and Zhao (2018) demonstrate a strong correlation between default and income drops, noting that borrowers often tap into their savings to postpone default following negative income shocks. Ganong and Noel (2020) find that 94 percent of defaults stem, at least in part, from negative life events, with 70 percent attributed solely to such events and 24 percent resulting from dual triggers (negative equity and life events). Low (2022) underscores the significance of life events in defaults, citing unexpected expenses, job loss, large debt payments, illness, disability, and death as the most common causes, while highlighting that negative equity is seldom a factor.

In this report, we focus on how forbearance policies affect borrowers experiencing serious delinquency. Using Fannie Mae's Single-Family Loan Performance dataset, we observe that for loans in serious delinquency status in 2016, the average transition rate to foreclosure and liquidation is around 23 percent. Further analysis of seriously delinquent loans at the onset of the COVID-19 pandemic in 2020 reveals that the average transition rate to foreclosure liquidation for loans without forbearance is 15 percent, while the average foreclosure rate for loans granted forbearance is 3 percent, representing a 12 percentage-point difference. Our findings regarding the comparison between 2016 and 2020 liquidation rates align with those of Fratantoni (2020), indicating a steady decline in serious delinquency and foreclosure rates in the decade following the financial crisis, attributed to a robust job market, low interest rates, and a flourishing housing market.

We also employ regression methods to isolate the impact of forbearance on foreclosure liquidation and empirically demonstrate that these enhancements to loss mitigation can reduce the transition rate from serious delinquency to foreclosure by 46 percent, marking a significant improvement. These results are broadly consistent with those of Cherry and coauthors (2021), who show that two mortgage forbearances are associated with one missing default (liquidation).

Moreover, assuming that pricing and loss severity, given liquidation (stage 3), remain constant, reducing the transition rate (stage 2) should enable an increase in the percentage of loans that become seriously delinquent (stage 1) by a roughly equivalent amount, resulting in the same expected loss rate. More specifically, lenders could responsibly expand access to credit by accepting some borrowers who would have otherwise been rejected while maintaining expected losses. In this report, we quantify the expansion in credit facilitated by enhanced loss mitigation using three different scenarios: lenders could widen the credit box and allow at least 300,000 mortgage borrowers per year into the homebuying market, with the potential for considerably more, depending on the form of expansion.

The outline of this report is as follows: the second section discusses the evolution of loss mitigation; the third section details our data, empirical methodology, and analysis of how forbearance and deferral reduce the transition rate from serious delinquency to foreclosure; the fourth section estimates the credit box expansion resulting from the lower transition rate; and the final section presents policy recommendations.

Background on Forbearance

Before the 2008 financial crisis, there was no standardized loss mitigation toolkit. Short-term assistance programs such as repayment plans and forbearance plans were available ad hoc. Borrowers were often confused about when they were supposed to repay this temporary relief and were often unprepared for the payment shock they would experience. This confusion was compounded when servicers often added delinquent interest and fees to the balance. The financial crisis highlighted the need for a standardized loss mitigation toolkit.

After the crisis, the US Treasury Department developed a suite of programs as part of its Making Home Affordable program.[3] These programs included the Home Affordable Modification Program (HAMP), the first standardized loss mitigation waterfall, designed to modify mortgages by permanently reducing borrowers' payments, as well as the Home Affordable Foreclosure Alternatives program (HAFA), which provided servicers financial incentives to pursue alternatives to foreclosure. The

standardization was key, even though only 1.7 million borrowers received HAMP modifications and an additional 6.7 million borrowers received proprietary modifications, with many taking guidance from HAMP (Bruce 2022).[4] The modification processes became increasingly streamlined, with a reduction in the required documentation. Fannie Mae and Freddie Mac both had a streamlined mortgage modification process in place by 2013. These modifications had a higher take-up rate but a lower success rate than modifications with more extensive documentation. On balance, the success rate on mortgage modifications increased by 34 percent (Goodman, Scott, and Zhu 2018).

But for most of the postcrisis period, the short-term assistance plans (i.e., repayment and forbearance plans) remained distinct from the permanent modification plans. They were combined for the first time in 2018, in response to Hurricanes Harvey, Irma, and Maria in 2017. Borrowers did not know whether they needed temporary or permanent relief; forbearance for up to two consecutive six-month terms was placed at the top of the loss mitigation waterfall for areas that had experienced a natural disaster. And the repayment order for this forbearance was clear: if the borrower could pay the funds back when they exited forbearance, they should do so, and if they could repay through an increase in mortgage payments for a time, they should do so. If not, and the borrower could make their old payment, the missed payments were added to the end of the life of the mortgage (deferral). If the borrower could not make the old payment, they were considered for a mortgage modification.

When the COVID-19 pandemic struck, the natural disaster loss mitigation waterfall was immediately adopted as the pandemic waterfall. The GSEs announced on March 18, 2020, that the more flexible forbearance and modification policies that applied to natural disasters would apply during the pandemic. The GSEs would allow two consecutive six-month forbearance terms. And the GSEs issued guidance that servicers must suspend credit bureau reporting of delinquencies related to COVID-19 forbearance, repayment, or trial modification plans. At the same time, a foreclosure moratorium was adopted.

The Coronavirus Aid, Relief, and Economic Security (CARES) Act was signed into law on March 27, 2020. The March 20 GSE announcement was the blueprint: the CARES Act required that a foreclosure and eviction moratorium be implemented and required that forbearance for up to 12 months be available for all federal mortgages, including Federal Housing Administration, US Department of Veterans Affairs, and US Department of Agriculture loans, as well as GSE loans. Borrowers could request forbearance by telling their servicer that they experienced a financial hardship directly or indirectly attributable to COVID-19. Servicers were required to suspend credit bureau reporting of delinquencies attributable to COVID-19 forbearance, repayment, or trial modification plans.

Mechanically, a borrower could elect COVID-19 forbearance to pause their monthly payments. The payments would be paused for a specified period, typically 3 to 6 months, but the borrower could request an extension for up to a 12-month total forbearance period. After the CARES Act, further enhancements allowed GSE borrowers who went into forbearance before February 28, 2021, to be in forbearance for up to 18 months.[5]

As the borrower exited forbearance, several options were available, depending on the borrower's financial situation. The servicer would first ask the borrower whether they could pay the missed payments back as a lump sum or pay a higher mortgage payment than they were making before; if so, the missed payments would be paid back when forbearance ended or would be amortized over a short period. Few borrowers could make either an immediate payment or a higher payment for a time. If the borrower could make their old payment, the missed payments—principal, interest, taxes, and insurance—would be added to the end of the life of the mortgage. For GSE mortgages, the loan would be extended by the number of missed payments. If the borrower prepaid because of a sale or by refinancing, the money would be repaid at that point. Borrowers who could not make their old payment would be eligible to be considered for a modification.

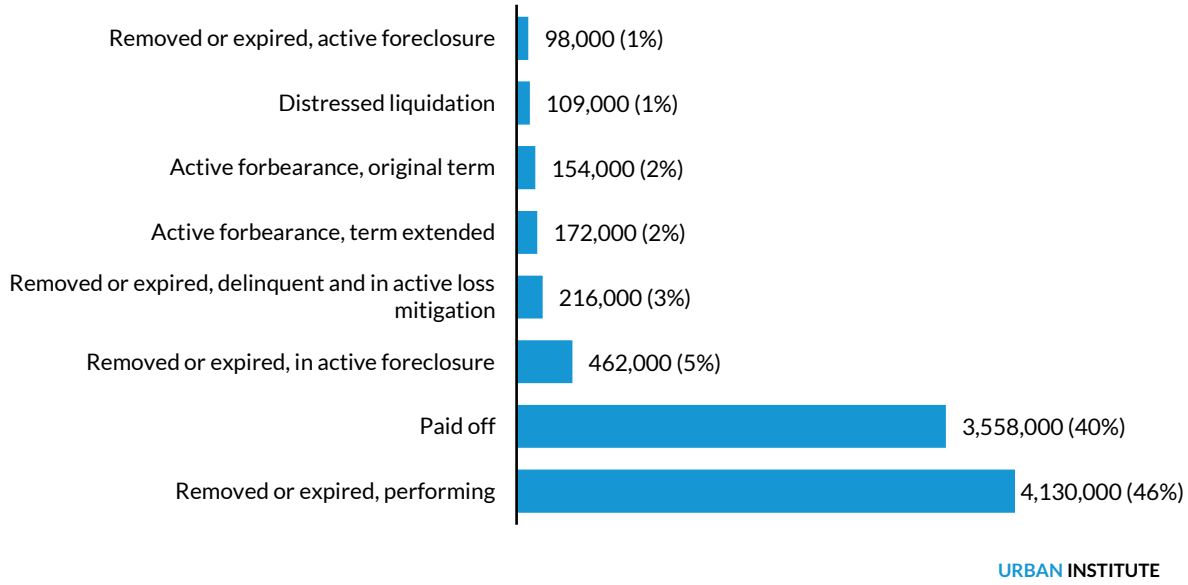
Borrowers who were already delinquent going into the pandemic could ask for forbearance, attesting to the fact that they were affected by the COVID-19 crisis. Of the borrowers who were delinquent before March 2020, more than a quarter never requested forbearance. These pandemic policies were in force until early 2023, though most borrowers who elected forbearance did so in March or April 2020.

Loan-level performance data from ICE Mortgage Technology shows positive outcomes of the COVID-19 forbearance (figure 1). As of March 2024, of the 8.9 million borrowers who went into forbearance, 4.1 million (46 percent) of the mortgages were performing, 3.6 million (40 percent) were paid off, and 0.32 million (4 percent) were still in active forbearance—2 percent were in the original term, and another 2 percent had their term extended. Of the remaining loans, 5 percent were delinquent, 3 percent were in active loss mitigation, and 2 percent apiece were in active foreclosure or had a distressed liquidation.

FIGURE 1

ICE Mortgage Technology Estimates of Forbearance Outcomes

8.9 million forbearances



Source: Loan-level data from the contributory ICE McDash Flash daily mortgage performance database.

Given the success of the forbearance programs, the GSEs made forbearance a permanent part of the loss mitigation toolkit. Beginning on an optional basis on July 1, 2023, and required by October 1, 2023, the new permanent policies allow for up to 12 months of forbearance (a 6-month initial period, with up to additional 6 months). Just as with COVID-19 forbearance, the borrower need not be delinquent to apply. This "standard forbearance" has the same exit options as during the pandemic (pay back immediately if possible; if not, and the borrower can afford an increased monthly payment, pay back in a short period; if not, but the borrower can afford to make the old payment, add the missed payments to the end of the life of the mortgage; if the borrower cannot afford the old payment, consider the borrower for a modification). Unlike COVID-19 forbearance, though, if the borrower is delinquent and on a forbearance plan, the loan would still be reported as delinquent to the credit bureaus.

With forbearance becoming a permanent part of the loss mitigation waterfall, we wanted to look at how much the pandemic policies actually lowered the rate at which mortgages move from serious delinquency to foreclosure. Losses will be smaller because fewer loans will transition from serious delinquency to default. This will, in turn, allow us to look at how much we could expand access to credit, holding losses constant.

How Forbearance Affects the Transition into Foreclosure

Data and Summary Statistics

We conducted our empirical analysis using Fannie Mae's Single-Family Loan Performance database, chosen for its extensive size and high data quality. The data are published quarterly, with the most recent dataset being from the second quarter of 2023. Fannie Mae and Freddie Mac loans constituted approximately 35 percent of all mortgages in forbearance. Although Fannie Mae and Freddie Mac mortgages are very similar, Fannie Mae insures more loans, so the Fannie Mae database contains a larger dataset. The dataset encompasses detailed information on mortgage borrowers, including FICO scores, first-time homebuyer status, and whether multiple borrowers applied for a single loan. Additionally, the database records each loan's credit characteristics at origination, such as origination amount, original loan-to-value (LTV) ratio, debt-to-income (DTI) ratio, property type, loan purpose, and geographic area. Crucially, the database tracks each loan's performance alongside forbearance incidence, which is essential for identifying loans entering forbearance and their delinquency status over our sample period.

Fannie Mae's loan-level database encompasses data on almost all of Fannie Mae's 30-year fully amortizing, full-documentation, single-family, conventional fixed-rate mortgages. These data were initially released in 2013 to support Fannie Mae's credit risk transfer programs, and the database offers loan-level detail dating back to 1999, providing insights into the credit performance of a significant portion of Fannie Mae's single-family portfolio. The most recent data reflect mortgage performance up to June 2023.

For our analysis, we examined three groups of loans:

1. those that were up to 60 days delinquent (current; 30 days delinquent, or D30; or 60 days delinquent, or D60) in January 2020, became 90 days or more delinquent (D90+) in 2020, and opted for forbearance in 2020
2. those that were up to 60 days delinquent (current, D30, or D60) in January 2020, became 90 days or more delinquent (D90+) in 2020, but did not opt for forbearance in 2020
3. those that were up to 60 days delinquent (current, D30, or D60) in January 2016 and became 90 days or more delinquent (D90+) in 2016

For groups 1 and 2, we tracked loan performance through the second quarter of 2023, or 3.5 years after their initial appearance without serious delinquency in January 2020. For group 3, we tracked loan performance through the second quarter of 2019, covering the same 3.5 years after their appearance in January 2016. Notably, because there was no forbearance program in 2016, loans in group 3 were unable to opt for forbearance.

We classified loan outcomes into two categories:

1. Liquidation, including loans where the home was liquidated, in foreclosure, or remained at least six months delinquent (D180+) at the end of the observation period. Losses will be associated with loans in this group.
2. Recovery, comprising loans where the borrower is current, is less than six months delinquent, or has prepaid. No loss is associated with loans in this group.

We could not determine outcomes for some loans, as the delinquent or reperforming loan was sold through loan sales or note sales, and we excluded both these groups from the analysis.

TABLE 1
Summary of Data

Group	Loan count	Liquidation rate	Median FICO score	Median LTV ratio	Median interest rate	Median DTI ratio
Forbearance in 2020	487,726	3%	724	80%	4.375%	40%
No forbearance in 2020	18,950	15%	707	80%	4.525%	39%
2016	69,606	23%	687	79%	5.750%	39%

Source: Urban Institute calculations from Fannie Mae single-family loan performance data.
Note: DTI = debt-to-income; LTV = loan-to-value.

Table 1 presents a comprehensive analysis of data from three distinct groups: borrowers who opted for forbearance in 2020, those who did not, and loans that were delinquent in 2016. This analysis illuminates the varied impact of forbearance measures on loan performance, borrower creditworthiness, and the terms of their loans. The forbearance group, encompassing approximately 488,000 loans that became delinquent (D90+), showcased a notably low liquidation rate of 3 percent. This suggests that forbearance measures were instrumental in helping a significant number of borrowers stave off foreclosure. Conversely, the nonforbearance group in 2020, with around 19,000 loans falling into delinquency, experienced a higher liquidation rate of 15 percent. This indicates that the lack of forbearance options adversely affected their loan performance. The loans originating in

2016, with nearly 70,000 delinquencies, exhibited the highest liquidation rate among the groups (23 percent).

Examining borrower creditworthiness among the 2020 loans, the group that took forbearance had a median FICO score of 724, while the score for those without forbearance was 707. Other characteristics were similar. Both groups shared the same median LTV ratio of 80 percent. The median DTI ratio for the forbearance group was 40 percent, compared with 39 percent in the group that did not opt for forbearance in 2020.

Despite the evidence that borrower characteristics such as median FICO scores, LTV ratios, or DTI ratios do not significantly affect forbearance take-up in 2020, the analysis reveals differences in loan performance outcomes. These differences show the importance of forbearance as a protective measure against loan liquidation, particularly during periods of economic uncertainty. To fully understand the implications of these results, we must examine the liquidation rates in the context of various loan characteristics, highlighting how borrower decisions and economic conditions affect loan outcomes.

TABLE 2

Liquidation Rates, by Loan Characteristics

		MTMLTV Ratio							
		≤ 70%		70–80%		80–90%		> 90%	
Group	FICO score	*N*	Liq. rate	*N*	Liq. rate	*N*	Liq. rate	*N*	Liq. rate
Forbearance in 2020	≤ 700	102,345	3.7%	30,917	3.9%	20,088	4.8%	11,402	5.7%
	700–750	87,083	2.2%	32,332	2.1%	22,482	2.9%	15,421	3.5%
	> 750	103,049	1.4%	27,569	1.3%	17,072	2.1%	10,273	1.9%
	All	292,477	2.4%	90,818	2.5%	59,642	3.3%	37,096	3.7%
No forbearance in 2020	≤ 700	6,386	14.3%	1,114	16.2%	657	21.5%	255	31.4%
	700–750	3,745	12.6%	776	16.6%	438	21.2%	261	25.7%
	> 750	3,791	11.9%	570	18.8%	307	24.1%	158	32.9%
	All	13,922	13.2%	2,460	16.9%	1,402	22.0%	674	29.5%
2016	≤ 700	24,682	17.8%	6,767	23.9%	4,226	29.2%	3,609	38.8%
	700–750	9,788	18.4%	3,092	27.2%	2,159	30.2%	1,308	43.4%
	> 750	7,086	20.9%	2,063	34.1%	1,314	39.5%	677	49.0%
	All	41,556	18.5%	11,922	26.5%	7,699	31.2%	5,594	41.1%

Source: Urban Institute calculations from Fannie Mae single-family loan performance data.
Note: liq. = liquidation; MTMLTV = mark-to-market loan-to-value.

Table 2 displays the liquidation rates for each of the three loan groups, categorized by FICO score and mark-to-market LTV (MTMLTV) ratio brackets. The MTMLTV ratio is derived by estimating the current LTV ratio when the loan initially enters our observation period, either in January 2020 or January 2016. The MTMLTV ratio is computed by updating the home value using the ICE home price index database at the three-digit zip code level.

The MTMLTV ratio significantly influences the liquidation rate. For instance, among loans that opted for forbearance in 2020 that had MTMLTV ratios up to 70 percent, the average liquidation rate was 2.4 percent. Conversely, for loans with MTMLTV ratios from 70 to 80 percent, the average liquidation rate was 2.5 percent, and for loans with MTMLTV ratios above 90 percent, the average liquidation rate rose to 3.7 percent.

Similarly, FICO scores affect the liquidation rate. Consider the loans from 2020 that chose forbearance and had MTMLTV ratios from 70 to 80 percent. The average liquidation rate for this group is 2.5 percent, compared with 1.3 percent for borrowers with FICO scores exceeding 750 and 3.9 percent for borrowers with FICO scores of 700 or below.

In addition to using the updated LTV indicator, we explore liquidation rates based on home price appreciation paths. This involves considering the home price appreciation from the time of purchase to our initial observation in the sample. Home price appreciation paths are categorized into three groups: less than or equal to 0 percent, 0 to 20 percent, and greater than 20 percent. Borrowers experiencing the lowest home price appreciation exhibit the highest liquidation rates (table 3).

TABLE 3

Liquidation Rates, by FICO Score and Home Price Appreciation

		Home Price Appreciation					
		≤ 0%		0–20%		> 20%	
Group	FICO score	*N*	Liq. rate	*N*	Liq. rate	*N*	Liq. rate
Forbearance in 2020	≤ 700	11,819	4.8%	106,491	4.0%	46,442	3.8%
	700–750	11,402	2.6%	100,884	2.4%	45,032	2.3%
	> 750	10,202	1.5%	91,455	1.5%	56,306	1.5%
	All	33,423	3.1%	298,830	2.7%	147,780	2.5%
No forbearance in 2020	≤ 700	619	23.4%	4,400	17.2%	3,393	12.1%
	700–750	331	23.0%	2,725	16.1%	2,164	11.3%
	> 750	297	21.5%	2,282	15.9%	2,247	11.5%
	All	1,247	22.9%	9,407	16.6%	7,804	11.7%
2016	≤ 700	15,082	28.0%	17,082	20.0%	7,120	14.1%
	700–750	5,070	31.4%	8,169	23.0%	3,108	12.5%
	> 750	3,185	38.7%	5,767	25.8%	2,188	14.3%
	All	23,337	30.2%	31,018	21.9%	12,416	13.8%

Source: Urban Institute calculations from Fannie Mae Single-family loan performance data.
Note: liq. = liquidation.

Liquidation Regression Results

To separate the influence of forbearance from the attributes of the underlying loan, we employ regression analysis to investigate the liquidation rate in relation to the forbearance program.

Specifically, we estimate an ordinary least squares regression model for the mortgage liquidation rate. Our dependent variable is represented by a dummy variable, L, which equals 1 if the loan was liquidated through foreclosure or reached D180+ status as of June 2023, and equals 0 otherwise. In equation 2, we introduce a forbearance indicator to assess the efficacy of forbearance for borrowers.

$$\Pr(L_i = 1) = \Pr\left(\alpha + \mu * F_i + \gamma * Group_i + X_i'\beta + \varepsilon_i\right) \quad (2)$$

F represents the forbearance indicator. The coefficient of interest, denoted by μ, quantifies the impact from forbearance on foreclosure liquidation. Group serves as an indicator of our sample period, taking the value of 1 if the loan is from the 2020 sample and 0 if it belongs to the 2016 sample. Additionally, we incorporate standard mortgage and borrower characteristics as independent variables. For instance, we include initial LTV ratios and FICO scores from the loan file at origination in the analysis.

TABLE 4

Liquidation Regression Results

	(1)		(2)		(3)	
Parameter	**Estimate**	**Standard error**	**Estimate**	**Standard error**	**Estimate**	**Standard error**
Forbearance	-18.8%***	0.0008	-11.7%***	0.001	-10.6%***	0.001
Group: 2020			-6.3%***	0.001	-3.8%***	0.002
Other controls	No		No		Yes	

Source: Urban Institute calculations.

*** $p < 0.001$.

Table 4 presents the outcomes of this examination, delineated into three specifications. Across all three specifications, forbearance exhibits a negative coefficient, signifying its role in helping seriously delinquent borrowers avoid foreclosure. To elaborate, without any controls, forbearance decreases the transition rate from serious delinquency to foreclosure liquidation by 19 percentage points. After the introduction of year group fixed effects, this effect diminishes to 11.7 percent, with an additional 6.3 percent attributable to the year group fixed effect. In specification 3, we incorporate credit score, MTMLTV ratio, interest rate, DTI ratio, loan purpose, origination year, state indicator, first-time homebuyer status, occupancy status, and home price appreciation since origination. Under this specification, the effect declines to 10.6 percentage points.

TABLE 5

Robustness Check with FICO Categories

	FICO score < 700		FICO score 700–750		FICO score > 750	
Parameter	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Forbearance	-10.0%	0.003	-10.8%	0.003	-11.1%	0.003
Group: 2020	-2.1%	0.004	-4.7%	0.004	-8.1%	0.003
Other controls	Yes		Yes		Yes	

Source: Urban Institute calculations.

One reasonable question would be whether the impact of forbearance remains consistent across various loan characteristics. In this report, we conducted a robust examination of creditworthiness, specifically exploring whether forbearance yields a consistent impact across different FICO scores. Our analysis included a comprehensive robustness check, where we scrutinized various aspects to ensure the reliability and validity of our findings. The results are consistent across different FICO categories (table 5). Our baseline shows a 10.6 percent forbearance impact. For FICO scores below 700, the impact is 10 percent; for scores between 700 and 750, it is 10.8 percent; and for scores above 750, it is 11.1 percent—all very close to our baseline. Thus, we will use 10.6 percent for our further analysis.

These values represent the percentage-point reduction in the transition rate from serious delinquency to liquidation, not the percentage reduction of this value itself. To gauge how much forbearance could expand the credit box to offset the decline in transition rates, we must convert this percentage-point reduction into a percentage reduction. To do this, we use the year 2016 as a baseline. The average liquidation rate for loans in 2016 with a history of serious delinquency stood at 23.2 percent. According to the regression findings, forbearance reduces this by 10.6 percentage points, or a 45.6 percent reduction (10.6 / 23.2).

Implications for Expanding the Credit Box

To assess the impact on the credit box, we must account for all elements contributing to credit loss. Broadly, total credit losses comprise three key components: the probability of serious delinquency (D); the probability of liquidation, given serious delinquency (L); and the severity of loss, given liquidation (S). These components interact multiplicatively (equation 3).

$$\text{Loss Rate}_{\text{i}} = \text{D}_{\text{i}} * L_i * S_i \tag{3}$$

To be more specific, for a given loan i, for a specific loan (i), its loss rate is determined by three main factors: (1) D, representing the percentage of loans that transition into serious delinquency (defined as

90 or more days delinquent in this report), (2) L, indicating the transition rate from D90+ to liquidation, and (3) S, representing the severity of loss if the loan undergoes liquidation.

Our analysis in the preceding section comprehensively examines the transition rate L. Here, we delve into analyzing the loss severity S. Table 6 presents the loss severity, given foreclosure liquidation, categorized by origination year. On average, the loss severity for all loans in the Fannie Mae database is 42 percent. But for loans originated during the crisis period (2005–08), the loss severity was 47 percent. One significant factor influencing loss severity is mortgage insurance; GSE loans with LTV ratios exceeding 80 percent, which require mortgage insurance, have a lower severity.

In our analysis of expanding the credit box, we assume no change in this variable. But this assumption may be conservative, as a significant proportion of the credit box expansion consists of loans with LTV ratios above 80 percent, which require mortgage insurance. This, in turn, tends to lower loss severity.

TABLE 6

Loss Severity, by Origination Year and LTV Ratio

Origination year	LTV ratio < 60%	LTV ratio 60–80%	LTV ratio > 80%	All
1999 to 2004	27%	41%	26%	34%
2005 to 2008	41%	53%	36%	47%
2009 to 2010	28%	38%	20%	33%
2011 to 2017	15%	25%	9%	16%
2018 and later	4%	7%	4%	5%
All	37%	49%	31%	42%

Source: Urban Institute calculations.
Note: LTV = loan-to-value.

To analyze the default rate D, we focus on two crucial determinants of the credit box: credit scores and LTV ratios. We segment our Fannie Mae mortgage data into 12 categories, leveraging the FICO score and LTV ratio buckets we previously used. These categories are formed by crossing FICO scores (≤ 700, 700–750, and > 750) with LTV ratios (≤ 70 percent, 70–80 percent, 80–90 percent, and > 90 percent).

Given our objective of expanding the credit box for homebuyers, we narrow the Fannie Mae database to include purchase loans exclusively. Subsequently, we perform an ordinary least squares regression on default rate based on origination years 2012 to 2017. Because our performance data extend until June 2023, these loans would have at least five years of performance data available. Our regression model for default is summarized by equation 4.

$$\Pr(D_i = 1) = \Pr\left(\rho + FICO, LTV_i'\omega + \varepsilon_i\right) \quad (4)$$

Table 7 shows the regression results.

TABLE 7

Default Regression Results

LTV ratio	FICO score	Estimate	Standard error
≤ 70%	≤ 700	8.8%***	0.0007
≤ 70%	700–750	3.7%***	0.0007
≤ 70%	> 750	1.2%***	0.0007
70–80%	≤ 700	9.7%***	0.0008
70–80%	700–750	4.4%***	0.0008
70–80%	> 750	1.7%***	0.0007
80–90%	≤ 700	11.5%***	0.0009
80–90%	700–750	5.4%***	0.0007
80–90%	> 750	2.2%***	0.0007
> 90%	≤ 700	13.8%***	0.0008
> 90%	700–750	6.7%***	0.0008
> 90%	> 750	3.1%***	0.0007

Source: Urban Institute calculations.
Note: LTV = loan-to-value.
*** $p < 0.001$.

The regression findings reveal that FICO scores exert a more significant influence on default rates than LTV ratios do. For instance, considering a specific LTV range, such as 70 to 80 percent, loans with FICO scores up to 700 exhibit a default rate of 9.7 percent. In contrast, if the FICO score exceeds 750, the default rate drops sharply to 1.7 percent, an 84 percent reduction ((9.7 – 1.7) / 9.7).

Conversely, when examining a fixed FICO score range, such as 700 to 750, loans with LTV ratios from 70 to 80 percent default at a rate of 4.4 percent, while those with LTV ratios exceeding 90 percent default at 6.7 percent, a 52 percent difference.

Now, let us consider hypothetical scenarios for expanding the credit box. Assuming a 45.6 percent reduction in the transition rate during the second stage of liquidation attributable to the forbearance program, we can approximate that in order to maintain total losses constant, we should expand the first stage of serious delinquency rate by 45.6 percent. This assumes the third stage, loss severity, remains

constant. Consequently, this suggests allowing for a 45.6 percent increase in the proportion of loans that transition into serious delinquency. For this analysis, we will use Fannie Mae purchase loans from 2020 to 2022.

TABLE 8

2020–22 Composition and Predicted Default Rate

LTV ratio	FICO score	Count	Actual composition	Predicted D90+
≤ 70%	≤ 700	62,023	1.5%	8.80%
≤ 70%	700–750	91,850	2.3%	3.71%
≤ 70%	> 750	450,588	11.2%	1.18%
70–80%	≤ 700	144,505	3.6%	9.66%
70–80%	700–750	284,714	7.1%	4.35%
70–80%	> 750	972,633	24.1%	1.69%
80–90%	≤ 700	78,623	2.0%	11.55%
80–90%	700–750	172,789	4.3%	5.43%
80–90%	> 750	376,521	9.3%	2.23%
> 90%	≤ 700	176,667	4.4%	13.79%
> 90%	700–750	504,993	12.5%	6.74%
> 90%	> 750	713,846	17.7%	3.07%
Total		4,029,752	100.0%	4.07%

Source: Urban Institute calculations.
Note: D90+ = 90 or more days delinquent; LTV = loan-to-value.

Table 8 displays the baseline number of loans from 2020 to 2022 alongside the count of loans within each category. For instance, there were 176,667 loans with FICO scores up to 700 and LTV ratios exceeding 90 percent, constituting 4.4 percent of the more than 4 million purchase loans during this period. The predicted default rate for this segment is 13.79 percent. Overall, from 2020 to 2022, the average forecasted default rate of the 4 million loans is 4.07 percent.

If we were to elevate the default rate by 45.6 percent, the average default rate would increase from 4.07 percent to 5.96 percent. To achieve this, we undertake three hypothetical exercises (table 9):

1. increasing the number of borrowers in the lowest FICO category (scores up to 700), while assuming the LTV distribution remains unchanged
2. increasing the number of borrowers in the highest LTV category (above 90 percent), while assuming the FICO distribution remains unchanged
3. increasing the number of borrowers with the worst combination of FICO score and LTV ratio (up to 700 and above 90 percent, respectively)

TABLE 9

Hypothetical Scenarios for Expanding the Credit Box

LTV ratio	FICO score	Increase for ≤ 700 FICO Score		Increase for > 90% LTV Ratio		Increase for 90% LTV Ratio and ≤ 700 FICO Score	
		Number	Share	Number	Share	Number	Share
≤ 70%	≤ 700	248,092	4.6%	62,023	1.1%	62,023	1.1%
≤ 70%	700–750	91,850	1.7%	91,850	1.7%	91,850	1.7%
≤ 70%	> 750	450,588	8.3%	450,588	8.3%	450,588	8.3%
70–80%	≤ 700	578,020	10.7%	144,505	2.7%	144,505	2.7%
70–80%	700–750	284,714	5.3%	284,714	5.3%	284,714	5.3%
70–80%	> 750	972,633	18.0%	972,633	18.0%	972,633	18.0%
80–90%	≤ 700	314,492	5.8%	78,623	1.5%	78,623	1.5%
80–90%	700–750	172,789	3.2%	172,789	3.2%	172,789	3.2%
80–90%	> 750	376,521	7.0%	376,521	7.0%	376,521	7.0%
> 90%	≤ 700	706,668	13.0%	2,120,004	39.1%	1,148,336	21.2%
> 90%	700–750	504,993	9.3%	6,059,916	111.9%	504,993	9.3%
> 90%	> 750	713,846	13.2%	8,566,152	158.2%	713,846	13.2%
Total		5,415,206	100.0%	19,380,318	100.0%	5,001,421	100.0%
Increase over 3 years		1,385,454	5.96%	15,350,566	5.41%	971,669	5.96%

Source: Urban Institute calculations.
Note: LTV = loan-to-value.

To increase the base probability of default from 4.07 percent to 5.96 percent , we can augment the number of loans with FICO scores up to 700 by 1.39 million over the three years. This adjustment elevates the total number of loans from 4.03 million to 5.42 million. Specifically, the number of loans with FICO scores up to 700 surges from 461,818 to 1,847,272, about a 400 percent increase. Under this assumption, each component bucket experiences a proportional rise—the up-to-700 bucket escalates from comprising 11 percent of total originations to 34 percent.

We then examine the theoretical augmentation of loans with LTV ratios greater than 90 percent. Given the lesser sensitivity of default to LTV ratio compared with FICO score, we observe a substantial increase in the overall number of loans. Even a 1,200 percent rise in this bucket fails to meet the 5.96 percent target default rate. This discrepancy reflects the predominance of loans with high FICO scores within the largest LTV bracket (above 90 percent), characterized by a low default rate.

Finally, our analysis extends to augmenting the number of loans in the riskiest category—those with FICO scores up to 700 and LTV ratios greater than 90 percent. We find that achieving a rise in the serious delinquency rate from 4.07 percent to 5.96 percent necessitates a 650 percent expansion solely within this bucket. Consequently, the number of loans in this category surges from 176,667 to 1,148,336, representing a shift from 4.4 percent of the total to 21.2 percent of the total. Over the three

years, this results in an overall increase of 971,669 loans, reflecting a 24 percent expansion, or 324,000 additional loans annually.

Conclusion and Implications of This Analysis

We have shown there is a sizeable decline in the transition rate from serious delinquency to liquidation because of the introduction of forbearance and payment deferral. This decline allows for a sizeable expansion of the credit box—at least 300,000 additional loans per year if only the riskiest bucket is expanded, and more loans if there is a broader expansion. The purpose of this exercise is not to suggest that the front end of the credit box must necessarily expand by the full extent of the decline in the transition rate, but the decline in the transition rate creates the opportunity to do so, without increasing the ultimate losses.

In fact, assuming that a 46 percent decline in the transition rate should lead to a 46 percent increase in the transition rate is an oversimplification. The real analysis is more complicated for several reasons.

- We have looked exclusively at GSE loans. It is not clear what share of the loans that constitute an expansion of our theoretical credit box would have otherwise been done as Federal Housing Administration loans.
- We have assumed the loss severity is constant regardless of the FICO scores and LTV ratios of the underlying loans. In fact, FICO scores play a small role in loss severity, but LTV ratios play a larger role. Higher-LTV loans have higher gross loss severities. Offsetting this, GSE loans with LTV ratios higher than 80 percent require mortgage insurance. Although the raw severities are higher, the mortgage insurance covers the first loss, leading to lower ultimate losses for the GSEs. For example, we showed that Fannie Mae loans with LTV ratios below 60 percent have a loss severity of 36.1 percent, those with LTV ratios from 60 to 80 percent have a loss severity of 48.5 percent, and those with LTV ratios over 80 percent have a loss severity of 31.1 percent. Incorporating this would require a more refined analysis.
- Forbearance itself is not costless to the GSEs. The payments are moved to the end of the life of the mortgage, so even if the loan is saved, there is a cost for the deferral of payments. Moreover, some loans that would not have liquidated in any event take advantage of forbearance. We would need to account for this cost. Our back-of-the-envelope calculation, contained in the appendix, indicates the cost of forbearance to the credit risk bearer would be

about 24 percent of the savings.[6] If we also consider the savings to the borrower and to the community, there is no net cost; the policy has a financial benefit,

Although this analysis suggests avenues for further research, the point remains: the reduction in the transition rate from serious delinquency to liquidation is substantial, which has large implications for the pricing of mortgage credit risk. Some of the benefit of the reduced cost of credit losses can be used to allow for a higher probability of borrower default; this would in turn allow for a sizable expansion of the front end of the credit box.

Appendix. The Costs of Forbearance

To calculate the costs of forbearance, we can think of five categories of loans, as shown in the first two columns of table A.1.

TABLE A.1

Loan Disposition, Cost, and Probability

Loan disposition	Cost of forbearance	Probability
Borrowers who selected forbearance and were "saved" as a result	Deferral of the mortgage payments, taxes, and insurance, plus any servicer incentives	8.5%
Borrowers who selected forbearance but did not need it, as they would have recovered without forbearance	Deferral of the mortgage payments, taxes, and insurance, plus any servicer incentives	30.8%
Borrowers who selected forbearance and did not recover	Liquidation timeline extended by forbearance period	9.9%
Borrowers who did not select forbearance and recovered	None	42.6%
Borrowers who did not select forbearance and liquidated	None	4.6%

For the loans that took forbearance (whether or not they needed it) and did not liquidate, the cost is the deferral of the mortgage payments, taxes, and insurance, plus any servicer incentives. For the loans that took forbearance and liquidated anyway, forbearance extended the liquidation timeline. There are no additional costs for loans that did not elect forbearance.

In Alexandrov, Goodman, and Tozer (2022), we provided a methodology for estimating these costs. For the first two categories of loans, the cost of forbearance is the cost of deferring the payments until the end of the life of the mortgage. Families generally do not live in their home for 30 years and may pay off their mortgage before they move. For our analysis, we assume an eight-year average life. We further assume a $250,000 loan with a 4 percent interest rate (payments of $1,194 per month), plus 1.75 percent in taxes and insurance ($365 per month), for a total payment of $1,559 per month. If the borrower misses six months of payments, the total value of those payments is $9,352. But the payments are not lost; they are delayed for eight years. The "cost" of this delay, assuming a 5 percent market interest rate, is $3,022, or 1.21 percent of the loan amount. In addition, the servicer is paid a $500 incentive payment, for a total cost of $3,522, or 1.41 percent of the loan amount.

For loans that took forbearance and liquidated anyway, we assume the timeline is extended by the length of time of the forbearance and that there is a small amount of excess depreciation on the property. Following Alexandrov, Goodman, and Tozer (2022), we assume a total cost of 0.5 percent per

month on these loans (6 percent per year)—the missed mortgage payments plus taxes and insurance plus a small amount of excess depreciation. Thus, the cost of six months' delay would be 3.0 percent of the loan amount.

Now, let us try to estimate how many of the seriously delinquent loans would be in each of five categories (table A.1). We make the following assumptions:

- Twenty-three percent of the loans would have moved from serious delinquency to liquidation absent forbearance, and 77 percent would have recovered. This reflects the behavior of the 2016 vintage, when forbearance was not a policy option.
- Eighty percent of these loans would have chosen forbearance if this option had been available.
- Forty-six percent of the loans that chose forbearance were "saved," and 54 percent moved to liquidation, from the results in the body of this report.
- Forty percent of the loans that would not have liquidated would have chosen forbearance if the option had been available. Missed payments are reported to the credit bureaus in the "standard forbearance," and electing forbearance does entail a sizeable cost to the borrower, as it compromises the borrower's credit score.

Our assumptions on the take-up rate in a normal environment are guesses. We do not have data, as "standard forbearance" is new.

These assumptions suggest that 8.5 percent of the loans (23 percent * 80 * 46 percent) were in the first category (i.e., selected forbearance and were saved), 30.8 percent of the loans (77 percent * 40 percent) took forbearance but did not need it, and another 10 percent took forbearance and liquidated anyway. The remaining two categories—loans that did not select forbearance and either recovered or liquidated—have no cost implications (table A.1, final column).

These figures suggest that the total costs are about 10.04 percent of the remaining principal balance of the saved loans:

Costs of loans that selected forbearance and did not liquidate * probability of loans in these categories
+ cost of loans that selected forbearance and liquidated * probability of loans in this category
divided by probability of loans that selected forbearance and were saved,

or (((1.41% * (8.5% + 30.8%) + (3.0% * 10%)) / 8.5%) = 10.04%

Thus, the total cost of avoiding liquidation on the "saved" loans, factoring in the costs of forbearance from both borrowers who took advantage of the policy and would not have liquidated in

any event, and the costs of providing forbearance to borrowers that liquidated anyway, is 10.04 percent of the loan amount. The benefit is the loss severity; historically, this has been around 42 percent. This suggests that the costs of forbearance would be about 23.9 percent (10.04 percent / 42 percent) of the total benefits.

This simple analysis considers only the benefit to the bearer of the credit risk and does not account for any of the benefits to the borrower or to the community from "saving" the loan. Once we do this, forbearance is a benefit, not a cost. In Alexandrov, Goodman, and Tozer (2022), we argue that the benefits to the community and to the borrower are about $30,000 per loan. This includes the savings to the borrower that would result from not having to find a new place and move, as well as the fact that there is no reduction in property values on other homes in the neighborhood.

These calculations are admittedly crude, but they emphasize that even if we consider the full cost of forbearance to the bearer of the credit risk, and do not give any "credit" for the savings to the borrower and the community, there is plenty of room to expand the credit box.

Notes

[1] Karan Kaul and Laurie Goodman, "Is the 2020 Toolkit for Helping Homeowners in Crisis Better Than What We Had in 2008?" *Urban Wire* (blog), Urban Institute, March 20, 2020, https://www.urban.org/urban-wire/2020-toolkit-helping-homeowners-crisis-better-what-we-had-2008

[2] Federal Housing Finance Agency, "FHFA Announces Enhanced Payment Deferral Policies for Borrowers Facing Financial Hardship," news release, March 29, 2023, https://www.fhfa.gov/Media/PublicAffairs/Pages/FHFA-Announces-Enhanced-Payment-Deferral-Policies-for-Borrowers-Facing-Financial-Hardship.aspx.

[3] "Making Home Affordable (MHA)," US Department of the Treasury, accessed April 3, 2024, https://home.treasury.gov/data/troubled-assets-relief-program/housing/mha.

[4] See also Kaul and Goodman, "Is the 2020 Toolkit for Helping Homeowners."

[5] A review of the timeline for the introduction and changes in the forbearance programs can be found in Goodman et al. (2023).

[6] We used a methodology similar to Alexandrov, Goodman, and Tozer (2022). We assume an average of six missed payments, a $250,000 average loan size, a 4 percent interest rate, tax and insurance rates of 1.75 percent, a payment postponement that averages eight years, a 23 percent transition rate from serious delinquency to liquidation, 10.6 percent less with forbearance, 80 percent for the borrowers who would have defaulted anyway elect forbearance, and 40 percent of the borrowers who otherwise would have recovered.

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