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Government and Private Household Debt Relief during COVID-19

ABSTRACT We study the suspension of household debt payments (debt forbearance) during the COVID-19 pandemic. Between March 2020 and May 2021, more than 70 million consumers with loans worth $2.3 trillion entered forbearance, missing $86 billion of their payments. This debt relief can help explain the absence of consumer defaults relative to the evolution of economic fundamentals. Borrowers' self-selection is a powerful force in determining forbearance rates: relief flows to households suffering pandemic-induced shocks that would otherwise have faced debt distress. Moreover, 55 percent of forbearance is provided to less creditworthy borrowers with above median income and higher debt balances—that is, those excluded from income-based policies, such as the stimulus check program. A fifth of borrowers in forbearance continued making full payments, suggesting that forbearance acts as a credit line. By May 2021, about 60 percent of borrowers had already exited forbearance while more financially vulnerable and lower income borrowers were still in forbearance with an accumulated debt overhang of about $60 billion. Exploiting a discontinuity in mortgage eligibility under the CARES Act, we estimate that implicit government debt relief subsidies increase the rate of forbearance by about a third. Government relief is provided through private intermediaries, with shadow banks less likely to provide forbearance than traditional banks.

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Large economic crises such as the Great Depression and Great Recession are often accompanied by significant household debt distress, which spills over to the rest of the economy (Mian and Sufi 2009; Keys and others 2013; Wachter, Duca, and Popoyan 2019). Based on historical experience, the evolution of economic fundamentals of the COVID-19 pandemic would also predict a large amount of household debt distress. This grim scenario failed to materialize, resulting in substantial "missing defaults." We study the role of private and government debt forbearance—that is, temporary suspension of debt repayments—in averting household debt distress. We find that forbearance can explain a significant part of the missing household defaults and likely significantly dampened the potential negative spillovers to the rest of the economy. Borrower self-selection and take-up played a central role in the incidence and effectiveness of the relief. Government mandates and intermediary factors also played an important role in transmission of relief. We also discuss how to unwind the debt accumulated by vulnerable households and draw broader implications for the design of debt relief policies.

We study forbearance using a representative credit bureau panel of more than 20 million US consumers. The data allow us to study which loans are in forbearance—allowing borrowers to defer loan payments—as well as the extent to which households chose to miss payments. A significant share of households, for example, request and obtain forbearance but nevertheless continue making full payments. The data also allow us to classify which loans were eligible for government debt relief under the Coronavirus Aid, Relief, and Economic Security (CARES) Act and which relief was provided by the private sector.

Over 70 million individuals obtained forbearance between March 2020 and May 2021, totaling loans worth about $2.3 trillion. The lion's share of new forbearance initiated during the COVID-19 crisis was in the categories of mortgages and student debt, accounting for $1.4 trillion and $655 billion, respectively. Forbearance actions resulted in substantial financial relief for households. The average cumulative payments missed by individuals in forbearance during this period were largest for mortgage ($4,254) and auto ($398) debt. By May 2021, debt forbearance allowed US consumers to miss about $86 billion of their payments. At this rate, forbearance would allow more than 70 million consumers to miss about $100 billion of their debt payments by the end of September 2021, when some of the key government forbearance mandates were set to expire.

The extent of forbearance may account for the missing household defaults during the pandemic. Economic fundamentals deteriorated significantly

during the pandemic, with the unemployment rate reaching almost 15 percent in 2020:Q2. The strong historical association between unemployment and mortgage default predicts a substantial increase in household debt distress (Piskorski and Seru 2018). Instead, delinquency rates declined from 3 percent to 1.8 percent. Exploiting the richness of our individual-level panel data, we measure missing defaults. We estimate the expected delinquency levels, given the evolution of the local economic conditions and the credit profile of borrowers, and compare them to actual levels that occurred during the pandemic. Our estimates suggest that the majority of predicted mortgage defaults are missing. The actual default rate averaged below 2 percent instead of a predicted 6.8 percent at its peak, amounting to about 1.5 to 2.5 million missing defaults in the aggregate. While other policies such as generous unemployment benefits certainly played a role in averting consumer distress (Cox and others 2020), a back-of-the-envelope calculation suggests that the level of forbearance is large enough to account for averted potential delinquencies in the mortgage market. Moreover, despite its much lower cost, we find that the extent of forbearance relief is much more strongly related to the extent of missing defaults in a region than other stimulus programs. We further validate this view by exploiting government mandates that generate variation in the forbearance rates among similar borrowers and show a strong association between forbearance and missing default rates. We speculate that the resultant low delinquencies can explain, at least in part, why the pandemic has not resulted in house price declines, which would have further exacerbated household debt distress.

There are at least two features that distinguish household debt forbearance from other relief programs targeted at households. First, borrowers self-select into forbearance, as well as decide whether to draw on the forbearance, which is effectively a line of credit. We show that this self-selection is an important determinant of how debt relief is allocated in the population, and forbearance provides a temporary bridge for pandemic-related liquidity shocks faced by the households. Second, the private sector plays an important role in the provision of forbearance, both as an alternative to government forbearance and as a conduit through which government forbearance is implemented.

To obtain forbearance, borrowers must request it from the lender, and in the case of private forbearance, lenders must approve such requests. Among the largest consumer debt category, residential mortgages, more than 90 percent of borrowers eligible for forbearance through the CARES Act decided not to take up the option of debt relief. This suggests that borrowers' self-selection is a powerful force in determining forbearance

rates. This self-selection resulted in relief being provided to a very different population of individuals relative to other CARES Act policies, such as stimulus checks. The rates of forbearance also decline substantially with creditworthiness but are much less progressive in income than other relief programs. Lower income households are more likely to obtain forbearance relief. Because they have lower debt balances, the dollar value of debt relief is also smaller. About 55 percent of the dollar amount of financial relief from forbearance was received by borrowers with above median prepandemic incomes. This observation highlights an important feature of forbearance: it provides relief to borrowers with higher prepandemic incomes who may become financially constrained during the pandemic but who do not qualify for income-based relief programs. Notably, such individuals can play an important role in aggregate responses due to their high marginal propensities to consume.

We provide further evidence that self-selection into forbearance also provides relief to households suffering pandemic-induced shocks who would have otherwise faced debt distress—the population that is potentially targeted by the policy. Forbearance rates are significantly higher in regions that experienced the highest COVID-19 infection rates and the greatest deterioration in their local economies, as reflected by unemployment insurance claims and the concentration of industries most exposed to the pandemic. The economic and health consequences of the pandemic have disproportionately affected minorities, especially Black Americans (Lopez, Rainie, and Budiman 2020). Consistent with this observation, regions with higher shares of minorities received debt forbearance at higher rates. We also document the highest rates of forbearance in regions where economic conditions would otherwise predict the highest default rates on household debt. These are regions where we also observe the largest gap between expected and actual defaults. Thus forbearance may have reached its intended target, especially helping households who were likely affected by the pandemic but were unlikely to be eligible for income-based programs.

The private sector provided forbearance for debt outside the federally insured mortgages and student loans mandated by the CARES Act. We find substantial increases in forbearance in auto and credit card loans, as well as mortgage loans not eligible under the CARES Act: about 20 percent of total debt relief was provided by the private sector for debt not eligible under CARES Act rules.

We compare the provision of private and public sector forbearance to measure the role of implicit forbearance subsidies provided in the government mandate. Private forbearance is presumably the result of (ex ante) a

mutually beneficial renegotiation, which allows borrowers to bridge a temporary liquidity shock. To evaluate the importance of implicit government subsidies, we exploit a size discontinuity in the eligibility of mortgages for relief under the CARES Act. While government-insured loans below the conforming loan limit qualified for government-mandated forbearance, loans above the limit were not eligible.[1] Restricting our analysis to mortgages with balances near the conforming loan balance limits, we find that the percentage of loans in forbearance increases by 1.6 percent, about a third in relative terms, for loans covered by the government mandate. This contrasts with the pattern observed outside of the pandemic, in which loans issued without government guarantees have slightly higher forbearance rates at the discontinuity. Our back-of-the-envelope estimates suggest that about 25 percent of government forbearance is subsidized and the rest is provided to borrowers who might have received debt relief from the private sector.

The estimates are likely a lower bound for various reasons. First, the government mandates might have affected private forbearance supply. This positive spillover could be generated through several channels. For example, the CARES Act sets uniform forbearance protocols and spurred a collective action response that might not have occurred so promptly otherwise. The standards set by the CARES Act might have not only provided servicers with simple rules for the private sector to follow but also imposed reputational concerns on servicers who did not supply forbearance for loans not covered by the mandates. Second, the government mandates might have affected loans not covered by the mandates through general equilibrium: the mandates avoided delinquencies and costly foreclosures and could stabilize house prices, which prevented loans collateralized by the houses and not covered by the mandates from going underwater (Anenberg and Scharlemann 2021).

We find evidence that this additional forbearance seems to decrease household distress relative to predicted levels based on economic fundamentals. A 1.6 percent higher forbearance rate during the pandemic on loans covered by mandates is associated with a 0.7 percent higher rate of missing defaults. These estimates imply that two forbearances are associated with about one missing default, the same ratio as in the aggregate data. This further validates our observation that debt forbearance can account for a substantial portion of prevented defaults during the pandemic.

1. Jumbo loans exceed the conforming loan balance limits set by the Federal Housing Finance Agency and cannot be purchased, guaranteed, or securitized by the government-sponsored enterprises (GSEs).

Government relief is explicitly provided by a variety of private servicers, more than half of whom are shadow banks (Buchak and others 2018; Jiang 2020; Jiang and others 2020). Since relief of government loans is mandated, one might expect that there would be few differences between suppliers. Instead, even accounting for borrower characteristics, we find lower rates of forbearance for loans serviced by shadow banks relative to traditional banks. This result suggests that despite the blanket (and relatively simple) government mandate, who implements forbearance has a meaningful effect on the amount of debt relief provided—a result reminiscent of debt relief during the Great Recession (Agarwal and others 2017; Agarwal and others 2020).

One of the problems faced by policymakers is that it is difficult to recognize which households need to bridge temporary liquidity shocks and which households suffer more permanent debt distress, leaving them insolvent. This is complicated by the fact that the policy intervention itself can affect the duration of the crisis. Forbearance is designed as a temporary bridge to absorb liquidity shocks faced by households—deferred payments need to be repaid. In fact, we document that more than 20 percent of households obtain forbearance but nevertheless continue making full payments. These are households who behaved as if forbearance were a line of credit that they could draw on in need, but who realized ex post that they did not need to access it. On the other end of the spectrum are borrowers who are insolvent and who will not be able to exit forbearance without significant loan modification. An important policy question is therefore how forbearance will be unwound after it expires; government mandates issued during the pandemic were to expire on September 30, 2021.

We first document that a substantial share of borrowers who entered forbearance did so to bridge temporary shocks, but we also document a substantial amount of forbearance overhang of postponed payments for a significant share of borrowers. About 60 percent of borrowers had already exited forbearance as of May 2021 (about 75 percent of mortgage borrowers). Most of these borrowers used forbearance as a temporary liquidity facility—either not drawing down on payments (a third) or repaying missed payments within two months of entering forbearance (about 20 percent). On the other hand, a significant proportion of borrowers (about 7 percent) who exited forbearance did so with a loan modification, suggesting that their distress was not temporary.

In addition, at the time of writing a substantial share of borrowers had not yet exited forbearance: as of May 2021 more than 40 percent of 72 million Americans who entered forbearance during the pandemic were still missing

about $60 billion on their debt repayments.[2] At this rate, by September 2021 when forbearance mandates are set to expire, we estimate that these borrowers with persistent periods of forbearance will be left with a forbearance overhang of more than $70 billion in accumulated postponed repayments. This estimated overhang amounts to about $3,900 per individual, which is about 1.5 times their average monthly income and more than 2.2 times for lower income borrowers. For mortgage borrowers, the largest debt category, the estimated overhang is about $15 billion, amounting to about $14,200 per individual on average, which is about 3.4 times their average monthly income. Moreover, as discussed above, these borrowers with long periods of forbearance are more likely to be in regions with lower income, higher unemployment, and higher minority share.

A significant share of these low-income borrowers will likely become distressed if accumulated payments are structured as a onetime payment due immediately after forbearance ends, even if this payment is anticipated. Most mortgages in forbearance, including the ones held by the most vulnerable borrowers, are insured through the government-backed programs, allowing wide latitude in implementation. Adding missed payments to the loan balance would spread out the repayment of payments in forbearance over a long period of time (about 25 years), increasing existing payments by about $90–120 per month. In addition, the government could consider a refinancing program that would allow borrowers in forbearance to easily refinance their loans while increasing the loan balance of the new loan by the accumulated amount of missed payments in forbearance. Such a program could be part of a broader refinancing initiative (Golding and others 2020). Since borrowers in forbearance face mortgage rates considerably higher than the current rates (in excess of 4 percent on legacy loans), refinancing could lower the overall mortgage payment burden of borrowers. The upfront versus deferred repayments could have significantly different consequences for consumers and for the aggregate economy (Eberly and Krishnamurthy 2014; Mian and Sufi 2014b; Piskorski and Seru 2018; Ganong and Noel 2020).

We conclude by drawing broader implications for debt relief policies. One possible reason for the quick implementation of debt relief actions during COVID-19 is that the private sector and policymakers may have internalized the lessons from the Great Recession pointing to significant

2. Borrowers who entered forbearance March–October 2020 missed about $43.5 billion of their debt payments. Accounting for debt repayments already made by October 2020, the net amount is $38 billion.

costs of widespread defaults and foreclosures and were more willing to provide widespread and quick debt relief (Eberly and Krishnamurthy 2014; Campbell, Clara, and Cocco 2020; Piskorski and Seru 2018). The large private response suggests that a substantial amount of debt forbearance was mutually beneficial. Another alternative reason for such behavior could be that the COVID-19 shock was perceived as more transitory relative to prior crises, which could have promoted a more widespread deployment of temporary debt relief measures by the private sector. This is consistent with the consumer debt design literature, which indicates that lenders should provide a certain amount of debt relief during economic downturns to limit deadweight costs of default and allow better risk-sharing between borrowers and lenders, especially if the underlying shocks are transitory (Piskorski and Tchistyi 2010, 2011, 2017; Eberly and Krishnamurthy 2014; Greenwald, Landvoigt, and Van Nieuwerburgh 2017; Guren, Krishnamurthy, and McQuade 2021; Campbell, Clara, and Cocco 2020; Ganong and Noel 2020). Relatedly, the COVID-19 shock is a textbook example of a rare aggregate exogenous shock that is largely outside of agents' influence. This should alleviate concerns about the moral hazard effects of debt relief on incentives to repay debt leading to more widespread loan renegotiation efforts during such times (Piskorski and Tchistyi 2010, 2011, 2017; Mayer and others 2014).

We note that our results also suggest that allowing borrowers a choice of whether to request debt relief, as in the case of mortgages, might have resulted in a potentially better targeted debt relief policy as compared to blanket automatic forbearance policies like the one used in the case of student debt. However, policies employing such self-selection can still expose borrowers to intermediary related implementation frictions. As we show these frictions were still present during the pandemic despite the significantly simpler design of debt relief policies relative to those used in the Great Recession. This suggests that future debt relief policies leaning on borrower self-selection for better targeting may also need to account for possible intermediary frictions. Finally, because most of the forbearance amounts will likely be repaid, unlike other stimulus measures forbearance implies substantially smaller net transfers to agents. Yet despite their much lower cost to taxpayers, the targeting of temporary relief at households in distress (through self-selection) prevented substantial household distress and with it likely the spillover to the rest of the economy.

Our paper is related to the literature on the role of the household balance sheet channel in the transmission of economic shocks (Mian and Sufi 2009,

2011, 2014a; Guerrieri and Uhlig 2016; Hurst and others 2016; Agarwal and others 2017, 2018, 2020; Berger and others 2018, 2021; Benmelech, Meisenzahl, and Ramcharan 2017; Kaplan, Mitman, and Violante 2020; Favilukis, Ludvigson, and Van Nieuwerburgh 2017; Di Maggio and others 2017; Di Maggio, Kermani, and Palmer 2020; Greenwald 2016; Guren and others 2018; Auclert 2019; Beraja and others 2019; Eichenbaum, Rebelo, and Wong 2019; Andersen and others 2020). Within this literature our paper contributes to the recent studies that analyze the effects of various stabilization programs operating through the household balance sheet channel (Mian and Sufi 2012; Parker and others 2013; Hsu, Matsa, and Melzer 2018; Berger, Turner, and Zwick 2020) and especially studies focusing on various forms of debt relief (Piskorski, Seru, and Vig 2010; Agarwal and others 2011, 2017, 2020; Mayer and others 2014; Scharfstein and Sunderam 2016; Di Maggio and others 2017; Di Maggio, Kermani, and Palmer 2020; Maturana 2017; Fuster and Willen 2017; Kruger 2018; Piskorski and Seru 2018, 2021; Auclert, Dobbie, and Goldsmith-Pinkham 2019; Mueller and Yannelis 2019b; Ganong and Noel 2020). It is also related to literature on effects and policy response to the pandemic (Baker and others 2020; Chetty and others 2020; Coibon, Gorodnichenko, and Weber 2020; Cox and others 2020; Elenev, Landvoigt, and Van Nieuwerburgh 2020; Granja and others 2020; Guerrieri and others 2020; Fuster and others 2021).

I. Institutional Setting: US Consumer Debt Market, Debt Forbearance, and the CARES Act

A forbearance agreement includes a halt or reduction in a borrower's loan payments for a fixed period. To enter a forbearance agreement the borrower must usually approach the lender with satisfactory proof of distress and proof that the distress is temporary. If the lender chooses to extend forbearance, the borrower may stop or decrease their loan payments without fear of foreclosure, or they can keep making contractual payments. Although the payments have been delayed, the loan's interest does not stop accruing over this period. Forbearance is not a debt forgiveness program or a loan modification. The borrower is required to pay the lender the missed payments after the forbearance period ends. Typical repayment plans following the end of the forbearance period consist of a lump sum payment or increasing the regular payment amounts once forbearance is finished. Borrowers can also attempt to obtain a loan modification agreement that allows them further deferral or permanent reduction of at least part of their missed payments.

The CARES Act signed on March 27, 2020, included several loan forbearance provisions.[3] Below, we discuss typical structures and standards for loan forbearance in each of the loan segments and the implications of the CARES Act for them. We focus on the four main categories of consumer debt: residential mortgages, auto, revolving, and student debt. Figure A1 in the online appendix shows the evolution of the aggregate outstanding loan balance for these four types of debt from 2006 to 2021.

I.A. Residential Mortgage Market

The residential mortgage market is by far the largest form of consumer debt in the United States. As of 2020, total mortgage balances in the United States totaled about $10 trillion. Roughly two-thirds of outstanding mortgages are effectively guaranteed by the US government (Buchak and others 2018) comprising conforming loans sold to government-sponsored enterprises (GSEs) and the Federal Housing Administration (FHA) loans. Conforming loans are typically extended to borrowers with relatively high credit scores, fully documented income and assets, and moderate loan-to-value ratios. The FHA provides mortgage insurance on loans made by FHA-approved lenders nationwide, which is usually considered the riskiest segment of the mortgage market as they mainly appeal to lower income and less creditworthy households. GSE and FHA loans are subject to origination loan balance limits.[4] Jumbo loans with balances exceeding the conforming loan limit account for about 15 percent of the outstanding loan balances in our data. These loans are ineligible for government guarantees and are therefore much more difficult to securitize and are typically retained on lender balance sheets (Buchak and others 2020).

Mortgage forbearance agreements have been historically granted on a case-by-case basis (Corcoran and Haltom 2020). Proof of distress, proof that the distress is temporary, and proof that the borrower can repay the interest and missed payments has been typically required when granting forbearance. Under the CARES Act, borrowers with federally backed mortgages, including GSE, FHA, and Veterans Administration loans, were allowed to pause their mortgage payments with no penalties until

3. US Department of the Treasury, "Covid-19 Economic Relief," https://home.treasury.gov/policy-issues/coronavirus.

4. For conforming loans, these limits were $417,000 for a single-family home in most regions and $625,000 in some regions depending on the area's cost of living throughout most of the last decade, reaching $510,400 and $765,600, respectively, by 2020 after their progressive increases during the 2017–2020 period.

September 2021. Under forbearance policies, no fees, penalties, or additional interest may be added to a borrower's account. In addition, the CARES Act granted mortgage borrowers protections to help them avoid foreclosure, including a sixty-day foreclosure and eviction moratorium for borrowers with federally backed mortgages. This moratorium was originally intended to expire in May 2020 but was subsequently extended several times.[5] Borrowers with loans without the government guarantees, such as jumbo loans, were not covered by the CARES Act forbearance mandates, in which case forbearance had to be approved by the lender.[6]

It is important to note that while the CARES Act guaranteed individuals with federally backed mortgages the right to pause their mortgage payments, it did not automatically place their mortgages in forbearance. Borrowers were required to contact their loan servicer to put their payments on hold, though the forbearance process was straightforward—borrowers simply needed to claim they had a pandemic-related hardship and did not need to submit any documentation.

I.B. Student Debt

In 2006, student loan debt was the smallest of the four consumer debt categories, but by 2020 total student loan balances were exceeded only by mortgages (online appendix figure A1). The federal government is the primary provider of student loans in the United States, with about 90 percent of outstanding student loans held by the Department of Education (Looney and Yannelis 2019). Obtaining federal student loan forbearance has historically been relatively easy. For example, federal student loan borrowers may be entitled to a loan deferment if they are unemployed or a forbearance if the amount owed exceeds 20 percent of their gross income (Mueller and Yannelis 2019a).

The CARES Act automatically placed federal student loans into administrative forbearance and set their interest rate to 0 percent. Student loan forbearance was originally designed to expire in September 2020 but has been extended several times. Borrowers with private student loans are not covered under the CARES Act, so forbearance had to be approved by the lender in those cases.

5. For a discussion of the mortgage foreclosure moratorium, see Capponi, Jia, and Rios (2020).

6. The act prevents the reporting of delinquency to credit bureaus on all loans if the borrower is current on their account and their lender agrees to allow a skipped payment, partial payment, or other accommodation due to the pandemic.

I.C. Auto and Revolving Debt

Auto debt has increased faster than all other types of debt except for student loans over the past ten years, totaling over $1.3 trillion in 2020. The majority of both new and used cars are financed with debt—in 2018, over 85 percent of new cars and 55 percent of used cars were financed with a loan or a lease (Di Maggio and others 2017). Revolving debt refers to all accounts that allow individuals to borrow against a credit line, except for home equity lines of credit. This includes credit cards as well as retail and other revolving accounts like personal lines of credit (Agarwal and others 2018). Total outstanding revolving debt was slightly over $1 trillion as of 2020 (online appendix figure A1). Unlike the mortgage and student loan markets, the CARES Act did not include any explicit forbearance mandates for auto or revolving loans. Borrowers contacted their lenders for information about forbearance or deferment policies for these types of debt, with policies and eligibility varying by lender.

II. Data Sources

II.A. Equifax Analytic Dataset

Our main data set is the Analytic Dataset provided by Equifax. Equifax is a credit-reporting agency that provides monthly borrower-level data on credit risk scores, consumer age, geography, debt balances, and delinquency status at the loan level for all consumer loan obligations and asset classes. The Analytic Dataset is created from a 10 percent random sample of the US credit population from 2005 to 2021 across the United States and consists of over 20 million consumers (table 1). Randomization in the sample is based on Social Security numbers, ensuring that the sample is representative of the US credit population. We use these data to investigate consumer forbearance status, delinquency status, payment history, age, income, credit score, and location.

We follow Equifax's standard procedure for identifying whether a loan is in forbearance. Specifically, we consider a loan to be in forbearance if it has a narrative code indicating that it is in forbearance or deferment, if it is in a partial payment plan, if the loan has been modified, or if the account has a positive balance with no reported scheduled payment. We exclude all loans that have been refinanced or prepaid. To validate the forbearance measure, we compare a subset of the Equifax sample labeled as GSE loans to loans in the Fannie Mae Single-Family Historical Loan Performance Dataset, which we describe in detail below. The samples are comparable in

Table 1. Individual-Level Descriptive Statistics

	All individuals				*All individuals in forbearance*			
	Pre-COVID-19		*COVID-19*		*Pre-COVID-19*		*COVID-19*	
	(1) *Mean*	*(2)* *SD*	*(3)* *Mean*	*(4)* *SD*	*(5)* *Mean*	*(6)* *SD*	*(7)* *Mean*	*(8)* *SD*
Vantage	701	122	711	119	645	122	670	112
Estimated age	49	18	49	18	41	17	40	16
Estimated income	39,992	19,272	40,134	19,426	34,063	19,250	33,940	18,562
Fraction with first mortgage	0.22		0.22		0.18		0.21	
Fraction with auto debt	0.35		0.35		0.38		0.40	
Fraction with revolving debt	0.89		0.93		0.78		0.74	
Fraction with student debt	0.18		0.17		0.56		0.64	
Average first mortgage balance (nonzero accounts)	210,020	240,631	216,969	248,378	232,542	284,857	236,257	266,933
Average combined mortgage balance (nonzero accounts)	204,346	239,936	218,478	247,674	224,272	283,478	229,115	266,321
Average auto debt (nonzero accounts)	18,474	17,496	19,605	17,898	19,897	20,567	20,173	19,715
Average revolving debt (nonzero accounts)	5,047	9,178	6,077	10,109	7,369	12,370	6,482	11,389
Average student debt (nonzero accounts)	35,149	51,510	36,198	52,449	39,234	54,999	37,716	53,975
Average credit card utilization (%)	32		27		49		42	
Average available credit	17,512	23,338	17,776	23,488	14,993	25,582	15,252	24,692
Number of consumers	20,265,012		21,200,723		3,702,943		9,338,267	

Source: Equifax.

Note: This table shows summary statistics for all individuals in the Equifax data set (columns 1 through 4) and all individuals in forbearance (columns 5 through 8). Pre-COVID-19 statistics are based on January and February 2020, while COVID-19 statistics are based on March 2020 to May 2021. The data from Equifax comprise a 10 percent representative sample of the US credit population.

terms of borrower and loan characteristics (online appendix table A1) as well as forbearance rates (online appendix figure A2). If anything, we underestimate the amount of forbearance using Equifax data.

II.B. Fannie Mae Single-Family Historical Loan Performance Dataset

We obtain all loans that were acquired by Fannie Mae since January 1, 2000, and the monthly performance through October 2020. We restrict our sample to active loans, which had not been paid off, refinanced, or foreclosed by January 2020. These loan-level monthly panel data provide detailed information on a rich set of loan and borrower characteristics (e.g., FICO scores, loan-to-value, debt-to-income, location of the property, and interest rates), property, and monthly payment history. Two sets of information are important to supply our forbearance analysis.

First, we can determine if a seller or servicer is a bank or a shadow bank by merging the Fannie Mae data set to bank regulatory filings (e.g., Forms 031 and FY-9C) and shadow bank call reports (Jiang and others 2020) for entities that represent at least 1 percent of volume within a given acquisition or reporting quarter. Second, Fannie Mae collects information about the type of assistance plan that the borrower is enrolled in that "provides temporary mortgage payment relief or an opportunity for the borrower to cure a mortgage delinquency over a defined period," in which Forbearance Plan, Repayment Plan, and Trial Period Plan are the three major borrower assistance plan categories.[7]

II.C. Other Data Sources

The Opportunity Insights Tracker provides real-time data on total COVID-19 case rates, total unemployment insurance claims, changes in credit/debit card spending, and changes in time spent at workplaces at the county level.[8] We use the data to understand how local economic conditions and regional impacts of the COVID-19 crisis relate to forbearance actions. We supplement the regional Opportunity Insights Tracker with socioeconomic characteristics from the US Census Bureau's American Community Survey 2018 five-year estimates at the zip code tabulation area level.[9] We use median house prices from Zillow, unemployment claims and benefits

7. Fannie Mae, Single-Family Loan Performance Dataset and Credit Risk Transfer—Glossary and File Layout, https://capitalmarkets.fanniemae.com/media/6931/display, p. 8.

8. Opportunity Insights, "Economic Tracker," https://opportunityinsights.org/tracker-resources/.

9. US Census Bureau, "American Community Survey Data," https://www.census.gov/programs-surveys/acs/data.html.

from the Department of Labor, the number and amount of economic impact payments (stimulus checks) received by each state from the Internal Revenue Service, and the number and size of Paycheck Protection Plan loans from the Small Business Administration.[10] We also gather information on the number of small businesses in a county and the share of the workforce employed in certain industries from the Bureau of Labor Statistics.[11]

III. Aggregate Household Debt Forbearance and the Absence of Distress during COVID-19

III.A. Aggregate Forbearance Rates, Usage, and Amount of Relief

We begin by analyzing forbearance rates on residential mortgages, the largest category of US consumer debt. Residential mortgage forbearance rates increased from roughly 0.6 percent prior to the COVID-19 pandemic to nearly 7 percent in June following the declaration of the national COVID-19 emergency and the implementation of the CARES Act in March 2020 (figure 1, panel B). Overall, about 9.45 percent of mortgage borrowers were in forbearance during the period from March 2020 to May 2021, of which about 90 percent entered forbearance during the COVID-19 period (table 2, panel A). Forbearance rates during the COVID-19 period were also much larger than those during the Great Recession, when forbearance rates peaked at a little over 2 percent.

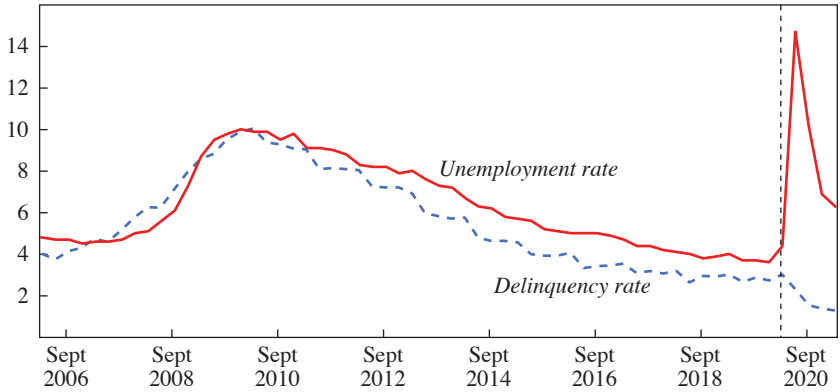
Figure 2 shows delinquency and forbearance rates of different debt types from January 2019 to May 2021. Auto and revolving debt exhibited low forbearance rates prior to the pandemic, with large spikes occurring around April 2020. Student loans are the exception, with large numbers of loans in forbearance or deferment prior to the pandemic (about 50 percent). Nevertheless, the percentage of student loans in forbearance or deferment jumps from 50 percent to well over 90 percent in April 2020. Since June 2020, forbearance rates have declined for all debt types except for student loans, which were placed in automatic forbearance, but they remain elevated well above their historical averages.

10. Zillow, "United States Home Values," https://www.zillow.com/research/data/; US Department of Labor, "Monthly Program and Financial Data," https://oui.doleta.gov/unemploy/claimssum.asp; Internal Revenue Service, "SOI Tax Stats—Coronavirus Aid, Relief, and Economic Security Act (CARES Act) Statistics," https://www.irs.gov/statistics/soi-tax-stats-coronavirus-aid-relief-and-economic-security-act-cares-act-statistics#EIP3; US Small Business Administration, "PPP Data," https://www.sba.gov/funding-programs/loans/covid-19-relief-options/paycheck-protection-program/ppp-data.

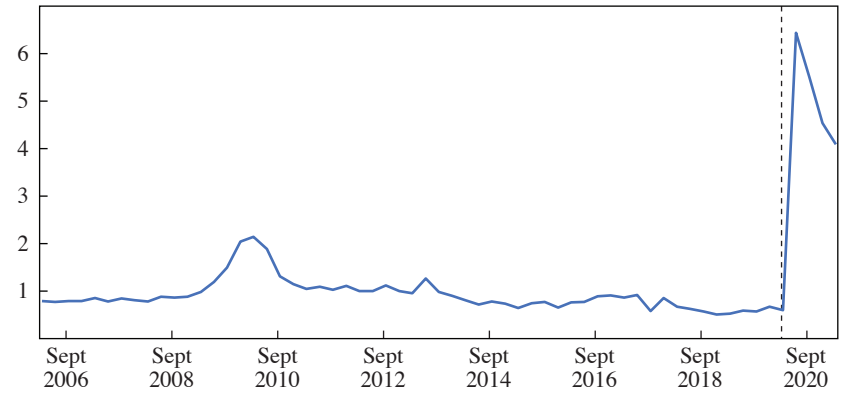
11. US Bureau of Labor Statistics, "County Business Patterns: 2019," https://www.census.gov/data/datasets/2019/econ/cbp/2019-cbp.html.

Figure 1. Residential Mortgage Debt: Delinquency and Forbearance Rates

Panel A: Delinquency and unemployment rate



Panel B: Forbearance rate and the COVID-19 crisis



Sources: Equifax; US Bureau of Labor Statistics.

Note: Panel A shows the US residential mortgage delinquency rate along with the US unemployment rate over the time period from Q2:2006 to Q1:2021. Panel B shows the corresponding mortgage forbearance rates. Delinquency rates are thirty days past due or worse. The dashed vertical line shows the declaration of national emergency due to COVID-19 and the passage of the CARES Act. Forbearance rates are calculated according to Equifax's standard procedure for identifying loans in forbearance. The quarterly unemployment rates are peak values in a respective quarter. The data from Equifax comprise a 10 percent representative sample of the US credit population.

Table 2. Consumer Debt Forbearance during COVID-19

Panel A: Mean delinquency and debt forbearance rates during the COVID-19 period

	Mortgages	*Auto loans*	*Revolving loans*	*Student loans*
Monthly delinquency rate (%)	1.52	2.92	1.84	0.78
Monthly forbearance rate (%)	4.34	2.32	2.38	85.21
Missing payments/in forbearance (%)	74.50	77.05	81.39	96.22
Scheduled payment missed/ in forbearance (%)	63.99	63.91	83.07	92.47
Monthly amount missed per individual/in forbearance ($)	$1,084.7 [$3,008.70]	$253 [$324]	$32.84 [$114.30]	$28.96 [$93.09]
Ever in forbearance (%)	9.45	10.50	4.63	93.03
Entered forbearance (%)	8.07	7.70	10.19	34.22
Cumulative amount missed per individual/in forbearance ($)	$4,254 [$14,604]	$398 [$820]	$60.7 [$428.6]	$312 [$1,094]

Panel B: Aggregate debt forbearance statistics

	Mortgages	*Auto debt*	*Revolving debt*	*Student debt*
Loan balance in forbearance (%)	8.89	7.60	9.34	44.5
Amount of loans in forbearance ($ billion)	1,400	198	125	655
Number of loans in forbearance (million)	6.3	11	62	68
Missed in forbearance (average per month) ($ billion)	2.6	0.331	0.392	3.7
Missed in forbearance (March–May 2021) ($ billion)	31	5.7	4.7	45

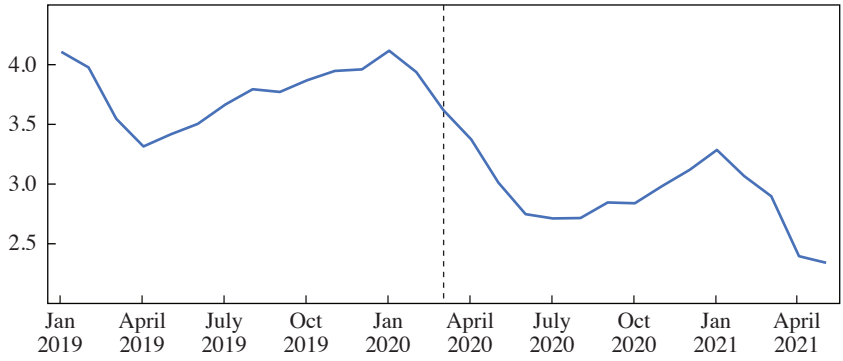
	All debt types
Number of loans that entered forbearance (million)	147
Number of individuals who entered forbearance (million)	72

Source: Equifax.

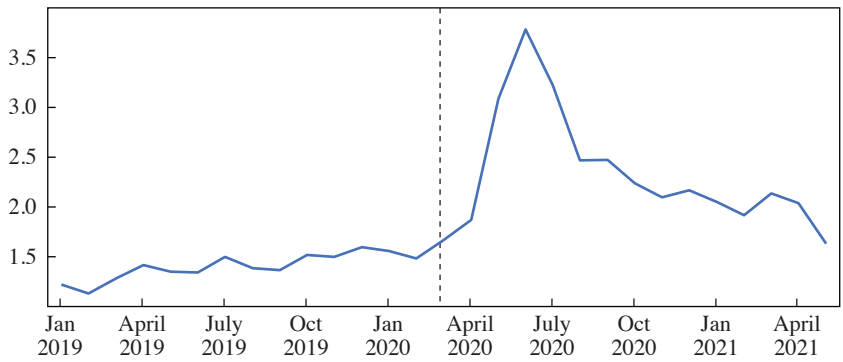
Note: Panel A shows summary statistics related to forbearance for different debt types during the COVID-19 period (March 2020 through May 2021). Standard deviations shown in brackets. Panel B provides aggregate statistics on loans that entered forbearance during the COVID-19 period. The data from Equifax comprise a 10 percent representative sample of the US credit population.

Figure 2. Auto, Revolving, and Student Debt: Delinquency and Forbearance Rates

Panel A: Auto debt delinquency rate



Panel B: Auto debt forbearance rate



Panel C: Revolving debt delinquency rate

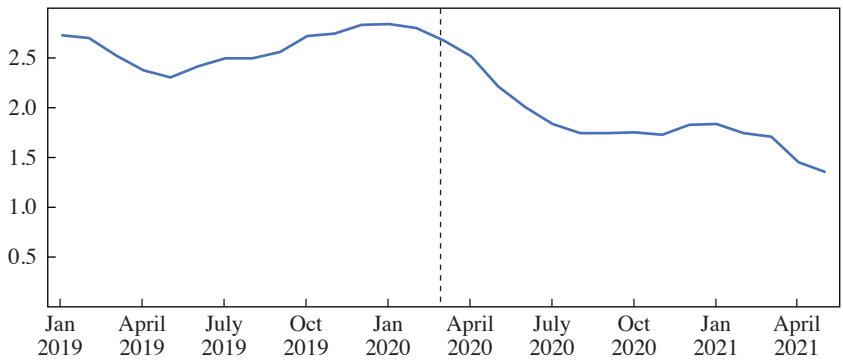
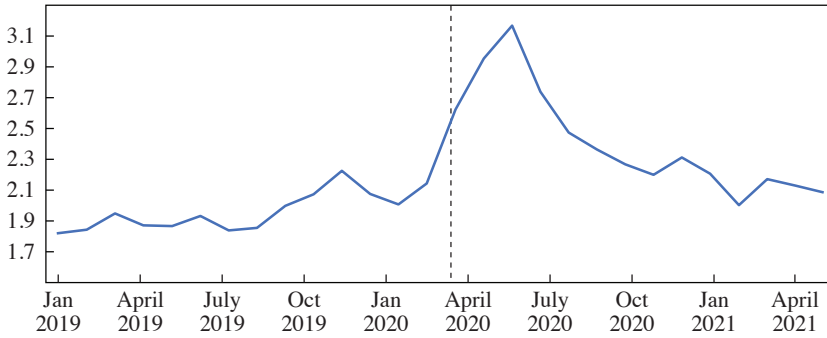
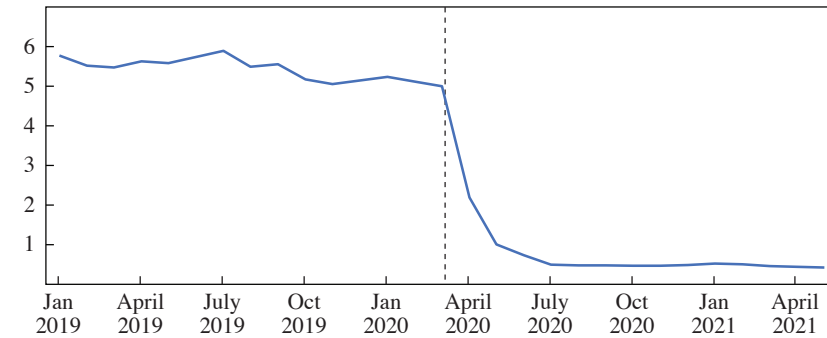


Figure 2. Auto, Revolving, and Student Debt: Delinquency and Forbearance Rates (*Continued*)

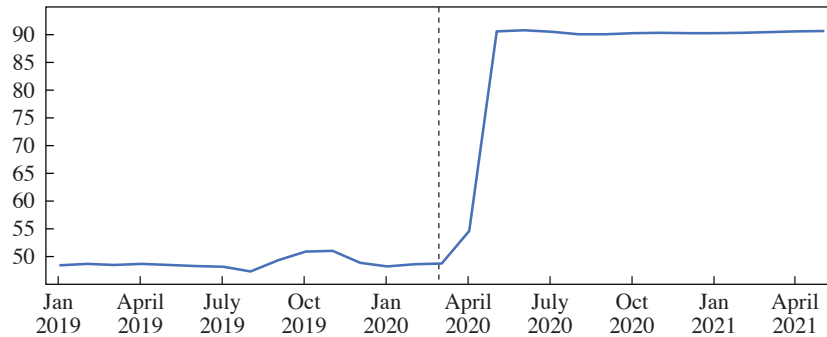
Panel D: Revolving debt forbearance rate



Panel E: Student debt delinquency rate



Panel F: Student debt forbearance rate



Source: Equifax.

Note: Delinquency rates are thirty days past due or worse. The dashed vertical line shows the declaration of the national emergency and the passage of the CARES Act in March 2020. The data from Equifax comprise a 10 percent representative sample of the US credit population.

Forbearance gives borrowers an option to stop loan payments. About 75 percent of borrowers in the case of mortgages to more than 96 percent in the case of student debt missed their scheduled payments (table 2, panel A). On the other hand, a sizable minority of borrowers in forbearance continued to make full payments on their mortgage, auto, and revolving loans. Therefore, forbearance partially acts as a credit line, allowing borrowers to draw on forbearance if needed.

Individuals in forbearance obtain substantial debt relief. Mortgage debt was the category with the largest missed payments from individuals in forbearance, with the average borrower missing about $4,254 from March 2020 until May 2021. This mainly reflects the fact that mortgage balances are much higher relative to other debt balances. Auto borrowers missed on average about $398 during the same period, while revolving debt and student debt averaged, respectively $60.70 and $312 over this period. Debt relief is therefore substantial even considering other COVID-19 relief programs. The average recipient of a stimulus check received $1,696; the average unemployment benefits going to an unemployed worker from mid-March to the end of May 2021 ranged from around $16,000 to $32,000.[12] Therefore, payments missed through mortgage debt forbearance were larger than stimulus checks on average and amounted to as much as 20 percent of the total unemployment benefits received for some individuals during the pandemic. As we discuss below, debt relief affected a substantially different population than income-based programs, such as stimulus checks.

The substantial number of individuals who used forbearance to miss their payments means that forbearance is associated with a significant amount of debt relief at the aggregate level. Our data set is a random sample of the entire US credit population, so we can scale our estimates to the aggregate level without concerns about sample representativeness (table 2, panel B). From March 2020 to May 2021, $2.37 trillion of debt entered forbearance, with most of the increase coming from mortgages ($1.4 trillion). This increase reflected 147 million loans, and 72 million borrowers, suggesting that borrowers experienced debt relief in more than one category. By May 2021, borrowers missed an overall $86.4 billion of loan payments. At this rate, forbearance would allow more than 70 million consumers to miss about $100 billion of their debt payments by the end of September 2021, when some of the key government forbearance mandates were set to expire.

12. Our calculations assume that an individual was unemployed from mid-March to the end of May 2021. We calculate these numbers by taking the average unemployment benefits in each state and adding $600 per week for the weeks from March 29 through July 25.

The $100 billion aggregate amount of debt relief was somewhat smaller than other stimulus measures and may result in significantly lower cost. About $267 billion was spent on stimulus checks, $659 billion was provided through PPP loans, and an estimated $585 billion was spent on unemployment benefits.[13] Importantly, because loans in forbearance need to be in principle repaid, the final net transfers to borrowers due to forbearance are substantially lower than temporarily missed payments. As we argue in the next section, despite a much lower cost, the targeting of temporary relief at households in distress prevented substantial household distress, and with it likely the spillover to the rest of the economy.

III.B. Aggregate Implications: The Absence of Household Debt Distress

Large economic crises such as the Great Depression and Great Recession are often accompanied by significant household debt distress, which spills over to the rest of the economy. During the Great Recession, serious delinquency rates (sixty days or more) rose from less than 2 percent in 2006 to more than 8 percent in 2010 (Piskorski and Seru 2018). Federal government programs were put in place after a significant amount of household distress had already materialized (Piskorski and Seru 2021). A large body of work shows how distressed household debt distress spilled over into aggregate house prices, employment, and consumption (e.g., Mian and Sufi 2009, 2011, 2014a). In other words, the household debt channel had significant consequences in prior economic crises.

The pandemic had a devastating effect on the real economy with the unemployment rate reaching almost 15 percent by April 2020 and a severe decline in GDP (see figure 1). Extrapolating from the strong historical association between the unemployment rate, house price changes, borrower indebtedness, and mortgage defaults, one would expect a significant rise in household debt distress during the pandemic. We measure the expected amount of mortgage delinquency using Equifax individual loan performance data from 2006 to 2017:

$$\begin{aligned} Delinquent_{ikt} = {} & \beta_0 + \beta_1 UE_{kt} + \beta_2 \Delta HP_{kt} + \Gamma_1 X_{ikt} + \Gamma_2 \left(UE_{kt} \times X_{ikt} \right) \\ & + \Gamma_3 \left(\Delta HP_{kt} \times X_{ikt} \right) + \epsilon_{ikt} \end{aligned} \tag{1}$$

13. US Department of Labor, "Monthly Program and Financial Data," https://oui.doleta.gov/unemploy/claimssum.asp.

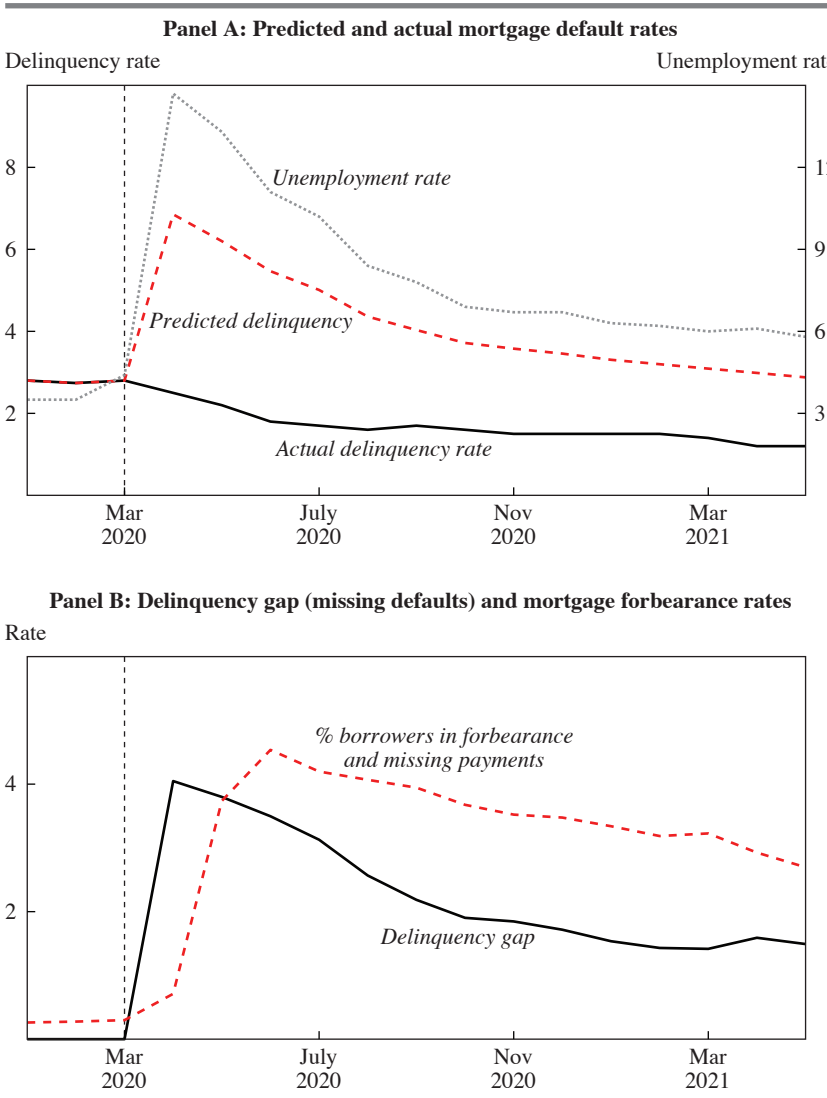
$Delinquent_{ikt}$ is an indicator for whether a mortgage loan i is thirty or more days delinquent in month t. The value UE_{kt} is the state-level unemployment rate assigned to borrower i's zip code k in month t. The values ΔHP_{kt} are the changes in house price in borrower i's zip code k in month t. The value X_{ikt} is a set of borrower and loan characteristics, including credit score, loan-to-value ratio, debt-to-income ratio, and their squared terms, which measure borrower indebtedness (home equity). Individual-level data allow us to account for changes in the composition of borrowers and their risk profile over time as well as changes in regional economic condition. The model shows a strong association of mortgage default with unemployment and changes in house prices interacted with borrower indebtedness and performs well in matching the historical aggregate delinquency rate patterns (online appendix figure A4).

The expected delinquency rate from the model would have reached the peak rate of 6.85 percent in April 2020, gradually decreasing in the following quarters but staying above 3 percent throughout the pandemic (figure 3, panel A). Instead, the *actual* mortgage delinquency rates declined during the pandemic and have remained low and steady and below 2 percent since May 2020. We call the difference between the expected (counterfactual) and realized delinquency the *delinquency gap* or *missing default rate.* The delinquency gap has averaged 3 percentage points from April 2020 to May 2021, with the highest gap of about 4.5 percentage points at the beginning of the pandemic. This delinquency gap implies about 1.5 to 2.5 million (at its peak) missing borrower defaults during the pandemic. Since defaults and foreclosures lower house prices (Campbell, Giglio, and Pathak 2011; Mian, Sufi, and Trebbi 2015; Gupta 2019), we speculate that missing defaults explain, at least in part, why the pandemic has not resulted in significant house price declines, which would have resulted in additional delinquencies, increasing the gap.[14]

The timing and level of forbearance suggest that the extent of forbearance was large enough to generate the delinquency gap. On average, for every ten missing delinquencies there are twenty mortgage borrowers in forbearance, of which about fourteen miss payments. This suggests that some borrowers may be using forbearance, even though historical data would suggest they would not default. This may reflect the fact that forbearance does not carry the usual potential costs of missing payments (e.g., lowering credit scores and risk of foreclosure). Alternatively, they may be

14. See Melzer (2017) and Diamond, Guran, and Tan (2020) for evidence regarding other effects of foreclosures.

Figure 3. Counterfactual Mortgage Defaults, Actual Defaults, and Forbearance Rates



Source: Equifax; US Bureau of Labor Statistics.

Note: Panel A compares the model-predicted mortgage delinquency rate and the actual delinquency rate along with the unemployment rate. The model is estimated using monthly loan-level data from 2006 to 2017. The dashed vertical line shows the declaration of national emergency due to COVID-19 and the passage of the CARES Act. Forbearance and missed payment rates are calculated according to Equifax's standard procedure for identifying loans in forbearance. Panel B shows the delinquency gap (prevented defaults rate), the difference between predicted mortgage delinquency rate and the actual delinquency rate and the percentage of borrowers who are in mortgage forbearance and who miss making mortgage payments. The quarterly unemployment rates are peak values in a respective quarter. The data from Equifax comprise a 10 percent representative sample of the US credit population.

using forbearance to increase their consumption during the pandemic. The pattern of forbearance over time closely matches the pattern of missing delinquencies (figure 3, panel B). The response to the pandemic differs from the Great Recession in its rapid and intensive surge in private and government debt relief. The relief materialized within weeks of the pandemic, before household distress could be fully realized (online appendix figure A3). These results suggest that debt relief has helped avoid a significant amount of household debt distress, potentially explaining why the standard household debt channel was largely absent during the COVID-19 pandemic. We validate this view in subsequent sections.

IV. Who Are the Recipients of Forbearance?

Debt forbearance has provided significant financial relief to US households throughout the initial stage of the pandemic. Ultimately, the impact of a given policy and its cost-effectiveness crucially depend on whether relief flows to those affected by shocks and in need of relief.

IV.A. Debt Forbearance across Creditworthiness and Income

We document that forbearance policies provided relief to borrowers who are less creditworthy and more likely to be liquidity constrained, even if they have higher income and are ineligible for other income-based relief programs. This take-up of debt relief may explain why forbearance has such a large impact on household distress despite a smaller aggregate expenditure than other programs.

Table 1 shows that borrowers in forbearance are more likely to be less creditworthy, have lower income, and are younger. The average Vantage credit scores are nearly 60 points lower for individuals in forbearance compared to the overall population. Borrowers in forbearance have higher average balances on all debt types, have lower average estimated annual incomes by about $6,000, and are younger by about nine years. These differences were not caused by the impact of the COVID-19 pandemic but are also present when we look at these differences in January 2020. We replicate these patterns specifically for mortgage borrowers in table A2 in the online appendix. Mortgage borrowers in forbearance were also much more likely to be delinquent on all debt types—they were over two times as likely to be delinquent on other loans, consistent with these borrowers facing credit constraints.

Forbearance rates decline in individuals' creditworthiness, income, and age (online appendix figure A6). For income and age, we create four groups

based on the 25th, 50th, and 75th percentiles of these variables. For credit scores, we simply use the four credit groups ("Low," "Fair," "Good," and "Excellent") defined by Equifax based on VantageScore. The impact of credit score is especially striking. An individual with a low credit score is more than four times more likely to be in mortgage forbearance than an individual with an excellent score. We show a decrease in forbearance across credit scores for all loan categories. The incidence of forbearance also decreases with income. The differences in forbearance are smallest for student loans, likely because all federally held student loans were automatically placed into forbearance by the CARES Act, which resulted in less-targeted, blanket financial relief across household characteristics.

Households can choose whether to miss payments upon obtaining forbearance. We find a small decline in the probability of borrowers choosing to miss payments across income, creditworthiness, and age (online appendix figure A7). These results suggest that borrower differences in creditworthiness predict whether they want to obtain the forbearance credit line and, to a much smaller extent, who chooses to use it.

Online appendix figure A8 shows that conditional on being in forbearance, the dollar amount of relief per borrower is much higher for higher-income borrowers in mortgage, auto, and student loans. For mortgages, for example, individuals in the highest income group missed over $1,000 more than individuals in the lowest income group. This is mainly because higher-income borrowers have higher loan balances and hence higher associated loan payments. The exception is the smallest debt category of revolving debt where high-income borrowers receive smaller amounts of relief. Overall, higher-income individuals are less likely to obtain relief, are similarly likely to draw on it, and once they do choose to miss payments, the amounts are larger.

We next show that the patterns in online appendix figure A6 hold up more formally when we estimate the following linear regression over the period March 2020 to May 2021:

$$y_{i,t,z} = \alpha + \beta X_{i,z} + \gamma C_z + \varepsilon_{i,t,z}, \tag{2}$$

where $y_{i,t,z}$ is an indicator variable for whether individual i who lives in zip code z is in forbearance or missed their monthly payment during month t; $X_{i,z}$ is a vector of individual characteristics such as credit score, income, debt levels and debt-to-income ratio, being a small business owner indicator, the number of accounts past due, and age, all measured as of January 2020; and C_z is either a zip code fixed effect or a vector of zip code characteristics.

Table 3. Mortgage Debt Forbearance Regressions

Panel A: Forbearance and individual characteristics

	In forbearance		*Missed payment*	
	(1)	*(2)*	*(3)*	*(4)*
Mortgage balance	0.800***	0.734***	–0.463***	–0.471***
	(0.0243)	(0.0282)	(0.0583)	(0.0702)
Auto loan balance	0.277***	0.257***	0.306***	0.293***
	(0.0119)	(0.0125)	(0.0455)	(0.0579)
Revolving debt balance	0.167***	0.184***	1.010***	0.949***
	(0.0117)	(0.0143)	(0.0395)	(0.0508)
Student loan balance	0.192***	0.195***	0.497***	0.458***
	(0.00940)	(0.0120)	(0.0376)	(0.0497)
Small business owner	0.270***	0.259***	0.476***	0.491***
	(0.00781)	(0.00968)	(0.0447)	(0.0583)
Credit score	–2.779***	–2.717***	–3.721***	–3.765***
	(0.0137)	(0.0174)	(0.0585)	(0.0777)
Income	–0.110***	–0.0720***	–0.418***	–0.334***
	(0.0168)	(0.0189)	(0.0704)	(0.0874)
Number of accounts past due in January	1.243***	1.222***	–0.208***	–0.222***
	(0.0174)	(0.0225)	(0.0319)	(0.0416)
Debt-to-income ratio	0.235***	0.310***	–0.0864	0.0203
	(0.0536)	(0.0584)	(0.0735)	(0.0590)
Age	–0.428***	–0.383***	–2.168***	–2.143***
	(0.00766)	(0.00942)	(0.0595)	(0.0778)
Zip code controls	No	Yes	No	Yes
Zip code fixed effects	Yes	No	Yes	No
Mean of dependent variable	4.622	4.433	72.91	72.73
N	67,150,585	40,375,126	3,101,291	1,789,780
Adjusted R^2	0.041	0.035	0.037	0.014

Consistent with online appendix figure A6, lower credit scores are associated with a higher probability of forbearance for all debt types. Lower income is associated with higher rates of forbearance for mortgages and student loans (table 3 for mortgages, and table A4 in the online appendix for other types of debt). Higher mortgage, auto loan, student loan, or revolving debt balances are strongly correlated with the probability of being in mortgage forbearance. We also find that other proxies for prepandemic creditworthiness predict forbearance: mortgage forbearance rates are higher for individuals with higher debt-to-income ratios and larger numbers of accounts past due as of January 2020. Finally, forbearance rates are also higher among small business owners, a group of borrowers that may have been disproportionately affected by pandemic-related restrictions.

Table 3. Mortgage Debt Forbearance Regressions (*Continued*)

Panel B: Mortgage forbearance and rate

	Forbearance rate	*Scheduled payments missed (%)*
College educated (%)	–0.230***	–0.0949*
	(0.0316)	(0.0373)
Black (%)	0.526***	0.378***
	(0.0294)	(0.0429)
Hispanic (%)	0.662***	0.528***
	(0.0269)	(0.0321)
Prepandemic unemployment rate	0.157***	0.165***
	(0.0369)	(0.0406)
Median age	0.120***	0.173***
	(0.0278)	(0.0350)
Median income	0.163***	–0.0690
	(0.0381)	(0.0708)
Average debt-to-income ratio	0.235***	0.843***
	(0.0586)	(0.196)
Average house price in January	0.0308	0.111**
	(0.0271)	(0.0341)
Mean of dependent variable	4.055	2.960
N	18,078	18,078
R^2	0.0893	0.0796

Sources: Equifax; Zillow; US Census Bureau American Community Survey Five-Year Estimates.

Note: Panel A reports the results from a regression of whether an individual is in forbearance or whether an individual missed their payment while in forbearance each month on various borrower and zip code level variables. Months include March 2020 to May 2021. Columns 1 and 2 are estimated from all individuals with first mortgages; columns 3 and 4 are restricted to individuals who are in forbearance on their first mortgages. Columns 1 and 3 contain individual-level characteristics and zip code fixed effects; columns 2 and 4 contain individual level controls and zip code level controls. Zip code level controls include zip code racial composition, educational attainment, unemployment rate, median age, median income, average combined loan-to-value ratio, average debt-to-income ratio, and median house price. Regression inputs are scaled by standard deviation. Individual controls are taken as of January 2020. Standard errors are clustered at the individual level. Panel B shows the results from regressions of the average monthly forbearance rate and the percent of scheduled payments missed in each zip code on various zip code level characteristics. Average monthly forbearance rates are from March 2020 to May 2021 and the percentage of scheduled payments missed from individuals in forbearance is calculated over the same time period. Analysis is restricted to zip codes with at least ten loans. Regression inputs are scaled by standard deviation.

* = .10; ** = .05; *** = .01

We next reduce our sample to only individuals in forbearance on their mortgage accounts. The dependent variable in equation (2) is whether an individual in forbearance missed their payment. We find that lower-credit-worthiness borrowers are also more likely to draw on the forbearance credit line conditional on obtaining it for all loan categories.

There are two main takeaways from this evidence. First, we find that overall debt forbearance rates on consumer debt are much higher for less

creditworthy and more financially constrained borrowers. This differentiates debt forbearance actions from policy programs like the stimulus checks that target individuals based on their income, regardless of their actual financial conditions.

Second, while lower-income borrowers have much higher forbearance rates, conditional on being in debt forbearance, individuals with higher prepandemic incomes received by far the largest dollar amount of debt relief per individual (online appendix figure A8). This largely reflects much higher debt balances and scheduled loan payments of higher-income borrowers compared to lower-income ones. To illustrate the aggregate implications of this observation we quantify the aggregate dollar amount of financial relief due debt forbearance that flowed to borrowers with above-median income in our data ($37,000). Seventy-two percent ($22 billion) of missed mortgage payments can be accounted for by borrowers with above-median income during the March 2020–May 2021 period (table A3 in the online appendix). Similarly, 49 percent ($2.8 billion) of missed auto payments come from borrowers with above-median incomes, as did 47 percent ($2.2 billion) of missed revolving payments. The percentage of student loan missed payments from above-median individuals is much lower at just 34 percent ($15 billion).

Borrowers across different debt categories have very different levels of income. For example, mortgage borrowers in our sample have a median income of $52,000, which is much higher than the median in the overall population of consumers. Even when we define median income within each product category in panel B of table A3 in the online appendix, we find that higher-income borrowers received over 46 percent ($14 billion) of the total amount of financial relief due to mortgage forbearance. Similarly, we find that student loan borrowers with above-median income ($22,000) account for over 64 percent ($12 billion) of student loan missed payments. High-income revolving debt and auto loan borrowers account for a lower percentage of missed payments, with above-median income auto loan borrowers ($41,000) accounting for 39 percent ($2.2 billion) of total auto loan missed payments and above-median revolving borrowers ($37,000) accounting for 47 percent ($2.2 billion) of missed revolving debt payments. Across both definitions of median income, about 50 to 55 percent of the aggregate dollar amount of financial relief on all debt types flowed to borrowers with higher prepandemic incomes.

Overall, this evidence suggests that debt forbearance policies have mainly affected borrowers who are less creditworthy and more likely to be liquidity constrained. Forbearance rates on student debt, which was subject

to the automatic forbearance mandate, are more uniform across borrower characteristics. Our findings also suggest that debt forbearance importantly complemented other policies targeting US consumers during the COVID-19 pandemic. Unlike policies based mainly on income, such as the stimulus check program, debt forbearance allowed less creditworthy borrowers with higher prepandemic incomes to obtain a significant amount of financial relief.

IV.B. Forbearance and Exposure to COVID-19 Shocks?

While our individual-level data include a rich set of outcomes, they lack information on characteristics that would more precisely proxy for whether a household was affected by COVID-19 shocks, such as infection with COVID-19, race, occupation, or employment. To better understand whether forbearance offered relief to households shocked by COVID-19, we turn to regional data. We explore how regional heterogeneity in the forbearance rates (online appendix figure A10) is related to the zip code socioeconomic characteristics through a series of regressions of the form:

$$y_r = \alpha_r + \beta X_r + \varepsilon_r, \tag{3}$$

where y_r is either the average forbearance rate or the percentage of debt payments missed due to forbearance in region r and X_r is a region r vector of socioeconomic characteristics. Averages are taken over the period from March 2020 to May 2021.

DEBT FORBEARANCE AND RACE We now investigate the intensity of forbearance across zip code racial composition. This analysis is motivated by the observation that the COVID-19 pandemic and its broader economic and health consequences have disproportionately affected minorities, especially Black Americans.

Areas with larger Black or Hispanic/Latino populations have higher mortgage, auto, revolving debt, and student loan forbearance rates (panel B of table 3, and table A5 and figure A9 in the online appendix). Mortgage forbearance rates are also higher in areas with higher debt-to-income ratio and higher prepandemic house prices. We also find that the amount of relief is higher in areas with larger Black and Hispanic/Latino populations across all categories of debt. We compute the amount of relief as payments missed due to forbearance divided by the sum of all scheduled payments in a zip code. This evidence combined with our individual-level findings suggests that an important share of recipients of debt forbearance

are less creditworthy, minority borrowers living in areas with higher house prices, where affordability and debt payment constraints are likely to be more binding.[15]

DEBT FORBEARANCE ACROSS INDUSTRIES AND OCCUPATION The pandemic has had a large impact on industries that require travel and face-to-face interaction, but a much smaller impact on industries where employees are able to easily work from home. Because we do not have individual-level data on borrowers' occupations, we instead investigate whether regions more exposed to industries adversely affected by the pandemic have higher forbearance rates. Zip codes with larger percentages of the population employed in agriculture, education, health, construction, and manufacturing have lower mortgage forbearance rates (table A6 in the online appendix). These occupations are typically considered essential and thus likely continued operations throughout the COVID-19 lockdowns. We also find that areas with more workers able to work from home prior to COVID-19 have lower debt forbearance rates, while regions with larger numbers of service and sales jobs have higher rates of forbearance. We find similar results for auto loan, revolving debt, and student loans in table A6 in the online appendix.

These findings highlight that both forbearance rates and missed payments are higher in regions with a larger presence of industries and occupations hit the hardest by the pandemic. Regions that have larger exposure to industries that involve travel or face-to-face interactions have higher forbearance rates, while regions with larger concentrations of essential industries or industries that can continue operations remotely have lower forbearance rates.

DEBT FORBEARANCE AND COVID-19 IMPACT Forbearance policies appear to benefit regions with high concentrations of jobs disrupted by the pandemic. We find similar results when we more directly measure which regions were most affected by COVID-19—both in terms of infection rates and in severity of lockdowns (figure A11 in the online appendix shows geographical heterogeneity in COVID-19-related characteristics). We reestimate equation (3) by regressing county forbearance rates on county-level characteristics capturing the severity of the COVID-19 impact. Counties with higher average COVID-19 case rates have higher mortgage forbearance rates (table 4 and online appendix figure A12) as well as higher forbearance rates on other types of debt (table A7 in the online appendix). These

15. See An and others (2021), who also document that lower-income and minority borrowers have received debt forbearance at higher rates.

Table 4. Unemployment Claims, COVID-19 Infections, and Other Stimulus

	Forbearance rate	*Scheduled payments missed (%)*
Total unemployment insurance claims (check rate)	0.542***	0.495***
	(0.0525)	(0.0571)
Total COVID-19 case rate	0.216***	0.140*
	(0.0539)	(0.0586)
Change in credit/debit spending	0.0533	0.0673
	(0.0521)	(0.0567)
Change in time spent at workplace	–0.352***	–0.201*
	(0.0879)	(0.0956)
Families receiving full stimulus check (%)	–0.107	–0.218*
	(0.0855)	(0.0929)
Workers in at-risk industry	0.282**	0.318**
	(0.0940)	(0.102)
Amount of PPP received normalized by number of small businesses	–0.292	–0.400*
	(0.156)	(0.170)
Mean of dependent variable	3.841	2.884
N	364	364
R^2	0.3540	0.2790

Sources: Equifax; Opportunity Insights Tracker; US Census Bureau American Community Survey Five-Year Estimates.

Note: This table shows the results from regressions of the average monthly mortgage forbearance rate and the percent of scheduled payments missed in each zip code on various county-level characteristics. Averages are taken over the period from March 2020 to May 2021 and percentage of scheduled payments missed by individuals in forbearance is calculated over the same time period. Analysis is restricted to counties with at least ten loans. Regression inputs are scaled by standard deviation.

* = .10; ** = .05; *** = .01

counties also experience the largest amount of relief (missed payments). We find similar results when measuring the severity of disruption with county unemployment insurance claim rates and percentages of workers in at-risk industries, where at-risk industries are those at most risk of having operations disrupted by the pandemic.[16] On the other hand, we find that counties with greater declines in time spent at the workplace relative to January 2020 have lower forbearance rates. Thus, counties affected more by COVID-19 infections and restrictions experienced higher rates of debt forbearance.

Taken together, our individual and regional analysis suggests that debt forbearance has reached its intended target: financially vulnerable borrowers living in regions that experienced the highest COVID-19 infection rates and the greatest deterioration in their economic conditions.

16. We define at-risk industries according to criteria described by Muro, Maxim, and Whiton (2020).

DEBT FORBEARANCE AND ABSENCE OF HOUSEHOLD DISTRESS ACROSS BORROWERS AND REGIONS Using aggregate data in section III.B, we illustrate that the extent and timing of forbearance is closely related to the delinquency gap, suggesting that forbearance relief was responsible for the absence of household debt distress. The cross-sectional evidence above suggests forbearance reached households and regions that were most likely affected by COVID-19 shocks. Here, we use cross-sectional variation to connect the dots and show that forbearance is highest in the regions where we observe the biggest gap between the expected and actual defaults. In other words, forbearance can explain the absence of household distress in the cross section. Recall that the delinquency gap is computed as an aggregated predicted delinquency across individual borrowers after accounting for local fundamentals such as unemployment and house prices, as well as borrower-level indebtedness such as loan-to-value ratio interacted with local conditions, which should proxy for the fact that some borrowers are more likely to be underwater on their debt than others.

The delinquency gap is largest among borrowers who also received the most forbearance (online appendix figure A13).[17] The delinquency gap and forbearance rates decline in credit scores. Forbearance rates in the highest credit score bin are much higher than the delinquency gap, suggesting that a sizeable share of more creditworthy borrowers have been using forbearance as a liquidity facility or credit line and would not have been in default in the absence of forbearance. We also find larger missing default rates in regions with more minorities (online appendix figure A13, panel b). Regions with more than 20 percent of the population classified as minorities have 3.7 percentage points fewer delinquencies than predicted by fundamentals, which is about 60 percent higher than regions with the smallest minority shares. The delinquency gap is also largest in regions with more households below the poverty level and with lower median income. The lowest income regions have about 1.5 percentage points more missing delinquencies than the highest income regions. Likewise, the delinquency gap in the poorest regions is about 1.8 percentage points larger (about twice as high in relative terms) than that in the richest regions. In all panels, regions with larger missing defaults also receive more forbearance, indicating that the forbearance take-up was highest among borrowers whose expected debt distress was the largest.

17. Figure A14 shows a close overlap between regions with higher shares of missing defaults (panel a) and areas with higher shares of borrowers in forbearance who miss their payments (panel b).

Formally, we explore how the regional heterogeneity in the delinquency gap is related to the zip code socioeconomic characteristics through a series of regressions of the form:

$$y_r = \alpha_r + \beta X_r + \varepsilon_r \tag{4}$$

where y_r is delinquency gap in region r, and X_r is a vector of socioeconomic characteristics in region r. Averages are taken over the period from March 2020 to May 2021.

Regional socioeconomic characteristics that predict forbearance also predict missing delinquencies. Panel a of table A8 in the online appendix shows that areas with low credit scores, larger minority shares, more households below poverty level, and smaller shares of households with college degrees have larger delinquency gaps. Similarly, occupations that are correlated with forbearance are also correlated with missing delinquencies: those that were most affected by the pandemic induced shutdowns. Panel b of table A8 in the online appendix shows that zip codes with larger percentages of the population employed in education, health, agriculture, finance, construction, and manufacturing have smaller delinquency gaps. These occupations likely continued operations throughout the pandemic lockdowns and thus experienced less unemployment. On the other hand, zip codes with larger percentages employed in service occupations had larger delinquency gaps. This is reasonable since service industries were forced to either cease or dramatically reduce operations throughout the pandemic. We also find that regions with more workers able to work from home prior to the pandemic had smaller delinquency gaps. Thus, the cross-sectional evidence confirms our aggregate conclusion that forbearance was to some degree responsible for the absence of household distress.

DEBT FORBEARANCE AND OTHER COVID-19 RELIEF PROGRAMS We conclude this section by investigating the relation between debt forbearance and other stimulus measures to provide suggestive evidence on the extent to which debt forbearance complements these other policies at the region (state) level. Very broadly, the take-up of forbearance in dollar terms is positively related to unemployment benefits and PPP loans. On the other hand, states with higher amounts of stimulus check money per individual obtain relatively less relief through forbearance policies (figure 4, panels A–C).

Figure 4 shows that forbearance and other government programs in the aggregate are positively related to missing defaults. However, the comparison of panel D and E indicates that one dollar of forbearance is much more strongly related to missing defaults compared to other stimulus measures.

Figure 4. Debt Forbearance, Missing Defaults, and Other Stimulus Measures

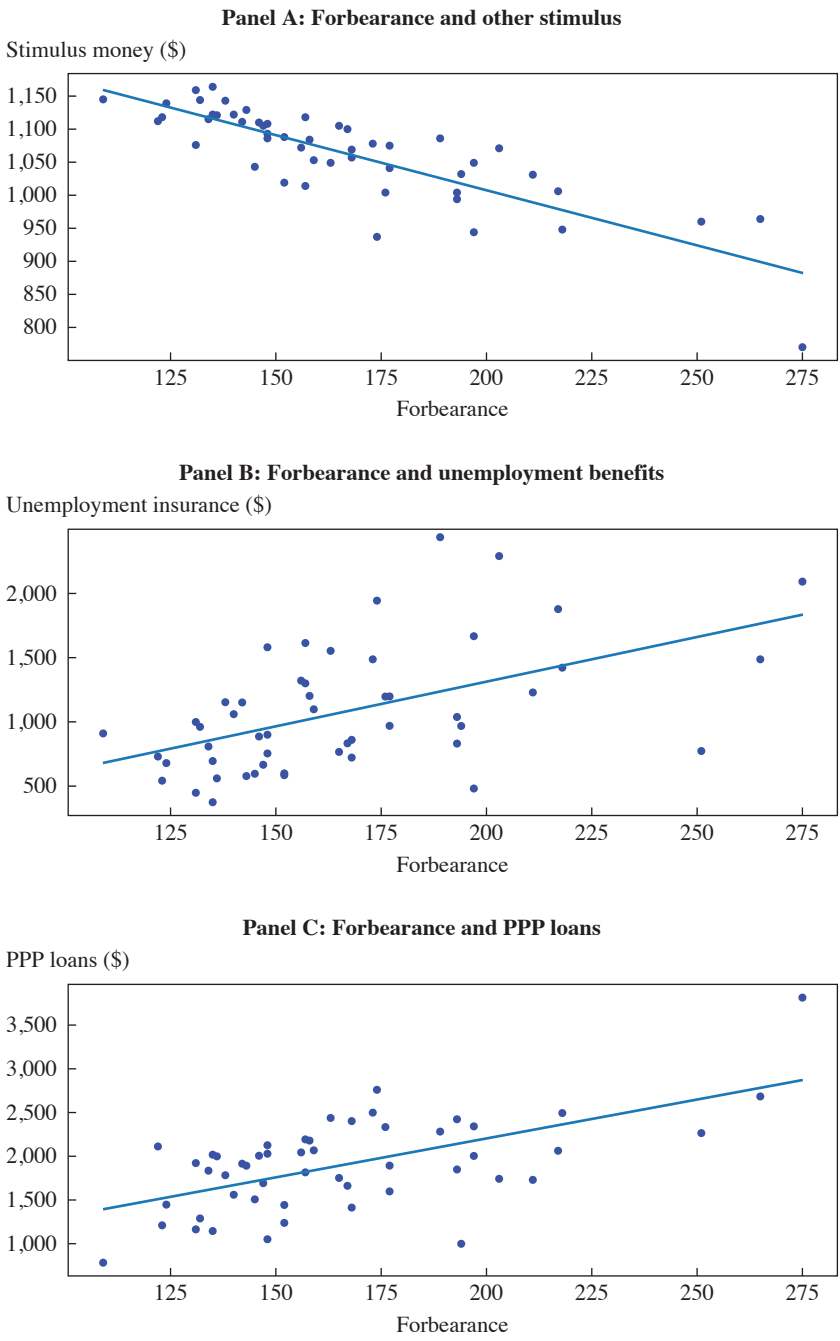
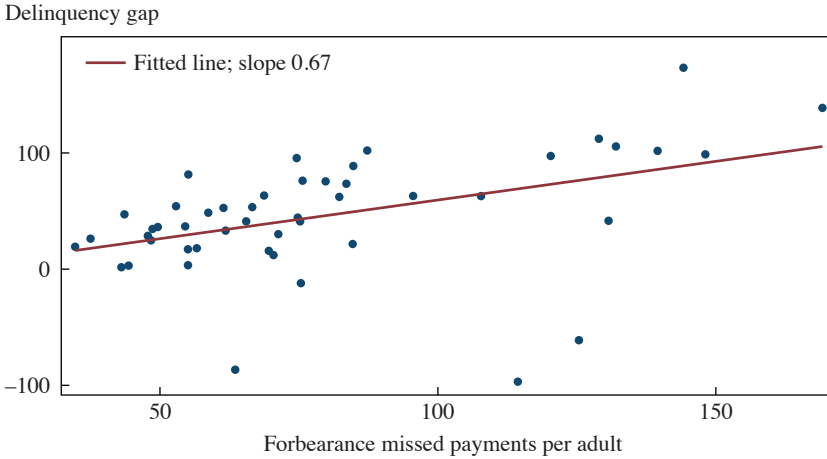
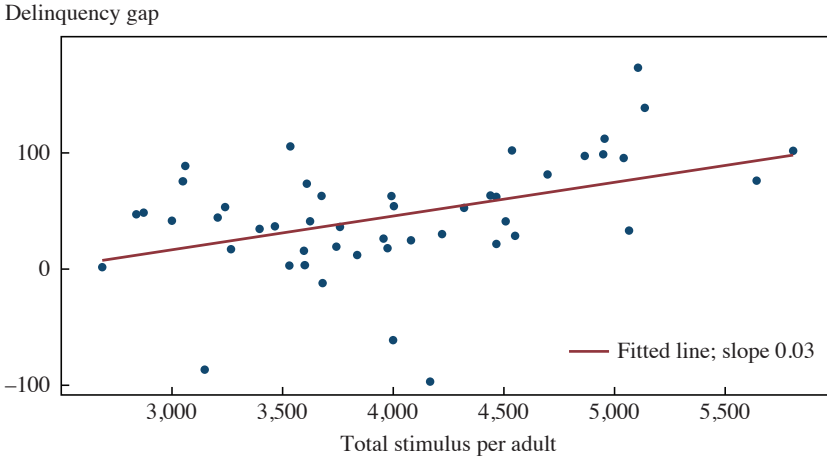


Figure 4. Debt Forbearance, Missing Defaults, and Other Stimulus Measures (*Continued*)

Panel D: Forbearance and missing defaults



Panel E: Other stimulus and missing defaults



Sources: Equifax; Internal Revenue Service; Department of Labor; Small Business Administration; and authors' calculations.

Note: This figure plots the total amount of money missed due to forbearance in a state normalized by the number of adults against the total amount of money received from stimulus checks, PPP loans, and unemployment insurance normalized by the number of adults at the state level. Panel A plots the amount missed through forbearance against the amount received from stimulus checks, panel B plots the amount missed through forbearance against the amount received from unemployment benefits, panel C plots the amount missed through forbearance against the amount received from PPP loans. Amounts are calculated from the months from March 2020 to May 2012. Panel D plots the dollar amount of missing delinquencies per borrower—the difference between model-predicted delinquency and actual delinquency multiplied by January scheduled payments—against forbearance missed payments per adult. Panel E plots missing delinquencies against the total amount of other government stimulus per adult.

For every $100 in missing payments through forbearance, we observe about $70 of missing delinquencies (slope 0.67). Every $1,000 stimulus is associated with about $30 of missing delinquency payments (slope 0.03). These associations suggest that, per dollar of stimulus, forbearance is much better targeted in terms of preventing defaults compared to other stimulus measures. Figure A15 in the online appendix shows the associations between each of these programs and missing defaults. Unemployment benefits are most closely related to dollar amount of missing delinquencies, followed by PPP loans, whereas stimulus checks do not show a positive association. This is not surprising, since stimulus checks mainly target individuals with lower incomes—that is, those individuals who are more likely to be renters or living in less expensive homes and thus are less exposed to forbearance related relief (in dollar terms).

Overall, these findings are in line with our individual-level evidence, which suggests that debt forbearance may have importantly complemented other stimulus measures. Debt forbearance provided significant financial relief to individuals and regions with higher prepandemic incomes who were not directly targeted by the income-based programs such as stimulus checks but who were nevertheless credit constrained and affected by COVID-19. There are also other factors that might have contributed to the missing household debt distress channel. For example, home equity was historically high prior to the pandemic. While our missing delinquency model captures home equity changes through the interaction of the loan-to-value ratio and house price changes, such delinquencies may not lead to foreclosures. Moreover, given how well capitalized the banking system was going into the crisis, and the Federal Reserve's aggressive stance in purchasing mortgage-backed securities and lowering interest rates (Milstein and Wessel 2021), the forced sales may not have depressed house prices or available lending. Both factors could have prevented the downward spiral through feedback of house price decline to the real economy.[18] Another factor on this front is the relaxed refinancing requirement, as a considerable amount of funds were transferred to households refinancing their mortgages. Golding and others (2020) estimate more than $100 billion transfer through this form, which is as an additional source of support during the pandemic.

18. According to Federal Reserve Bank of New York Research and Statistics Group, about half of the 1 percent increase in housing prices relative to the same period in 2019 in the months of April through August 2020 was due to a decline in sales that could be attributed to forbearance and to the lack of sales that would have resulted without forbearance (Anenberg and Scharlemann 2021).

V. Government Mandates for Debt Forbearance

We conclude our analysis by studying the significant role of the private sector in extending debt relief. Financial institutions provided substantial debt forbearance in segments (auto loans and revolving debt) outside explicit government mandates as well as in mortgage segments, which were not covered by the government mandate (see figure 2). In aggregate, more than 20 percent of financial relief due to forbearance was provided outside of the government mandates. This evidence suggests that a considerable amount of debt forbearance would have existed even in the absence of explicit government mandates embedded in the CARES Act. We next exploit the variation in government mandates across different types of loans to better understand the role of two forces in determining the extent and incidence of debt relief: self-selection by borrowers and implicit forbearance subsidies by government programs.

V.A. Debt Forbearance Mandates: The Role of Self-Selection

There are generally two steps in determining which borrowers obtain debt relief. First, the borrower must request relief from the lender—self-selection. Second, the lender must agree to provide relief. As we discuss in section I.A, the CARES Act guaranteed forbearance for all government-backed mortgages, accounting for about two-thirds of outstanding mortgage debt for borrowers who requested it. Borrowers did not have to request forbearance on federally held student loans, which were automatically placed in administrative forbearance. On the other hand, auto loans and revolving debt was not directly affected by the CARES Act, so lenders were not required to grant forbearance on these debt types.

The take-up rate of mortgages covered by the government mandate is a priori evidence that self-selection is a first-order force in determining forbearance rates. Less than 10 percent of eligible borrowers requested relief, and of those, about three-quarters took advantage of the ability to defer payments. Because borrowers had to apply, but forbearance was mandated conditional on application, borrowers' self-selection is driving the forbearance rates for these loans.

Self-selection also seems to be the first-order drive of the distribution of forbearance across income and creditworthiness. We already documented that forbearance rates decline in income and creditworthiness for private and government loans across mortgages, part of which are covered by government mandates, as well as auto loans and revolving credit. In figure A16 in the online appendix, we narrow the comparison to mortgages

and consider how forbearance rates vary across borrower characteristics based on whether the mortgage is covered by the government mandate. The distribution of debt relief across borrower characteristics is quite comparable between government and private mortgages. The same holds for the fraction of borrowers in forbearance who miss payments (figure A17 in the online appendix).

Self-selection also seems to be responsible for the correlation between COVID-19 shocks and forbearance. We reestimate regressions from table 4 for mortgages stratified by whether they are eligible for government mandates (table A9 in the online appendix). Forbearance patterns are broadly similar for both types of mortgages—regions with higher unemployment insurance claims, more COVID-19 cases, and higher percentages of workers in at-risk industries have higher rates of forbearance (though some of these associations are insignificant). These results suggest that borrowers' self-selection is important in determining how relief is allocated. This self-selection might explain why the program has been effective at preventing household debt distress, despite its smaller expenditures, especially since many missed payments will eventually be repaid.

V.B. Implicit Forbearance Subsidies

Private debt relief is presumably a result of an (ex ante) mutually beneficial renegotiation. Government-mandated relief does not need to be mutually beneficial: it can result in a transfer from the lender (government) to the borrower. Such subsidies to household debt relief may very well be warranted in the presence of renegotiation frictions and aggregate spillover. Because CARES Act eligible debt differs from private debt both in its type and in the types of borrowers, it is difficult to evaluate the magnitude of subsidies.

To evaluate the importance of implicit government subsidies we exploit a size discontinuity in eligibility of mortgages for relief under the CARES Act. We first start by considering all mortgages and reestimate the specifications in table 3 with an additional control, *Mandate*, that is an indicator variable that takes on the value of one if the loan is covered by forbearance mandates under the CARES Act (Fannie Mae, Freddie Mac, FHA, and VA loans) and is zero otherwise. Panel A of table 5 shows that loans covered by the mandate are about 1.4 percentage points more likely to be in forbearance, implying about a 30 percent higher forbearance rate relative to loans not covered by the forbearance mandate. There are not economically meaningful differences in the share of borrowers missing payments between these two categories of loans.

Table 5. Government Mandates, Mortgage Forbearance, and Missing Defaults

Panel A: Forbearance and government mandates (all mortgages)

	In forbearance		*Missed payment (%)*	
	(1)	*(2)*	*(3)*	*(4)*
Mandate	1.401***	1.405***	0.430**	0.367*
	(0.0157)	(0.0191)	(0.135)	(0.173)
Mortgage balance	0.415***	0.416***	–0.0804	0.0127
	(0.0430)	(0.0412)	(0.0952)	(0.150)
Auto loan balance	0.289***	0.268***	0.132*	0.122
	(0.0132)	(0.0132)	(0.0526)	(0.0687)
Revolving debt balance	0.215***	0.232***	1.088***	1.023***
	(0.0117)	(0.0147)	(0.0439)	(0.0569)
Student loan balance	0.236***	0.242***	0.494***	0.469***
	(0.00955)	(0.0123)	(0.0395)	(0.0515)
Small business owner	0.299***	0.292***	0.486***	0.526***
	(0.00834)	(0.0104)	(0.0501)	(0.0659)
Credit score	–2.671***	–2.602***	–3.879***	–3.999***
	(0.0136)	(0.0170)	(0.0632)	(0.0843)
Income	–0.138***	–0.114***	–0.155	–0.0712
	(0.0183)	(0.0194)	(0.0831)	(0.110)
Number of accounts past due in January	1.122***	1.106***	–0.132***	–0.182***
	(0.0155)	(0.0205)	(0.0339)	(0.0445)
Debt-to-income ratio	0.188***	0.248***	0.149	0.280***
	(0.0383)	(0.0439)	(0.0903)	(0.0628)
Age	–0.558***	–0.510***	–1.799***	–1.724***
	(0.00877)	(0.0102)	(0.0638)	(0.0846)
Zip code controls	No	Yes	No	Yes
Zip code fixed effects	Yes	No	Yes	No
Mean of dependent variable	4.564	4.366	70.44	70.19
N	50,101,202	30,108,659	2,284,682	1,314,435
Adjusted R^2	0.039	0.033	0.037	0.014

(*continued on next page*)

To conduct a tighter comparison, we exploit a size discontinuity in eligibility of mortgages for relief under the CARES Act. When a loan exceeds the limits set by the Federal Housing Finance Agency, it cannot be purchased, guaranteed, or securitized by GSEs and is thus not covered by the mandate.[19] Panel A of figure 5 shows that forbearance rates are approximately 1.6 percentage points lower to the right of the conforming loan limit, which corresponds to loans not covered by the mandate. Panel B of figure 5 shows that prior to the pandemic, forbearance rates were slightly

19. These origination loan balance limits were $417,000 for a single-family home in most regions and $625,000 in some regions through most of the last decade reaching $510,400 and $765,600, respectively, by 2020 after their progressive increases during 2017–2020.

Table 5. Government Mandates, Mortgage Forbearance, and Missing Defaults (*Continued*)

Panel B: Forbearance rates and missing defaults around the conforming loan limit

	Window ± 5%			
	Forbearance rate		*Missing defaults*	
	(1)	*(2)*	*(3)*	*(4)*
Conforming	1.762***	1.722***	0.729***	0.565***
	(0.155)	(0.180)	(0.101)	(0.119)
Mean of dependent variable	5.428	5.227	2.552	2.341
Zip code controls	No	Yes	No	Yes
Zip code fixed effects	Yes	No	Yes	No
N	858,238	524,673	555,692	340,236
Adjusted R^2	0.110	0.036	0.37	0.29
	Window ± 10%			
	Forbearance rate		*Missing defaults*	
	(5)	*(6)*	*(7)*	*(8)*
Conforming	1.667***	1.639***	0.676***	0.604***
	(0.115)	(0.136)	(0.0755)	(0.0919)
Mean of dependent variable	5.358	5.173	2.556	2.385
Zip code controls	No	Yes	No	Yes
Zip code fixed effects	Yes	No	Yes	No
N	1,466,553	896,192	945,697	577,945
Adjusted R^2	0.089	0.034	0.34	0.30

Sources: Equifax; Zillow; US Census Bureau American Community Survey Five-Year Estimates.

Notes: Panel A reports the results from a regression of whether an individual is in forbearance or missed their payment while in forbearance each month on various borrower and zip code level variables. Mandate is an indicator variable that takes on the value of one if the loan is covered by forbearance mandates under the CARES Act (Fannie Mae, Freddie Mac, FHA, and VA loans) and zero otherwise. Columns 1 and 2 are estimated for all individuals with first mortgages; columns 3 and 4 are restricted to individuals who are in forbearance on their first mortgages. Columns 1 and 3 contain individual level characteristics and zip code fixed effects; columns 2 and 4 contain individual level controls and zip code level controls. Standard errors are clustered at the individual level.

Panel B of this table reports the results from a regression of whether an individual is in forbearance (columns 1, 2, 5, and 6) on various borrower and zip code level variables, including an indicator for whether the mortgage is a jumbo loan. Columns 3, 4, 7, and 8 show the corresponding results for a regression of missing defaults rate—the difference between the model-predicted delinquency probability and the actual delinquency status on various borrower and zip code level variables, including an indicator for whether the mortgage is a jumbo loan. Odd columns contain zip code level fixed effects and even columns include zip code level controls. Analysis is restricted to mortgages with balances that fall within 95–105 percent of the conforming loan limit (90–110 percent in columns 5–8). Jumbo loans are loans that fall above 100 percent of the conforming loan limit and are not covered by forbearance mandates under the CARES Act. Conforming loans are Fannie Mae and Freddie Mac mortgages that fall below 100 percent of the conforming loan limit. Standard errors are clustered at the loan level. Borrower level controls include student debt balance, auto debt balance, revolving debt balance, age, income, credit score, debt-to-income (DTI) ratio, number of accounts past due, and small business owner.

For both panels months include March 2020 to May 2021. Zip code level controls include zip code racial composition, educational attainment, unemployment rate, median age, median income, average combined loan-to-value ratio, average DTI, and median house price. Regression inputs are scaled by standard deviation. Individual (panel A) and borrower (panel B) control variables are taken as of January 2020.

* = .10; ** = .05; *** = .01

Figure 5. Government Mandates: Mortgage Forbearance and Defaults around the Conforming Loan Limit

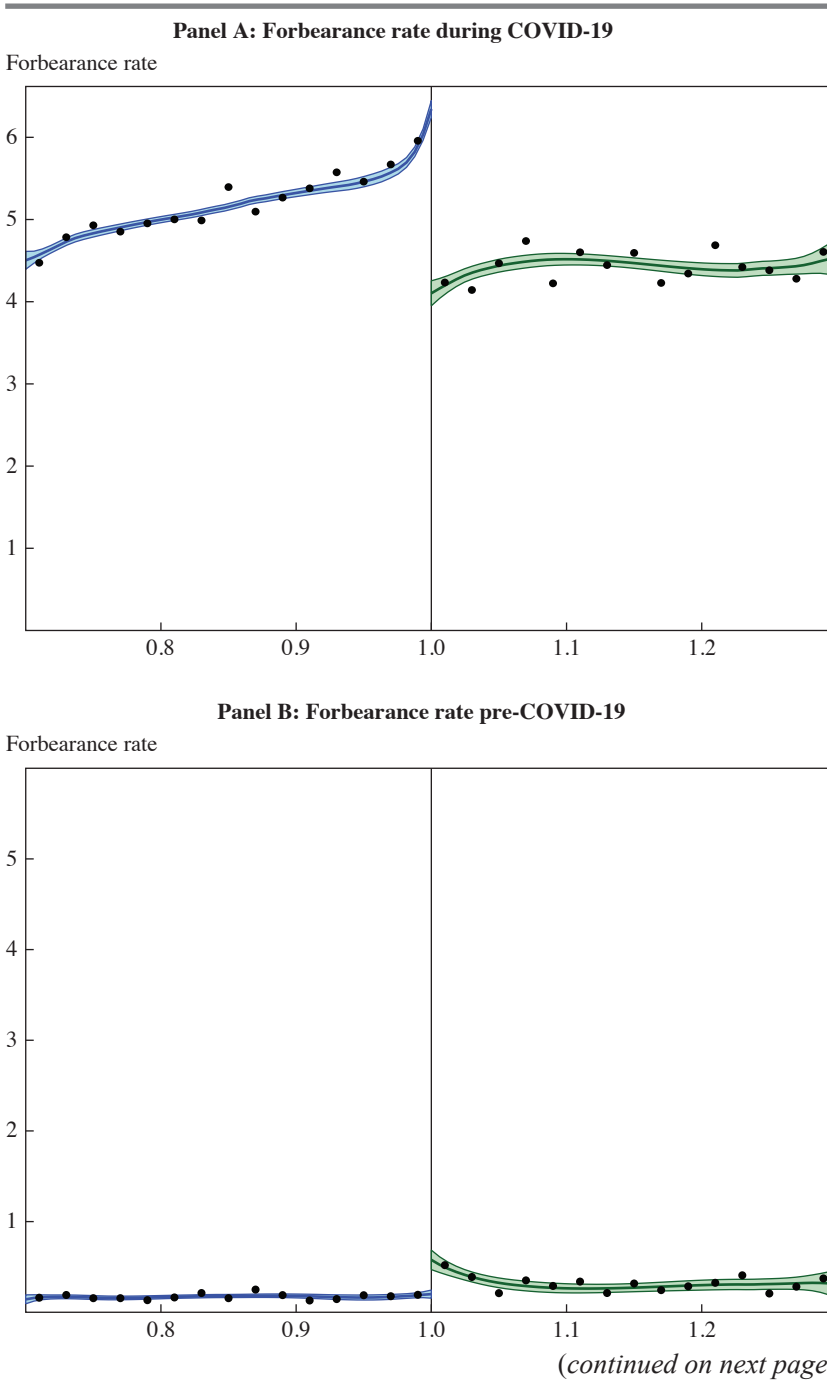


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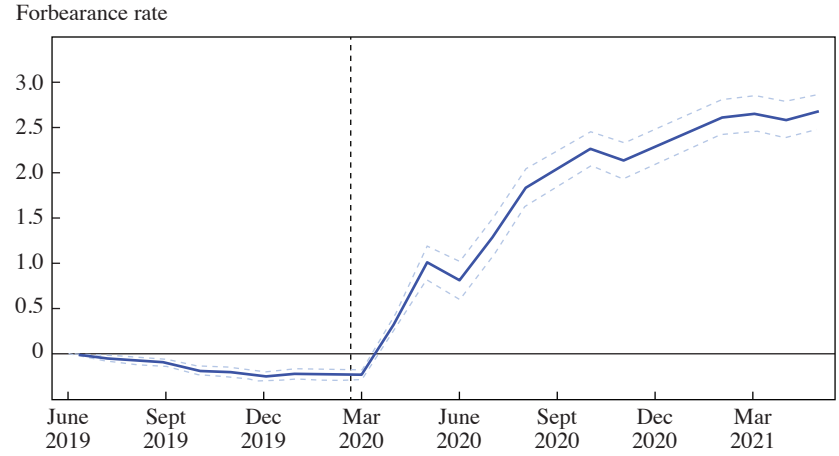
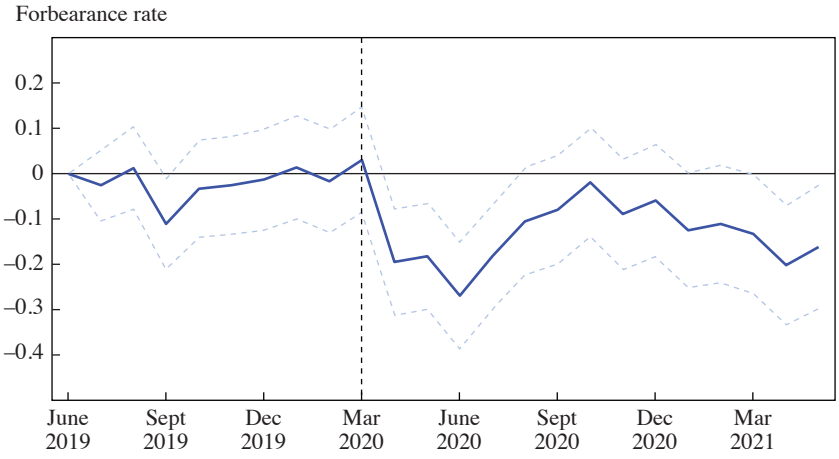
Figure 5. Government Mandates: Mortgage Forbearance and Defaults around the Conforming Loan Limit (*Continued*)

Panel C: Change in forbearance rates of conforming loans relative to jumbo loans



Panel D: Change in delinquency rates of conforming loans relative to jumbo loans



Source: Equifax.

Note: We restrict our analysis to mortgages with balances that fall within 70–130 percent of the conforming loan limit. Panel A shows results during the COVID-19 period (March 2020 to May 2021). Dots represent forbearance rates in 1 percent bins by the loan's percentage of the conforming loan limit. Third-degree polynomials are fit on either side of the conforming loan limit. Shaded bands show the 95 percent confidence interval. Panel B shows the same plot during the prepandemic period (January 2020 to February 2020). Jumbo loans are loans that fall above 100 percent of the conforming loan limit (solid line) and are not covered by forbearance mandates under the CARES Act. Conforming loans are loans that fall below 100 percent of the conforming loan limit and that carry the government guarantees (e.g., through Fannie Mae or Freddie Mac). Panel C shows the estimated differential changes in forbearance rates on conforming loans relative to jumbo loans along with 95 percent confidence intervals from June 2019 to May 2021. Panel D shows the corresponding results for the delinquency rate. The dashed vertical line shows the declaration of national emergency due to COVID-19 and the passage of the CARES Act. The data from Equifax comprise a 10 percent representative sample of the US credit population.

higher for loans not covered by the mandate, although the difference is economically small. Panel B of table 5 confirms these results and shows that accounting for borrower and loan characteristics, mandated loans to the left-hand side of the balance limit have forbearance rates that are about 1.6–1.7 percentage points higher.

We next formally estimate the amount of government loans that obtained relief above what the private sector would have provided. We exploit the size discontinuity within a difference-in-differences design. We consider only mortgages with balances that fall within 70 percent to 130 percent of the conforming loan limit and restrict ourselves to mortgages owned by the government below the loan limit. Loans of these sizes should be relatively comparable, although those with balances below the conforming limit are covered by government forbearance mandates. We estimate:

$$Forbearance_{i,t,z} = \alpha + \beta_1 Conf_{i,z} + \beta_2 Pandemic_t + \beta_3 Pandemic_t * Conf_{i,z} + \gamma X_{i,z} + \theta Z_z + \varepsilon_{i,t,z}, \quad (5)$$

where $Forbearance_{i,t,z}$ is an indicator for whether loan i located in zip code z is in forbearance during month t. $Conf_{i,z}$ (conforming) is an indicator for whether the loan is government insured and eligible for government forbearance, $Pandemic_t$ is an indicator that takes on the value of zero prior to March 2020 and one from March 2020 to May 2021, $X_{i,z}$ is a vector of borrower-level characteristics, and Z_z is either a vector of zip code controls or fixed effects. The 1.65–1.71 percentage point coefficient on the interaction term $Pandemic_t * Conf_{i,z}$ implies that, during the pandemic, mortgages covered by the government-mandated loans were about 37 percent more likely to be in forbearance relative to ineligible mortgages (columns 1–2 of table A10 in the online appendix). Panel C of figure 5 shows the pattern of these differences over time in our sample period. The divergence between the groups begins in April–May 2020 and has continued to increase over the period. This result indicates that the mandatory approval of loan forbearance indeed increased debt relief beyond what might have been the outcome of private renegotiation between the lenders.

Taken together these results suggest that implicit government debt relief subsidies embedded in the CARES Act mandates increase the rate of forbearance by about a third. Hence, about a quarter of forbearance provided on loans covered by the government mandates is subsidized, and the rest is provided to borrowers who would have been eligible under a private

benchmark. Moreover, we find that forbearance was distributed in a similar manner across borrower characteristics in both groups (figure A16 in the online appendix), borrowers in both groups had similar rates of missing payments (figure A17 in the online appendix), and exits from forbearance are similar across the two groups. This suggests that the private sector could have increased forbearance rates toward those observed on loans covered by the mandates without sacrificing much of forbearance efficiency, at least in the short run.

Lastly, we use the discontinuity to further validate that debt forbearance can account for a substantial portion of prevented defaults during the pandemic, complementing the aggregate and cross-sectional evidence. We relate the above forbearance gap around the conforming limit to missing defaults computed in section III.B. We conduct the same regression discontinuity analyses replacing forbearance with delinquency gap as an outcome variable. Accounting for borrower and loan characteristics, the loans covered by the mandates have a delinquency gap about 0.7 percentage points higher on average (table 5, panel B). Comparing these estimates to those of the forbearance rate indicates that two mortgage forbearances are associated with one missing delinquency, the same ratio as in the aggregate data (section III.B). Finally, consistent with this observation, panel D of figure 5 (and table A10 in the online appendix) shows that after the pandemic started we see a relative decline in the delinquency rates of conforming loans relative to jumbo loans.[20]

Overall, these results suggest that the government mandates prevented additional delinquencies and validate that forbearance can account for a substantial reduction of delinquencies. The estimates are likely a lower bound on the effect of mandates. First, government mandates could have increased private forbearance supply. For example, standards set by the CARES Act might have not only provided servicers simple rules for the private sector to follow but also imposed reputational concerns on servicers who did not supply forbearance for loans not covered by the mandates. Second, when predicting delinquencies, we rely on actual house price movement during the pandemic. Without government relief programs, the realized house prices would likely be lower. Stabilizing house prices could

20. Notably, figure A18 in the online appendix shows the delinquency rates prior to the pandemic around the threshold. Prior to the pandemic, residualized delinquency rates were similar around the threshold, suggesting that the post-COVID-19 delinquency gap is not driven by preexisting differences in the default likelihood of borrowers around the conforming loan limit threshold.

have prevented further distress of private loans. On the other hand, it is possible that mandated forbearance could have crowded out additional private forbearance.

V.C. The Supply of Debt Relief and the Regulatory Regime of Servicers

Servicers who collect payments from borrowers oversee which borrowers obtain forbearance. This is the case even for mortgages covered by the government mandate. Intermediary specific factors (e.g., capacity constraints) played a significant role in implementation of debt relief during the Great Recession (Agarwal and others 2017; Fuster, Lo, and Willen 2017; Piskorski and Seru 2018, 2021). One important innovation in the implementation of forbearance in the CARES Act was that the servicer did not have to determine borrowers' eligibility for forbearance. Formally, all borrowers must do is ask. So there should be little scope for differences in the intermediary supply of forbearance under government mandates. Despite that mandate, we document differences in forbearance rates across different types of servicers.

Lenders can be divided into two broad groups based on their regulatory structure: banks and shadow banks. Shadow banks—nondepository institutions—now account for about half of loan originations in the mortgage market (Buchak and others 2018; Jiang 2020; Jiang and others 2020). We show that the regulatory type of the financial intermediary is correlated with its provision of forbearance even under the same government mandate using Fannie Mae loan-level data, which have detailed information on the identity of the financial institution that originated the loan. All Fannie Mae loans had mandated forbearance under the CARES Act.

During the initial stage of the pandemic, loans originated by banks have rates of debt forbearance about 2 percentage points higher than shadow banks, and the difference persists throughout the period (panel A of figure A19 in the online appendix). We cannot completely rule out the alternative that borrowers serviced by shadow banks have different demand for forbearance. However, in table 6, we show that even controlling for extensive borrower characteristics and locations, the 2 percentage point difference persists despite their very similar characteristics. This result strongly suggests that despite the blanket government mandate, who implements forbearance has a sizeable effect on the amount of debt relief provided.

We can also divide loans based on whether the institution that originated the loan is also the servicer. Panel b of figure A19 in the online appendix shows that loans for which the servicing was outsourced also have lower rates of forbearance. In unreported results we find that this

Table 6. Forbearance Rates: Bank versus Shadow Bank Loans

	(1)	*(2)*	*(3)*
Pandemic	7.17***	7.05***	7.03***
	(0.16)	(0.15)	(0.15)
Shadow bank	0.02***	−0.71***	−0.76***
	(0.00)	(0.02)	(0.03)
Pandemic × shadow bank	−1.57***	−1.60***	−1.59***
	(0.05)	(0.05)	(0.05)
Borrower controls	No	Yes	Yes
Zip code fixed effects	No	No	Yes
R^2	0.03	0.05	0.05
N	48,896,508	48,085,901	48,085,901

Source: Fannie Mae Loan Level Performance Data.

Note: This table presents loan-level regression results of forbearance rate by bank and shadow bank. The dependent variable indicates whether the loan is in forbearance. "Pandemic" indicates whether the reporting period is after March 2020. Column 1 contains no borrower controls or zip code fixed effects, column 2 contains borrower controls but no zip code fixed effects, and column 3 contains both borrower controls and zip code fixed effects. The sample covers all loans sold to Fannie Mae since 2000 and that were still active as of January 2020. Since the GSEs do not disclose identity of servicers that service less than 1 percent of total unpaid outstanding balance, we remove loans without identified servicers. The observations are at monthly level from January 2020 to June 2020. Standard errors are clustered by zip code.

*** = .01

effect is mainly driven by bank-originated loans. One potential mechanism is that loan originators have more information about borrowers than outsourced servicers, so they can more easily tell which borrowers really require relief. This would imply that even in government-mandated relief, servicers try to evaluate whether forbearance should be granted, which would be at odds with the formal mandate. Overall, the evidence suggests that intermediary specific factors played a meaningful role in implementation of the government mandates and may have affected the overall level of debt relief provided. The regulatory framework of the servicers as well as potential access to information may have played a role in determining the supply response.

VI. Unwinding Debt Forbearance

Our results suggest that debt forbearance played an important role in muting the household debt distress channel during the pandemic by allowing millions of borrowers to postpone their debt repayments. Forbearance is designed to bridge temporary liquidity shocks faced by households—deferred payments need to be repaid. An important policy question is thus how forbearance will be unwound after it expires. We first analyze the

Table 7. Mortgage Debt Forbearance Exits

Panel A: Mortgage debt forbearance exit types

	Number of consumers	*Consumers who exit (%)*
Owe nothing	994,950	37
Reinstatement	412,690	15.4
Paid off or refinanced	116,390	4.3
Increased monthly payments	1,254,150	45
Increased balance	679,510	24
Loan modification flag	187,430	7

Panel B: Loan characteristics and forbearance exits

	Owe nothing	*Reinstatement*	*Paid off or refinanced*	*Increased balance*	*Loan modification flag*	*Increased payments*
Mortgage balance	206,194 [201,490]	215,628 [183,476]	264,513 [216,663]	215,921 [166,697]	192,581 [147,514]	209,243 [166,009]
Missed payments	0 [0]	1,322 [8,867]	7,156 [70,677]	8,747 [31,394]	4,373 [9,446]	4,981 [31,163]
Credit score	684 [101]	680 [97]	716 [79]	640 [105]	604 [100]	674 [97]
Income	55,234 [25,154]	54,607 [24,570]	63,292 [25,738]	52,858 [22,656]	45,768 [18,151]	54,137 [23,342]
Duration of forbearance (months)	4.29 [2.91]	4.67 [3.02]	4.12 [2.51]	6.28 [3.42]	6.04 [3.92]	5.4 [3.19]

Source: Equifax.

Note: The table is computed based on more than 2.6 million consumers who exited mortgage forbearance policies as of May 2021 for whom we have information regarding the manner of their exit. Standard deviations are in parentheses.

extent and nature of exits from forbearance that had already occurred in our data up to May 2021. We then discuss various ways of unwinding the substantial outstanding debt forbearance. We focus on mortgage debt forbearance, which is associated with the largest amount of debt forbearance overhang per individual (see table 2).

About 6 million mortgage borrowers entered mortgage debt forbearance during the pandemic. Of those borrowers, more than 4 million had exited forbearance as of May 2021. The remaining 1.7 million borrowers remained in forbearance, with 1.1 million borrowers missing payments. In panel A of table 7 we begin by examining forbearance exit plans for about 2.6 million mortgage borrowers who left forbearance for whom we can observe the manner of their exit.

A substantial share of borrowers either exit forbearance with no missed payments or quickly catch up on missing payments. Almost 994,000 borrowers (37 percent of those who exited) owed nothing upon exiting. Another

412,000 borrowers (15 percent) had their mortgages reinstated upon exiting forbearance, meaning they repaid all their missed payments within two months; 116,000 borrowers (4.3 percent) paid off or refinanced their loan. Panel B of table 7 shows borrower and loan characteristics by forbearance exit plans.[21] On average, borrowers who paid off or refinanced their mortgages had relatively high mortgage balances ($264,513), high incomes ($63,292), and high credit scores (716). They were also in forbearance for a relatively short period of time, with an average forbearance duration of 4.1 months. Borrowers who owed nothing or repaid missing payments in a lump sum also had relatively high credit scores and incomes and relatively short forbearance durations. In other words, for a substantial share of exiting borrowers, forbearance provided relief from temporary shocks, similar to a line of credit.

Other borrowers either increased the mortgage balance (nearly 680,000 borrowers) or increased their monthly payments (1.25 million borrowers) upon leaving forbearance. About 187,000 individuals (7 percent) had their loans modified on exit. Borrowers who exited forbearance with an increased balance, increased monthly payments, or loan modifications had lower mortgage balances on average, as well as lower incomes and credit scores. They also stayed in forbearance for a longer amount of time, with an average forbearance duration of six months. This suggests that such borrowers may have faced more severe solvency issues which temporary forbearance alone could not overcome.

In addition, close to 20 percent of mortgage borrowers who entered forbearance continued to be in forbearance and miss payments by May 2021, suggesting that they may face more serious and persistent adverse economic and financing conditions. Table 8 suggests that exit from forbearance was faster in areas with more favorable economic conditions (see figure A20 in the online appendix for regional distribution). Regions with larger unemployment increases from February 2020 to May 2021 had larger percentages of borrowers remaining in forbearance and missing payments, as did regions with higher minority shares. Regions experiencing increases in house prices from February 2020 to May 2021 had slightly lower percentages of borrowers remaining in forbearance or missing payments. Education also appears to play a role, with zip codes with a more highly educated population experiencing fewer borrowers remaining in forbearance or missing payments, as shown in table 8.

21. Our forbearance exit statistics for GSE loans are also broadly in line with reports based on the internal GSE data (McManus and Yannopoulos 2021).

Table 8. Mortgage Borrowers Remaining in Forbearance and Regional Characteristics

	(1) *Remaining in forbearance (%)*	*(2)* *Remaining in forbearance with missing payments (%)*
Unemployment change	4.038***	2.470***
	(0.228)	(0.209)
House price change	–0.182	–0.194
	(0.207)	(0.184)
Median income	–0.391	0.0287
	(0.366)	(0.305)
Median debt-to-income ratio	1.294	0.846
	(0.708)	(0.463)
Black (%)	3.719***	2.742***
	(0.242)	(0.222)
Hispanic (%)	2.636***	1.629***
	(0.249)	(0.233)
College educated (%)	–2.953***	–1.623***
	(0.294)	(0.266)
House prices in January 2020	0.187	0.0797
	(0.194)	(0.175)
Median age	0.421	0.300
	(0.257)	(0.230)
Prepandemic unemployment rate	1.281***	0.642*
	(0.299)	(0.274)
N	18,590	18,590
Adjusted R^2	0.0762	0.0378

Sources: Equifax; Zillow; US Census Bureau American Community Survey Five-Year Estimates.

Note: This table shows the results from regressions of the percentage of individuals remaining in forbearance on various zip code level characteristics. In column 1, the dependent variable is the percent of individuals in a zip code who were in forbearance for at least one month during the pandemic and remained in forbearance as of May 2021. In column 2, the dependent variable is the percentage of individuals in a zip code who were in forbearance for at least one month during the pandemic and both remained in forbearance and had missing payments as of May 2021. Regression inputs are scaled by standard deviation.

* = .10; *** = .01

Looking more broadly at all debt categories, while about 60 percent of borrowers had already exited forbearance as of May 2021, more than 40 percent of 72 million Americans who entered forbearance during the pandemic were still missing about $60 billion on their debt repayments. At this rate, by September 2021 when forbearance mandates were set to expire, we estimate that these borrowers with persistent forbearance spells will be left with a forbearance overhang of more than $70 billion in accumulated postponed repayments. This estimated forbearance debt overhang amounts to about $3,900 per individual, which is about 1.5 times their average monthly income, and more than 2.2 times for lower income borrowers. For mortgage borrowers, the largest debt category, the estimated forbearance debt overhang is about $15 billion, amounting to about $14,200 per

individual (about 3.4 times their average monthly income). Moreover, as we discussed above, these borrowers with long periods of forbearance are more likely to be in lower income, higher unemployment, and higher minority share areas.

If deferred payments due to forbearance are structured as a onetime (bullet) payment, which is due immediately after forbearance ends, a significant share of these borrowers may enter distress even if this payment is anticipated. Structuring forbearance by spreading these repayments over time would alleviate households' liquidity constraints at potentially low cost to the lenders. Depending on the degree of consumer foresight and ability to smooth their consumption, the upfront versus deferred repayments could have significantly different consequences for consumers (Eberly and Krishnamurthy 2014; Piskorski and Seru 2018). Either way, the extent of forbearance overhang and its concentration among more vulnerable borrowers and regions suggest that the unwinding of forbearance could have first-order consequences for household debt distress and, through it, for the aggregate economy (Mian and Sufi 2014a).

We discuss below a few practical solutions to unwind forbearance overhang in the mortgage market, where this overhang is the largest per individual. Most of the mortgages in forbearance, including those of the most vulnerable borrowers, are insured through the government-backed programs, allowing wide latitude in implementation. The GSEs could provide clear guidance to mortgage servicers to add these missed payments to the loan balance of borrowers. Given that the remaining loan maturity for mortgage borrowers in forbearance is about twenty-five years, this would spread out the repayment of accumulated debt over a long period of time.

To illustrate this point, we use average mortgage terms of borrowers in forbearance (see table A11 in the online appendix) and consider the case of a borrower who, upon forbearance exit, misses one year of mortgage payments amounting on average to about $12,000–15,000 per borrower (FHA versus GSE borrowers). Instead of paying these amounts up front in one shot, adding these amounts to the principal balance would imply that the borrowers would face an increase in monthly mortgage payments of about $90–120 on average—a much more manageable increase in financial burden.

In addition, the government could consider a refinancing program that would allow borrowers in forbearance with federally insured mortgages to refinance their loans while increasing the loan balance of the new loan by the accumulated amount of missed payments in forbearance. Since borrowers in forbearance face mortgage rates considerably higher than the

current mortgage rates (in excess of 4 percent on their legacy loans, on average), such refinancing could lower the overall mortgage payment burden of these borrowers.[22]

VII. Conclusion

We follow a representative panel of more than 20 million US consumers and analyze the widespread debt forbearance actions during the COVID-19 pandemic. While the debt delinquency rates remained low, the rate of debt forbearance that allowed households to temporarily suspend loan repayment increased dramatically following the CARES Act, providing households with significant financial relief. Between March 2020 and May 2021, 6.3 million mortgages ($1.4 trillion), 11 million auto loans ($198 billion), 68 million student loans ($655 billion), and 62 million revolving loans ($125 billion) were in forbearance. We find that the debt relief reached its intended target, since forbearance rates are higher in regions with the highest COVID-19 infection rates and the greatest local economic deterioration. Individuals with lower credit scores, lower incomes, and higher debt balances and regions with higher shares of minorities received higher rates of forbearance. Conditional on being in forbearance, borrowers with higher prepandemic income received the largest dollar amount of relief per individual. Forbearance actions, therefore, complemented other income-based policy measures, providing more than half of aggregate forbearance relief to individuals who were ineligible for policies like stimulus checks.

Not all of the forbearance was mandated under the CARES Act. The private sector provided substantial debt forbearance in segments (auto debt, revolving debt, and jumbo mortgages) outside of explicit government mandates. Moreover, allowing borrowers a choice of whether to request debt relief might have resulted in a potentially better-targeted policy.

We find that borrowers in forbearance are left with a forbearance overhang of about $60 billion in accumulated postponed repayments. This forbearance debt overhang amounts to about $3,900 per individual, which is about 1.5 times their average monthly income, and more than 2.2 times for lower income borrowers. For mortgage borrowers, the estimated forbearance debt overhang is about $15 billion, amounting to about $14,200 per individual (about 3.4 times their average monthly income). The extent of forbearance overhang suggests that the unwinding of forbearance—which

22. Federal Reserve Bank of St. Louis, FRED, "30-Year Fixed Rate Mortgage Average in the United States," https://fred.stlouisfed.org/series/MORTGAGE30US.

could be done in several ways—could have first-order consequences for household debt distress and, through it, for the aggregate economy.

Our findings suggest that massive consumer debt forbearance actions can help explain why, unlike during the Great Recession, the standard household debt distress channel was largely absent during the first year of the COVID-19 pandemic. There are several possible reasons for quicker and more widespread implementation of debt relief during the COVID-19 pandemic relative to the Great Recession. First, the private sector and policymakers may have internalized the lessons from the Great Recession pointing to significant costs of widespread defaults and foreclosures and were more willing to provide debt relief.

Second, it is possible that the underlying adverse shock has been perceived as more transitory relative to the prior crisis, which could promote a more widespread deployment of temporary debt relief measures by the private sector. This is consistent with the consumer debt design literature that indicates that lenders should provide a certain amount of debt relief during economic downturns to limit deadweight costs of default and allow better risk-sharing between borrowers and lenders, especially if the underlying shocks are transitory. Relatedly, the COVID-19 shock is a rare aggregate exogenous shock that is largely outside of the agents' influence. This should also alleviate concerns about the moral hazard effects of debt relief on incentives to repay debt, leading to a more widespread loan renegotiation effort.

Finally, the nature of financial intermediation has significantly changed since the last crisis. Prior to the Great Recession most of the riskiest consumer debt, the so-called subprime mortgages, was not retained on the balance sheets of intermediaries and instead was sold through securitization to third parties (Mian and Sufi 2009; Mayer, Pence, and Sherlund 2009; Keys and others 2010, 2013). In contrast, the private securitization market was very limited even prior to the COVID-19 pandemic, and lenders retained the majority of jumbo (non-GSE) mortgages on their balance sheets (Buchak and others 2020). As a result, the lenders may have more economic incentives to undertake voluntary debt relief actions on these loans, even though these fall outside explicit government mandates.

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Appendix

Table A1: Mortgage and Borrower Characteristics in Equifax and Fannie Mae Datasets

This table compares mortgage and borrower characteristics in the Equifax and Fannie Mae Single Family Performance datasets from March 2020 to December 2020. The table shows means and standard deviations (in brackets) for loan balances, consumer credit scores, and forbearance rates. Note that the credit scores reported in the Fannie Mae dataset are FICO scores, while the scores reported in the Equifax dataset are Vantage scores. Forbearance rate refers to the percent of loans in forbearance for at least one month during the pandemic. *Sources*: Equifax and Fannie Mae Single-Family Historical Loan Performance Data.

	Fannie Mae Data			Equifax Data		
	Full Sample	In Forbearance	Not in Forbearance	Full Sample	In Forbearance	Not in Forbearance
Balance	174,564	219,522	169,711	179,012	224,738	177,582
	[112,401]	[126,152]	[111,196]	[120,888]	[133,973]	[119,080]
Credit Score	752	723	753	759	734	762
	[98]	[104]	[98]	[80]	[90]	[77]
Forbearance Rate	7.10%	1.00%	0.00%	5.20%	1.00%	0.00%

Table A2: Mortgage Borrowers: Descriptive Statistics

This table shows summary statistics for all mortgage borrowers in the Equifax dataset (Columns (1) through (4)) and all borrowers who are in forbearance on their mortgages (Columns (5) through (8)). Pre-COVID-19 statistics are based on January and February 2020, while COVID-19 statistics are based on March 2020 to May 2021. Odd columns contain means while even columns contain standard deviations. *Sources:* Equifax 10% representative sample of the U.S. credit population.

	Mortgage Borrowers				Mortgage Borrowers in Forbearance			
	Pre-COVID		COVID		Pre-COVID		COVID	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Vantage	732	95	738	93	656	133	675	101
Estimated Age	50	14	50	14	49	14	47	13
Estimated Income	53,867	20,162	53,177	20,304	51,131	20,799	50,615	20,101
Fraction with First Mortgage	1.00		1.00		1.00		1.00	
Fraction with Auto Debt	0.50		0.49		0.49		0.51	
Fraction with Revolving Debt	0.91		0.81		0.82		0.85	
Fraction Student Debt	0.14		0.14		0.16		0.19	
Average First Mortgage Balance (Nonzero Accounts)	210,020	240,631	217,585	247,220	292,910	401,836	268,789	301,460.
Average Combined Mortgage Balance (Nonzero Accounts)	211,549	242,103	219,004	248,621	294,797	402,919	270,732	303,401
Average Auto Debt (Nonzero Accounts)	215,97	20,640	22,140	21,012	221,60	21,836	24,442	23,067
Average Revolving Debt (Nonzero Accounts)	7,717	11,862	7,393	11,533	7,471	13,390	10,449	14,906
Average Student Debt (Nonzero Accounts)	40,589	56,288	41,941	57,493	46,536	61,293	49,254	64,311
Average Credit Card Utilization	28%		26%		42%		43%	
Average Available Credit	24,955	27,555	25,450	27,847	19,984	36,292	18,904	26,894
Number of Consumers	4,549,218		4,881,839		41,796		595,918	

Table A3: Share of Financial Relief due to Debt Forbearance Allocated to above Median Income Borrowers [continued]

This table shows the percentage of dollar amount financial relief due to debt forbearance went to above median income borrowers along with the associated total $ amount of payments missed from March 2020 to May 2021. Panel (c1) shows similar statistics but based on the median income of all individuals in our dataset. Panel (c2) shows median income of borrowers within a given debt type. Column (1) show results for first mortgages, Columns (2) for auto loans, Column (3) for revolving accounts, and Column (4) for student loans. *Sources:* Equifax 10% representative sample of the U.S. credit population.

Panel (a): Share of financial relief due to debt forbearance allocated to above median income borrowers (all consumers)

	Mortgages	Auto Debt	Revolving Debt	Student Debt
	(1)	(2)	(3)	(4)
Median Income		37,000		
% of Missed Payments from Above Median	72%	49%	47%	34%
Total Amount Missed from Above Median	22 Billion	2.8 Billion	2.2 Billion	15 Billion

Panel (b): Share of financial relief due to debt forbearance allocated to above median income borrowers (within each debt type)

	Mortgages	Auto Debt	Revolving Debt	Student Debt
	(1)	(2)	(3)	(4)
Median Income	52,000	41,000	37,000	22,000
% of Missed Payments from Above Median	46.0%	39%	47%	67%
Total Amount Missed from Above Median	14 Billion	2.2 Billion	2.2 Billion	30 Billion

Table A4: Individual-Level Forbearance Regressions

This table reports the results from a regression of whether an individual is in forbearance or whether an individual missed their payment while in forbearance on various borrower and zip code level variables. Months include March 2020 to May 2021. Columns (1) and (2) are estimated from all individuals with first mortgages, while Columns (3) and (4) are restricted to individuals who are in forbearance on their first mortgages. Columns (1) and (3) contain individual-level characteristics and zip code fixed effects, while columns (2) and (4) contain individual level controls and zip code controls. Zip code controls include zip code racial composition, educational attainment, unemployment rate, median age, median income, average CLTV, average DTI, and median house price. Regression inputs are scaled by standard deviation. Individual controls are taken as of January 2020. *Sources:* Forbearance status, missed payment status, and all other individual-level characteristics come from Equifax. House price data comes from Zillow. The remaining variables come from the U.S. Census Bureau American Community Survey 5-Year Estimates.

Panel A: Auto Debt

	(1) In Forbearance	(2) In Forbearance	(3) Missed Payment	(4) Missed Payment
Mortgage Balance	-0.00183	-0.000431	0.520***	0.542***
	(0.00381)	(0.00506)	(0.133)	(0.105)
Auto Loan Balance	0.509***	0.490***	-1.350***	-1.580***
	(0.00708)	(0.00650)	(0.147)	(0.0733)
Revolving Debt Balance	-0.0876***	-0.103***	-0.331***	-0.385***
	(0.00416)	(0.00534)	(0.0822)	(0.0767)
Student Loan Balance	-0.0614***	-0.0633***	-0.537***	-0.624***
	(0.00339)	(0.00429)	(0.0468)	(0.0595)
Small Business Owner	0.0608***	0.0664***	0.219***	0.221***
	(0.00349)	(0.00438)	(0.0417)	(0.0534)
Credit Score	-1.122***	-1.115***	-2.297***	-2.348***
	(0.00652)	(0.00849)	(0.0491)	(0.0593)
Income	0.0519***	0.0543***	-0.153	-0.178
	(0.00444)	(0.00545)	(0.120)	(0.104)
# Accounts Past Due in Jan.	0.216***	0.228***	0.175***	0.204***
	(0.00675)	(0.00912)	(0.0317)	(0.0430)
DTI	-0.00581	-0.00972	-0.623	-0.385
	(0.00339)	(0.00645)	(0.436)	(0.322)
Age	0.110***	0.113***	-0.714***	-0.747***
	(0.00392)	(0.00496)	(0.0505)	(0.0644)
Zip Code Controls	No	Yes	No	No
Zip Code FE	Yes	No	Yes	No
Mean of Dependent Variable	2.720	2.653	77.00	77.31
Observations	101,588,230	60,045,197	2,760,875	1,593,175
Adjusted R-squared	0.009	0.007	0.039	0.013

Table A4: Individual-Level Forbearance Regressions - [Continued]

Panel B: Revolving Debt

	(1) In Forbearance	(2) In Forbearance	(3) Missed Payment	(4) Missed Payment
Mortgage Balance	0.211***	0.217***	0.0409**	0.0145
	(0.0114)	(0.0144)	(0.0149)	(0.0206)
Auto Loan Balance	0.624***	0.625***	-0.732***	-1.005***
	(0.00977)	(0.0106)	(0.0212)	(0.0323)
Revolving Debt Balance	3.212***	3.149***	-1.144***	-1.109***
	(0.0181)	(0.0256)	(0.0270)	(0.0396)
Student Loan Balance	-0.0906***	-0.0946***	-0.324***	-0.320***
	(0.00548)	(0.00717)	(0.0190)	(0.0263)
Small Business Owner	0.119***	0.118***	0.573***	0.657***
	(0.00487)	(0.00621)	(0.0190)	(0.0259)
Credit Score	-2.063***	-2.065***	-2.538***	-2.692***
	(0.0117)	(0.0148)	(0.0315)	(0.0442)
Income	0.206***	0.162***	1.438***	1.360***
	(0.00902)	(0.0116)	(0.0269)	(0.0380)
# Accounts Past Due in Jan.	1.533***	1.587***	1.642***	1.743***
	(0.0158)	(0.0210)	(0.0247)	(0.0364)
DTI	0.0922***	0.0809**	-0.0407	-0.0845*
	(0.0230)	(0.0313)	(0.0266)	(0.0421)
Age	0.119***	0.139***	-0.818***	-0.571***
	(0.00751)	(0.00898)	(0.0306)	(0.0429)
Zip Code Controls	No	Yes	No	Yes
Zip Code FE	Yes	No	Yes	No
Mean of Dependent Variable	7.879	7.634	81.50	81.76
Observations	167,558,710	101,014,835	13,202,076	7,710,998
Adjusted R-squared	0.040	0.035	0.085	0.038

Table A4: Individual-Level Forbearance Regressions - [Continued]

Panel C: Student Debt

	(1) In Forbearance	(2) In Forbearance	(3) Missed Payment	(4) Missed Payment
Mortgage Balance	-1.339***	-1.331***	0.0537	0.0800*
	(0.150)	(0.179)	(0.0290)	(0.0367)
Auto Loan Balance	0.293***	0.307**	0.0678***	0.0606**
	(0.0826)	(0.0995)	(0.0164)	(0.0210)
Revolving Debt Balance	-0.868***	-0.900***	-0.00454	0.0112
	(0.0797)	(0.0961)	(0.0162)	(0.0207)
Student Loan Balance	4.266***	4.331***	1.075***	1.099***
	(0.0381)	(0.0464)	(0.00891)	(0.0115)
Small Business Owner	0.648***	0.665***	0.139***	0.144***
	(0.0181)	(0.0238)	(0.00970)	(0.0129)
Credit Score	-6.142***	-6.440***	-3.066***	-3.161***
	(0.0410)	(0.0519)	(0.0115)	(0.0149)
Income	-4.591***	-4.514***	-1.064***	-1.064***
	(0.117)	(0.141)	(0.0252)	(0.0323)
# Accounts Past Due in Jan.	-2.107***	-2.169***	-0.309***	-0.319***
	(0.0349)	(0.0451)	(0.00698)	(0.00880)
DTI	-1.013	-0.928	-0.143	-0.138
	(0.559)	(0.670)	(0.0848)	(0.107)
Age	-6.652***	-6.825***	-0.596***	-0.623***
	(0.0393)	(0.0487)	(0.0134)	(0.0177)
Zip Code Controls	No	Yes	No	No
Zip Code FE	Yes	No	Yes	No
Mean of Dependent Variable	82.75	82.36	95.65	95.54
Observations	51,954,418	30,627,628	42,992,471	25,225,023
Adjusted R-squared	0.140	0.136	0.035	0.030

Table A5: Zip-Code Socio-economic Characteristics Regressions

This table shows the results from regressions of average monthly forbearance rate and the percent of scheduled payments missed in each zip code on various zip code-level characteristics. Averages are taken from March 2020 to May 2021. Regression inputs are scaled by standard deviation. Analysis is restricted to zip codes with at least ten loans. *Sources:* Forbearance status, missed payment status, and all other individual-level characteristics come from Equifax. House price data comes from Zillow. The remaining variables come from the U.S. Census Bureau American Community Survey 5-Year Estimates.

Panel A: Auto Debt

	Forbearance Rate	Percent of Scheduled Payments Missed
	(1)	(2)
% College Educated	-0.0563***	-0.00518
	(0.0156)	(0.0113)
% Black	0.230***	0.130***
	(0.0114)	(0.00757)
% Hispanic	0.133***	0.135***
	(0.0114)	(0.00776)
Pre-Pandemic Unemployment Rate	0.0345*	0.0276*
	(0.0147)	(0.0118)
Median Age	-0.0492***	-0.00521
	(0.0121)	(0.00842)
Median Income	0.00908	0.0304*
	(0.0150)	(0.0150)
Average DTI	0.0884***	0.0697***
	(0.0131)	(0.0103)
Average House Price in January	-0.0563***	-0.00518
	(0.0156)	(0.0113)
Mean of Dependent Variable	2.182	1.269
# Of Obs.	18,500	18,500
R-Squared	0.0757	0.0585

Table A5: Zip-Code Socio-economic Characteristics Regressions – [Continued]

Panel B: Revolving Debt

	Forbearance Rate	Percent of Scheduled Payments Missed
	(1)	(2)
% College Educated	0.200***	0.0449***
	(0.0112)	(0.0132)
% Black	0.303***	0.111***
	(0.00836)	(0.00953)
% Hispanic	0.0791***	0.149***
	(0.00704)	(0.00978)
Pre-Pandemic Unemployment Rate	0.0240*	0.0533**
	(0.00937)	(0.0164)
Median Age	-0.0464***	0.00732
	(0.00848)	(0.0116)
Median Income	-0.0932***	-0.124***
	(0.0143)	(0.0175)
Average DTI	0.0479*	0.0236
	(0.0211)	(0.0202)
Average House Price in January	0.161***	0.0901***
	(0.0113)	(0.0104)
Mean of Dependent Variable	2.277	1.629
# Of Obs.	18,594	18,594
R-Squared	0.2111	0.0494

Table A5: Zip-Code Socio-economic Characteristics Regressions – [Continued]

Panel C: Student Debt

	Forbearance Rate	Percent of Scheduled Payments Missed
	(1)	(2)
% College Educated	-0.728***	-1.405***
	(0.0856)	(0.167)
% Black	1.490***	3.020***
	(0.0573)	(0.127)
% Hispanic	0.730***	1.530***
	(0.0667)	(0.128)
Pre-Pandemic Unemployment Rate	0.134	0.283
	(0.0969)	(0.176)
Median Age	-0.667***	-0.898***
	(0.0803)	(0.147)
Median Income	-1.190***	-2.993***
	(0.107)	(0.199)
Average DTI	-0.104	0.205
	(0.0759)	(0.185)
Average House Price in January	0.267***	1.034***
	(0.0697)	(0.136)
Mean of Dependent Variable	83.97	57.25
# Of Obs.	18,194	18,145
R-Squared	0.1341	0.1327

Table A6: Zip-Code Industry and Occupation Characteristic Regressions

This table shows the results from regressions of average monthly forbearance rates and the percent of scheduled payments missed in each zip code on various zip code-level characteristics. Averages are taken from March 2020 to May 2021. Regression inputs are scaled by standard deviation. Analysis is restricted to zip codes with at least ten loans. *Sources:* Forbearance status, missed payment status, and all other individual-level characteristics come from Equifax. The remaining variables come from the U.S. Census Bureau American Community Survey 5-Year Estimates.

Panel A: Mortgage Debt

	Forbearance Rate	Percent of Scheduled Payments Missed
	(1)	(2)
% Production Industry	0.104**	-0.00492
	(0.0382)	(0.0420)
% Agriculture Industry	-0.0695*	-0.152***
	(0.0351)	(0.0353)
% Finance, Insurance, Real Estate Industry	-0.0978**	-0.0632
	(0.0338)	(0.0402)
% Arts, Recreation, Entertainment Industry	-0.0140*	-0.00990
	(0.00676)	(0.00730)
% Education, Health, Public Administration Industry	-0.344***	-0.322***
	(0.0368)	(0.0414)
% Construction and Manufacturing Industry	-0.563***	-0.506***
	(0.0398)	(0.0457)
% Work From Home - Pre-Pandemic	-0.143***	-0.143***
	(0.0331)	(0.0348)
% Self -Employed - Pre-Pandemic	0.0400	-0.0106
	(0.0377)	(0.0369)
% Service Occupations	0.355***	0.284***
	(0.0332)	(0.0374)
% Sales and Office Occupations	0.0955**	0.0639
	(0.0315)	(0.0329)
Mean of Dependent Variable	4.186	3.078
# Of Obs.	23,084	23,084
R-Squared	0.0444	0.0288

Table A6: Zip-Code Industry and Occupation Characteristic Regressions - [continued]

Panel B: Auto Debt

	Forbearance Rate	Percent of Scheduled Payments Missed
	(1)	(2)
% Production Industry	0.135***	0.0380**
	(0.0168)	(0.0122)
% Agriculture Industry	-0.0221	-0.0550***
	(0.0142)	(0.0100)
% Finance, Insurance, Real Estate Industry	-0.0104	-0.0140
	(0.0141)	(0.0130)
% Arts, Recreation, Entertainment Industry	-0.00485	-0.00645**
	(0.00321)	(0.00201)
% Education, Health, Public Administration Industry	-0.0791***	-0.102***
	(0.0167)	(0.0103)
% Construction and Manufacturing Industry	-0.157***	-0.145***
	(0.0182)	(0.0132)
% Work From Home - Pre-Pandemic	-0.0783***	-0.0514***
	(0.0138)	(0.00967)
% Self -Employed - Pre-Pandemic	0.0430**	0.0195
	(0.0135)	(0.0110)
% Service Occupations	0.127***	0.0852***
	(0.0155)	(0.0112)
% Sales and Office Occupations	0.0268*	0.00762
	(0.0133)	(0.00934)
Mean of Dependent Variable	2.218	1.305
# Of Obs.	23,673	23,673
R-Squared	0.0276	0.0299

Table A6: Zip-Code Industry and Occupation Characteristic Regressions - [continued]

Panel C: Revolving Debt

	Forbearance Rate	Percent of Scheduled Payments Missed
	(1)	(2)
% Production Industry	0.0321**	0.0419**
	(0.0118)	(0.0160)
% Agriculture Industry	-0.165***	-0.0937***
	(0.00908)	(0.0139)
% Finance, Insurance, Real Estate Industry	0.0623***	-0.0247*
	(0.0125)	(0.0124)
% Arts, Recreation, Entertainment Industry	0.00443*	-0.000664
	(0.00217)	(0.00271)
% Education, Health, Public Administration Industry	-0.0354**	-0.0981***
	(0.0135)	(0.0145)
% Construction and Manufacturing Industry	-0.276***	-0.141***
	(0.0130)	(0.0165)
% Work From Home - Pre-Pandemic	0.00110	-0.0481*
	(0.0124)	(0.0189)
% Self -Employed - Pre-Pandemic	-0.0318**	0.0331
	(0.0111)	(0.0275)
% Service Occupations	-0.00458	0.0600***
	(0.0111)	(0.0130)
% Sales and Office Occupations	-0.0596***	0.00958
	(0.0118)	(0.0124)
Mean of Dependent Variable	2.277	1.629
# Of Obs.	23,836	23,836
R-Squared	0.1162	0.0258

Table A6: Zip-Code Industry and Occupation Characteristic Regressions - [continued]

Panel D: Student Debt

	Forbearance Rate	Percent of Scheduled Payments Missed
	(1)	(2)
% Production Industry	0.173***	0.0531***
	(0.0169)	(0.0122)
% Agriculture Industry	-0.0288	-0.0610***
	(0.0148)	(0.0104)
% Finance, Insurance, Real Estate Industry	0.00549	-0.0212
	0.00549	-0.0212
% Arts, Recreation, Entertainment Industry	-0.00580	-0.00882***
	(0.00302)	(0.00202)
% Education, Health, Public Administration Industry	-0.0993***	-0.119***
	(0.0148)	(0.0107)
% Construction and Manufacturing Industry	-0.208***	-0.177***
	(0.0172)	(0.0129)
% Work From Home - Pre-Pandemic	-0.0715***	-0.0518***
	(0.0148)	(0.0103)
% Self -Employed - Pre-Pandemic	0.0476***	0.0196
	(0.0141)	(0.0119)
% Service Occupations	0.155***	0.101***
	(0.0142)	(0.0101)
% Sales and Office Occupations	0.0244	0.00593
	(0.0127)	(0.00971)
Mean of Dependent Variable	84.25	57.65
# Of Obs.	23,294	23,230
R-Squared	0.0753	0.0696

Table A7: Forbearance Rates, Unemployment Claims, and COVID Infections

This table shows the results from regressions of average monthly forbearance rates and the percent of scheduled payments missed in each county on various county-level characteristics. Averages are taken over the period from March 2020 to May 2021 and percent of scheduled payments missed by individuals in forbearance is calculated over the same time period. Regression inputs are scaled by standard deviation. Analysis is restricted to counties with at least ten loans. *Sources:* Forbearance status and missed payment status come from Equifax. UI claims, COVID cases, credit/debit card spending, and time spent at workplace are averages of March 2020 to May 2021 values from Opportunity Insights Tracker. Remaining variables are calculated using data from the U.S. Census Bureau American Community Survey 5-Year Estimates.

Panel A: Auto Debt

	Forbearance Rate	Percent of Scheduled Payments Missed
	(1)	(2)
Total UI Claims	0.167***	0.0865***
	(0.0235)	(0.0143)
Total COVID Case Rate	0.159***	0.0915***
	(0.0241)	(0.0147)
Change in Credit/Debit Spending	-0.0305	-0.0240
	(0.0234)	(0.0142)
Change in Time Spent at Workplace	-0.129**	-0.101***
	(0.0394)	(0.0240)
% Families Receiving Full Stimulus Check	0.0332	-0.000662
	(0.0383)	(0.0234)
% Workers in at Risk Industry	0.0566	0.0532*
	(0.0421)	(0.0257)
Amount of PPP Received Normalized by # of Small Businesses	-0.0197	-0.0982*
	(0.0699)	(0.0426)
Mean of Dependent Variable	2.117	1.281
# Of Obs.	364	364
R-Squared	0.2360	0.2595

Table A7: Forbearance Rates, Unemployment Claims, and COVID Infections – [Continued]

Panel B: Revolving Debt

	Forbearance Rate	Percent of Scheduled Payments Missed
	(1)	(2)
Total UI Claims	0.147***	0.121***
	(0.0324)	(0.0133)
Total COVID Case Rate	0.0985**	0.0252
	(0.0333)	(0.0137)
Change in Credit/Debit Spending	-0.0181	0.0102
	(0.0329)	(0.0135)
Change in Time Spent at Workplace	-0.215***	-0.0569**
	(0.0468)	(0.0192)
% Families Receiving Full Stimulus Check	0.0444	-0.0259
	(0.0447)	(0.0184)
% Workers in at Risk Industry	0.0980	0.0443*
	(0.0522)	(0.0214)
Amount of PPP Received Normalized by # of Small Businesses	-0.186*	-0.174***
	(0.0906)	(0.0372)
Mean of Dependent Variable	2.318	1.642
# Of Obs.	349	349
R-Squared	0.1563	0.3052

Table A7: Forbearance Rates, Unemployment Claims, and COVID Infections – [Continued]

Panel C: Student Debt

	Forbearance Rate	Percent of Scheduled Payments Missed
	(1)	(2)
Total UI Claims	1.462***	3.323***
	(0.120)	(0.256)
Total COVID Case Rate	0.727***	1.359***
	(0.123)	(0.263)
Change in Credit/Debit Spending	0.156	0.295
	(0.119)	(0.254)
Change in Time Spent at Workplace	-0.229	-1.432***
	(0.201)	(0.428)
% Families Receiving Full Stimulus Check	0.539**	1.456***
	(0.196)	(0.416)
% Workers in at Risk Industry	0.310	0.606
	(0.215)	(0.457)
Amount of PPP Received Normalized by # of Small Businesses	0.213	-0.0128
	(0.357)	(0.760)
Mean of Dependent Variable	84.53	57.38
# Of Obs.	364	364
R-Squared	0.3972	0.3929

Table A8: Missing Defaults Rate and Regional Characteristics

This table shows the results from regressions of the missing defaults in each zip code on various zip code-level characteristics. Missing defaults rate is the difference between the loan-level model predicted delinquency rate and the actual delinquency rate from April 2020 to May 2021. Regression inputs are scaled by standard deviation. *Sources:* outcome variables are constructed using data from Equifax. The remaining variables come from the U.S. Census Bureau American Community Survey 5-Year Estimates.

Panel A: Missing Defaults and Local Demographics

Credit Score	-0.69***
	(0.03)
Minority Share	0.28***
	(0.02)
Percent Below Poverty	0.09***
	(0.03)
Ln(Median Income)	0.36***
	(0.03)
Share with College Education	-0.38***
	(0.03)
# Of Obs.	17746
R-Squared	0.02

Panel B: Missing Defaults and Local Industry and Occupation Characteristics

%Service Occupations	0.07***
	(0.00)
%Self Employed	-0.03***
	(0.00)
%Work from Home	-0.03***
	(0.01)
%Education, Health, Public Administration	-0.01***
	(0.00)
%Production	0.05***
	(0.00)
%Agriculture	-0.01***
	(0.00)
%Finance, Insurance, Real Estate	-0.04***
	(0.01)
%Art, Recreation, Entertainment	-0.02***
	(0.00)
%Construction and Manufacturing	-0.04***
	(0.00)
%Sales and Office Occupations	0.04***
	(0.00)
# Of Obs.	22458
R-Squared	0.04

Table A9: Government Mandates and Forbearance: Unemployment Claims, COVID-19 Infections, and Other Stimulus

This table shows the results from regressions of the average monthly mortgage forbearance rate and the percent of scheduled payments missed in each zip code on various county-level characteristics for both jumbo mortgages and conforming mortgages. Averages are taken over the period from March 2020 to May 2021 and percent of scheduled payments missed by individuals in forbearance is calculated over the same time period. The first two columns show results based off of jumbo loans and the final two columns show results for conforming loans. Our analysis is restricted to loans that fall within 90% to 110% of the conforming loan limit. Jumbo loans are loans that fall above 100% of the conforming loan limit and are not covered by forbearance mandates under the CARES Act (are not Fannie, Freddie, VA, or FHA loans). Conventional loans are Fannie and Freddie loans that fall below 100% of the conforming loan limit. Regression inputs are scaled by standard deviation. Analysis is restricted to counties with at least ten loans. *Sources:* Forbearance status and missed payment status come from Equifax. UI claims, COVID cases, credit/debit card spending, and time spent at workplace are averages of March 2020 to May 2021 values from Opportunity Insights Tracker. Remaining variables are calculated using data from the U.S. Census Bureau American Community Survey 5-Year Estimates.

	Jumbo Loans		Conforming Loans	
	Forbearance Rate	Percent of Scheduled Payments Missed	Forbearance Rate	Percent of Scheduled Payments Missed
	(1)	(2)	(3)	(4)
Total UI Claims	0.394	0.223	0.765***	0.515**
	(0.201)	(0.140)	(0.212)	(0.169)
Total COVID Case Rate	0.325	0.164	0.0360	-0.0839
	(0.207)	(0.144)	(0.218)	(0.173)
Change in Credit/Debit Spending	0.328	0.290*	0.170	0.285
	(0.204)	(0.142)	(0.216)	(0.171)
Change in Time Spent at Workplace	-0.475	-0.331	-0.942**	-0.632*
	(0.291)	(0.202)	(0.314)	(0.250)
% Families Receiving Full Stimulus Check	-0.780**	-0.663***	-0.620*	-0.486*
	(0.278)	(0.193)	(0.298)	(0.237)
% Workers in at Risk Industry	1.111***	0.864***	0.111	0.0761
	(0.324)	(0.225)	(0.349)	(0.277)
Amount of PPP Received Normalized by # of Small Businesses	-0.911	-0.224	-0.685	-0.878
	(0.563)	(0.391)	(0.649)	(0.515)
Mean of Dependent Variable	2.875	1.667	4.124	2.689
# Of Obs.	349	349	349	349
R-Squared	0.1043	0.1140	0.1471	0.1316

Table A10: Diff-and-diff Analysis: Government Mandates, Mortgage Forbearance, and Missing Defaults

Column (1)-(2) of Panel (c) of this table shows results from regressions of the form:

$$Forbearance_{i,t,z} = \alpha + \beta_1 Conforming_{i,z} + \beta_2 Pandemic_t + \beta_3 Pandemic_t * Conforming_{i,z} + \gamma X_{i.z} + \theta Z_z + \varepsilon_{i,t,z}$$

where $Forbearance_{i,t,z}$ is an indicator for whether loan i located in zip code z is in forbearance during month t. $Conforming_{i,z}$ is an indicator for whether the loan is a conforming mortgage, $Pandemic_t$ is an indicator that takes on the value of zero prior to March 2020 and one from March 2020 to May 2021, $X_{i,z}$ is a vector of borrower level characteristics, and Z_z is either a vector of zip code controls or fixed effects. Column (3)-(4) show the corresponding results for the delinquency rate. We restrict our analysis to mortgages with balances that fall within 70% to 130% of the conforming loan limit. Jumbo loans are loans that fall above 100% of the conforming loan limit and are not covered by forbearance mandates under the CARES Act. Conforming loans are Fannie and Freddie mortgages that fall below 100% of the conforming loan limit. Standard errors are clustered at the loan level. Borrower level controls include student debt balance, auto debt balance, revolving debt balance, age, income, credit score, DTI, number of accounts past due, and small business owner. Zip code controls include zip code racial composition, educational attainment, unemployment rate, median age, median income, average CLTV, average DTI, and median house price. Regression inputs are scaled by standard deviation. Borrower control variables are taken as of January 2020. Months include January 2019 to May 2021. *Sources:* Forbearance status, missed payment status, and all other individual-level characteristics come from Equifax. House price data comes from Zillow. The remaining variables come from the U.S. Census Bureau American Community Survey 5-Year Estimates.

	Forbearance Rate		% Missing Payments	
	(1)	(2)	(3)	(4)
Conforming × Pandemic	1.714***	1.658***	-0.0986**	-0.129**
	(0.0644)	(0.0795)	(0.0360)	(0.0428)
Pandemic	4.431***	4.201***	-0.302***	-0.248***
	(0.0572)	(0.0703)	(0.0329)	(0.0390)
Conforming	-0.210***	-0.264***	-0.404***	-0.385***
	(0.0250)	(0.0289)	(0.0428)	(0.0521)
Borrower Controls	Yes	Yes	Yes	Yes
Zip Code Controls	No	Yes	No	Yes
Zip Code FE	Yes	No	Yes	No
Observations	11,348,033	6,883,736	11,649,795	7,067,207
Adjusted R-squared	0.067	0.053	0.203	0.187

Table A11: Characteristics of Mortgages in Forbearance

This table shows characteristics of mortgages in forbearance and not in forbearance among GSE loans and FHA backed loans. Source: Loan-level data from GSEs (Fannie Mae and Freddie Mac) and from Ginnie Mae (FHA loans).

	GSE Loans		FHA Loans	
	Forbearance	Not in Forbearance	Forbearance	Not in Forbearance
Interest Rate	4.4	4.18	4.25	4.17
Balance	223,185	189,553	188,118	184,467
Months to Maturity	281	257	304	295
LTV at Origination	77.3	72.9	94.7	93.6

Figure A1: Consumer Debt Outstanding in Trillions of Dollars

This figure plots the total outstanding debt in the United States from the first quarter 2006 to the first quarter of 2021. Amounts are in trillions of dollars. Debt types include mortgages, auto loans, revolving loans, and student loans. *Source:* Equifax data.

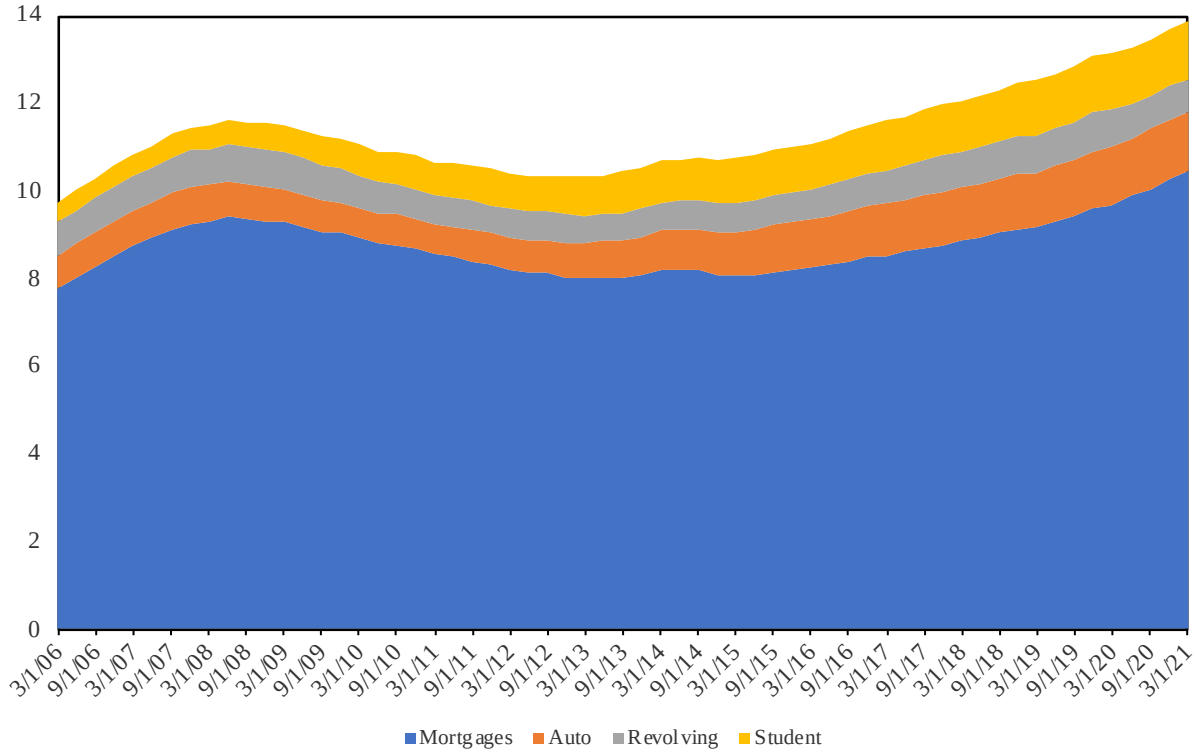


Figure A2: Forbearance Rates in Equifax and Fannie Mae Datasets

This figure compares forbearance rates in the Equifax and Fannie Mae Single-Family Historical Loan Performance Data. For this comparison, we focus only on Equifax loans labeled as GSE loans. We focus on the period from March 2020 to December 2020 due to data limitations in the Fannie Mae dataset. *Sources*: Equifax and Fannie Mae Single-Family Historical Loan Performance Data

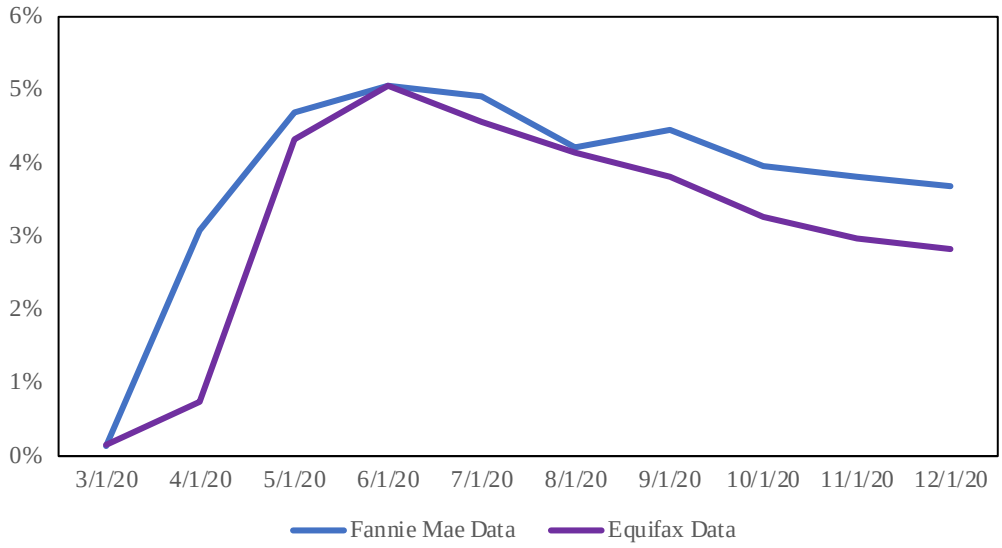


Figure A3: Initial Policy Response to COVID-19

This figure shows the number of new daily COVID cases in the United States from January 2020 to July 2020 plotted against major policy events of the pandemic.

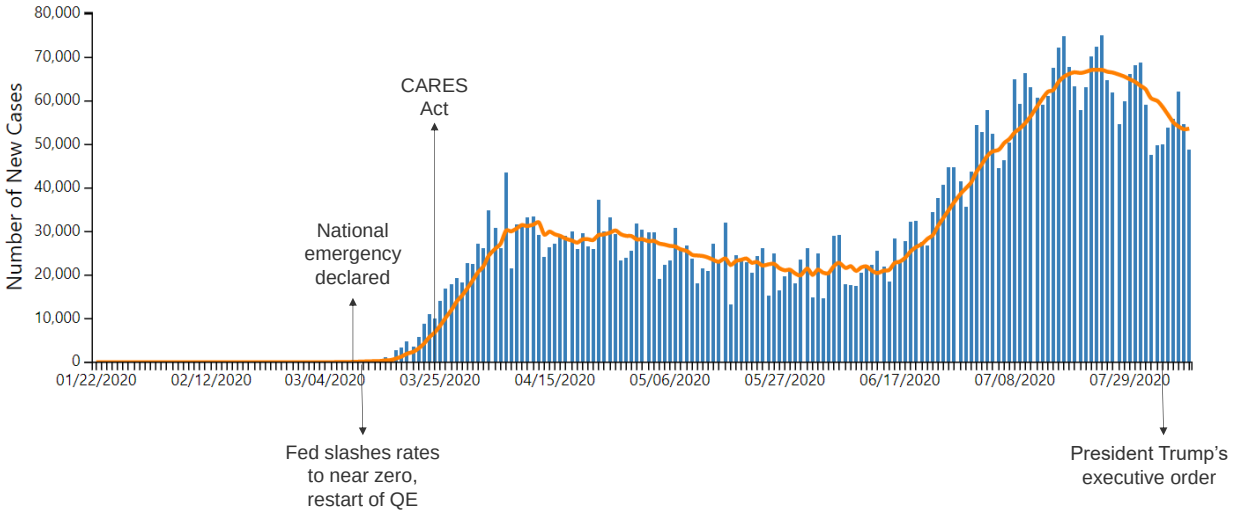


Figure A4: Default Model Fit: Actual and Predicted Mortgage Delinquency Rate

This figure compares the actual mortgage delinquency rate (30+day) and the model predicted delinquency rate from 2007 to 2017. The model is estimated using 10 percent random sample of US credit population from Equifax data from 2007 to 2017. Predictors include unemployment rate, house price changes, borrower credit score, LTV, DTI, the squared terms, and their interactions with unemployment rate and house price changes.

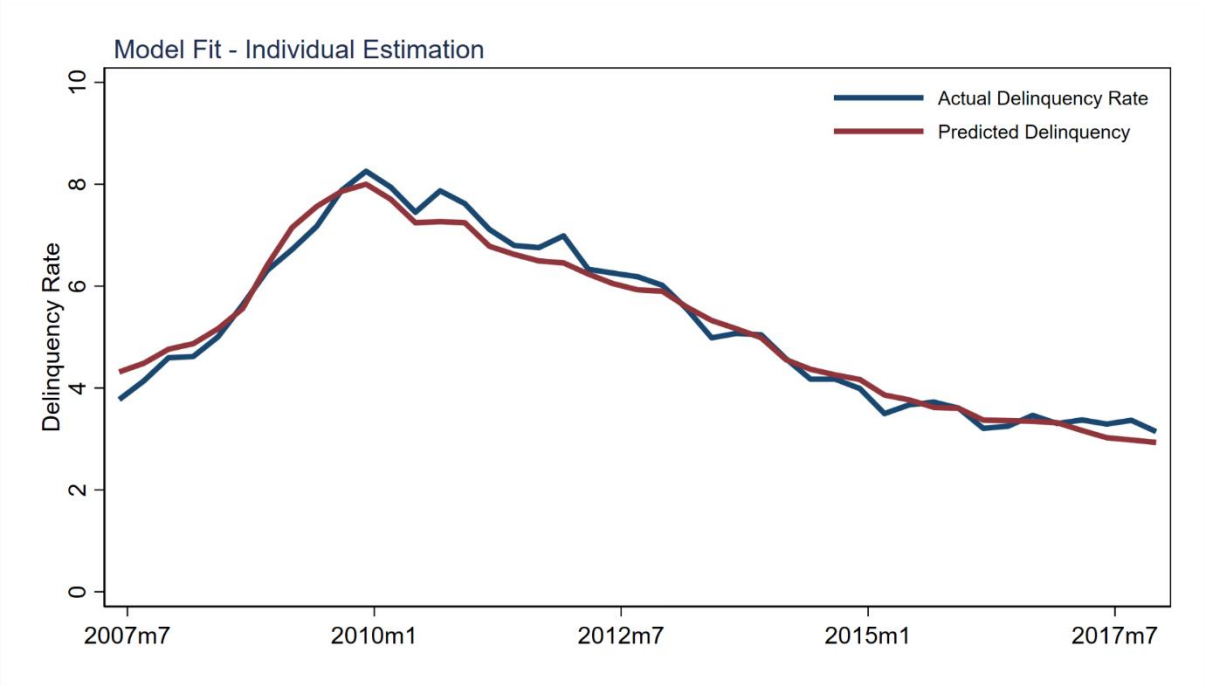
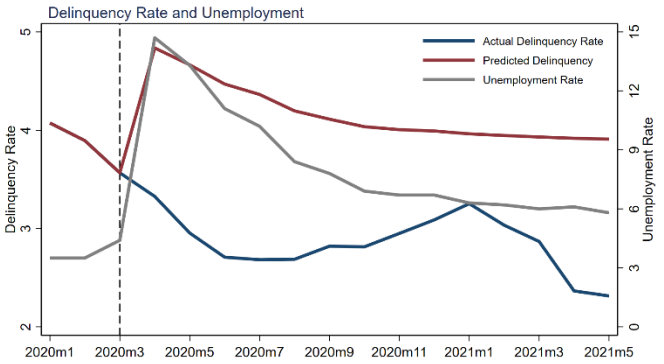
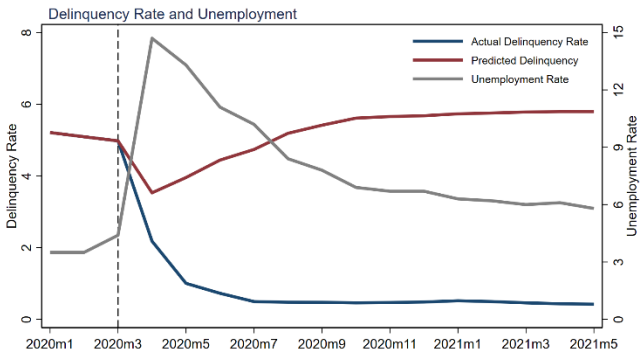


Figure A5: Counterfactual Auto Loan, Student Loan, and Revolving Loan Defaults and Actual Defaults

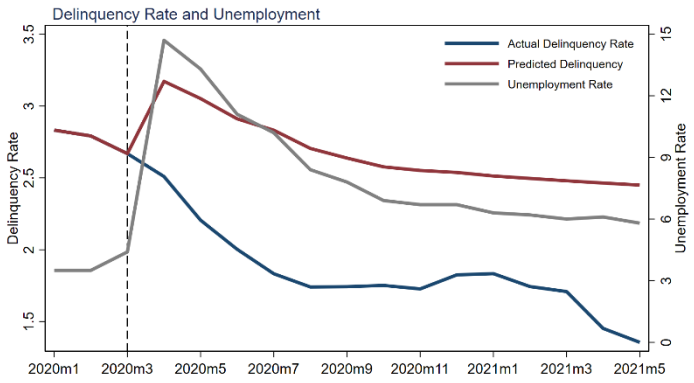
Panel (a) of this figure compares the model predicted auto loan delinquency rate and the actual delinquency rate along with the unemployment rate. Panel (b) of this figure compares the model predicted student loan delinquency rate and the actual delinquency rate along with the unemployment rate. Panel (c) of this figure compares the model predicted revolving loan delinquency rate and the actual delinquency rate along with the unemployment rate. The Model is estimated using monthly zip-level data from 2006 to 2010. The dashed vertical line shows the declaration of the national emergency due to COVID-19 and the passage of the CARES Act in March 2020. The quarterly unemployment rates are form the US Bureau of Labor Statistics and are peak values in a respective quarter. *Sources:* Equifax 10% representative sample of the U.S. credit population.



(a) Auto Loan



(b) Student Loan



(c) Revolving Loan

Figure A6: Forbearance and Missed Payment Rates by Income, Credit Scores, and Age

This figure plots first mortgage forbearance rates and missed payment rates by income, credit score, and age. Panel (a) shows first mortgages, panel (b) shows auto loans, panel (c) shows revolving loans, and panel (d) shows student loans. The left column plot forbearance rates by income quantiles. The center column plots similar results by credit scores and the right column by age groups. Income, credit scores, and age are taken as of January 2020. Months include March 2020 to May 2021. *Sources:* Equifax 10% representative sample of the U.S. credit population.

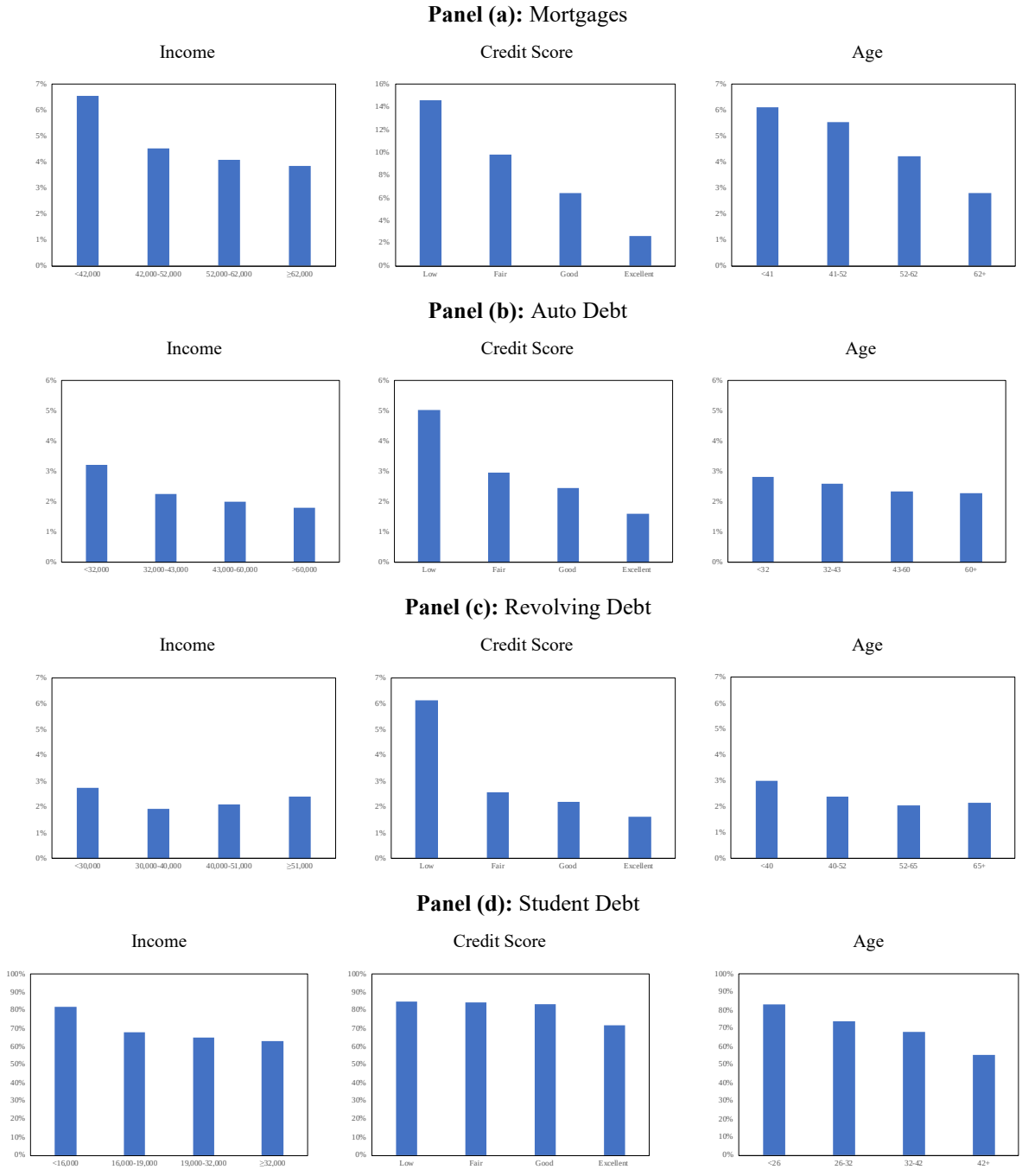
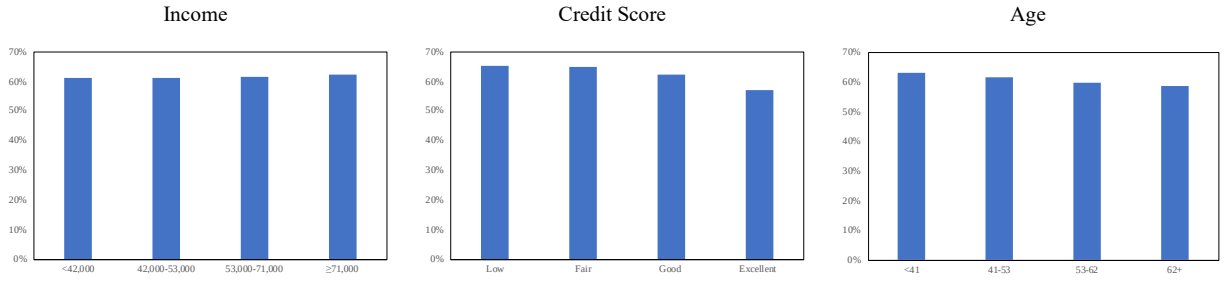


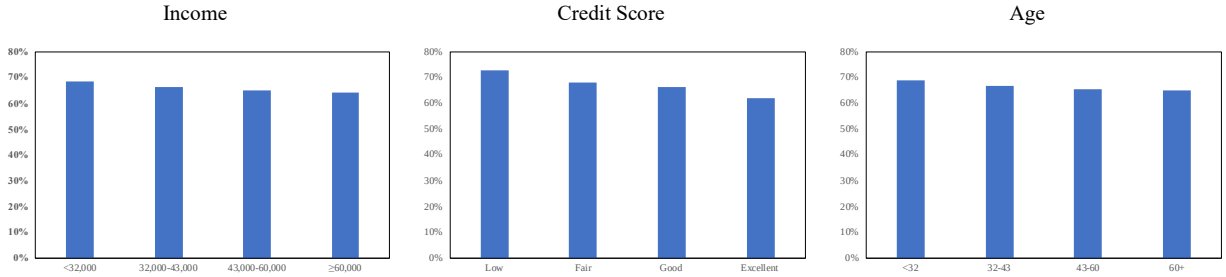
Figure A7: Percent of Scheduled Payments Missed by Income, Credit Scores, and Age

This figure plots the percent of scheduled payments missed due to forbearance by income, credit score, and age. Panel (a) shows first mortgages, panel (b) shows auto loans, panel (c) shows revolving loans, and panel (d) shows student loans. The figures show both the averages for each quantile based on income and age, and for each credit score group. The left column plots by income quantiles, the center column by credit score quantiles, and the right column by age quantiles. Income, credit score, and age are taken as of January 2020. Months include March 2020 to May 2021. *Sources:* Equifax 10% representative sample of the U.S. credit population.

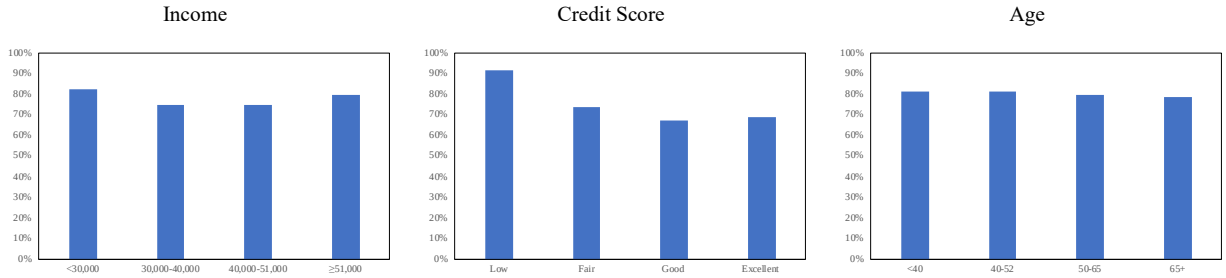
Panel (a): Mortgages



Panel (b): Auto Debt



Panel (c): Revolving Debt



Panel (d): Student Debt

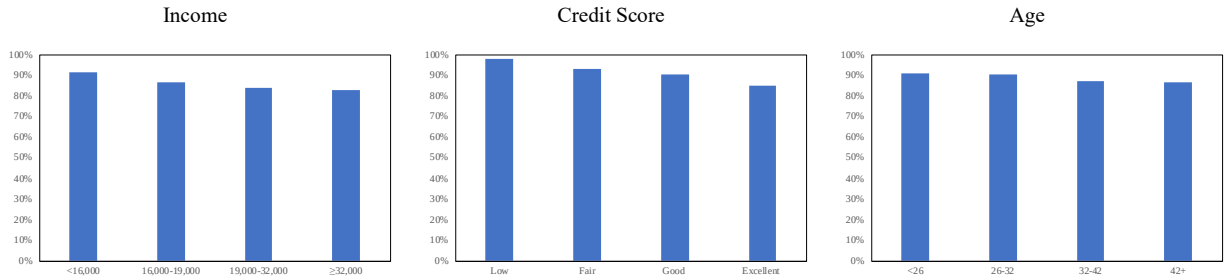
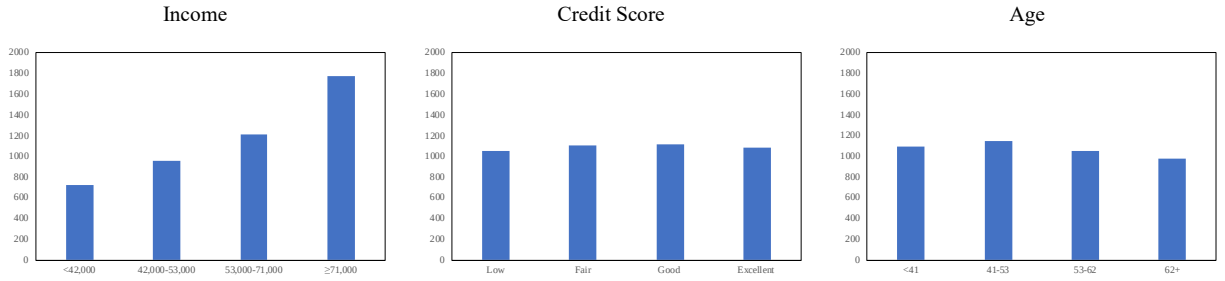


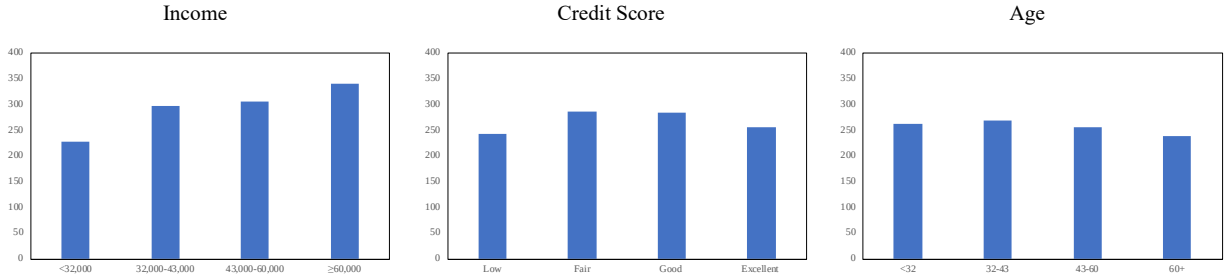
Figure A8: Missed Monthly Payment Amounts by Income, Credit Scores, and Age

This figure plots the monthly dollar amount of payments missed due to forbearance by income, credit score, and age. Panel (a) shows first mortgages, panel (b) shows auto loans, panel (c) shows revolving loans, and panel (d) shows student loans. The figures show both the averages for each quintile based on income and age, and for each credit score group. The left column plots by income quantiles, the center column by credit score quantiles, and the right column by age quantiles. Income, credit score, and age are taken as of January 2020. Months include March 2020 to May 2021. *Sources:* Equifax 10% representative sample of the U.S. credit population.

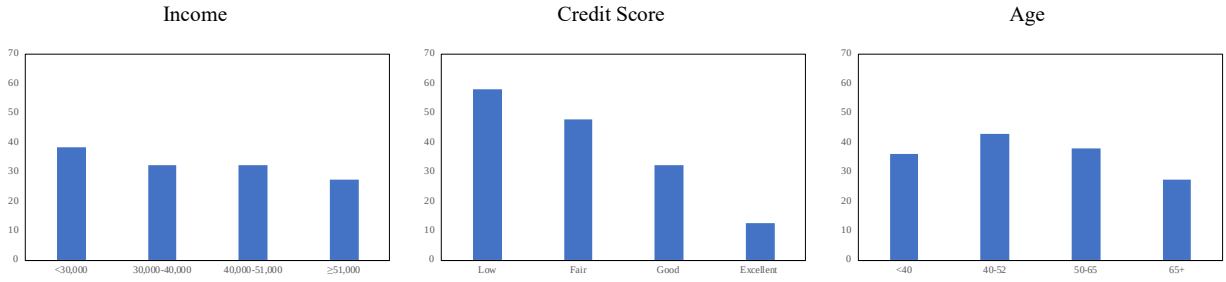
Panel (a): Mortgages



Panel (b): Auto Debt



Panel (c): Revolving Debt



Panel (d): Student Debt

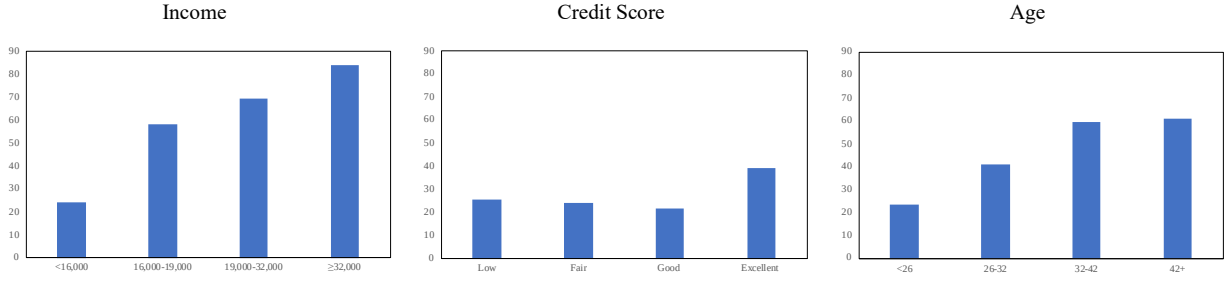
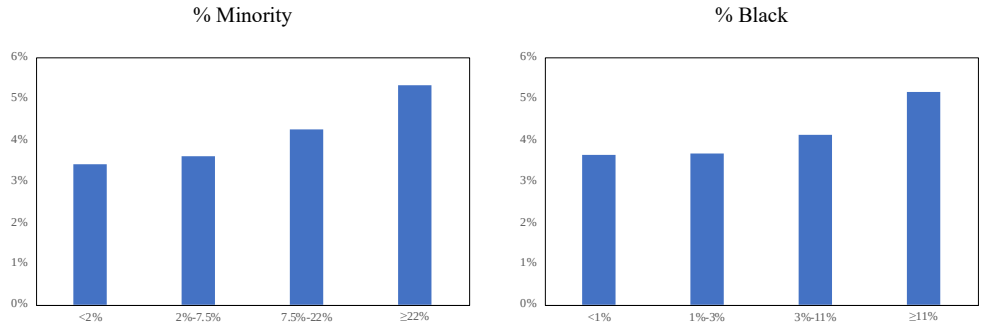


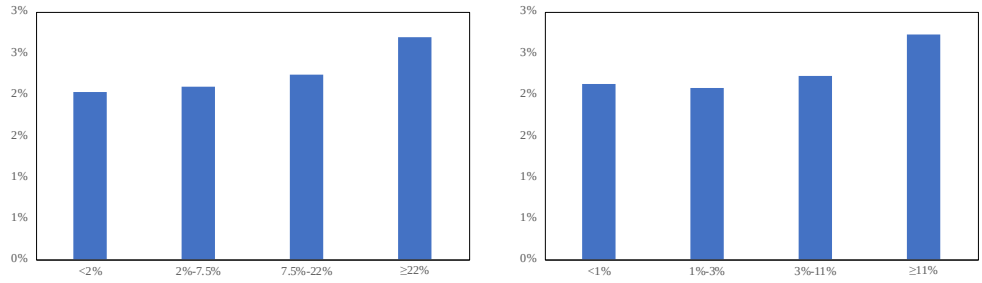
Figure A9: Regional Evidence: Forbearance Rates based on % Minority and % Black

This figure plots the average monthly forbearance rates for zip codes. Average monthly forbearance rates are taken from March 2020 to May 2021. Plots are based on the percent of a zip code's population that is a minority (non-white) and the percent of a zip code's population that is Black. Panel (a) shows first mortgage forbearance rates, panel (b) shows auto loans, panel (c) shows revolving loans, and panel (d) shows student loans. The left column plots by income quantile, the middle column by percent minority quantile, and the right column by pre-pandemic unemployment rate quantile. We restrict to zip codes with at least ten loans. *Sources:* Equifax and U.S. Census Bureau's ACS.

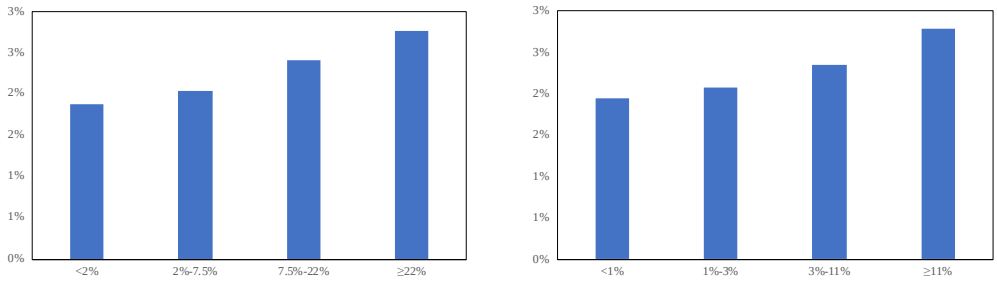
Panel (a): Mortgages



Panel (b): Auto Debt



Panel (c): Revolving Debt



Panel (d): Student Debt

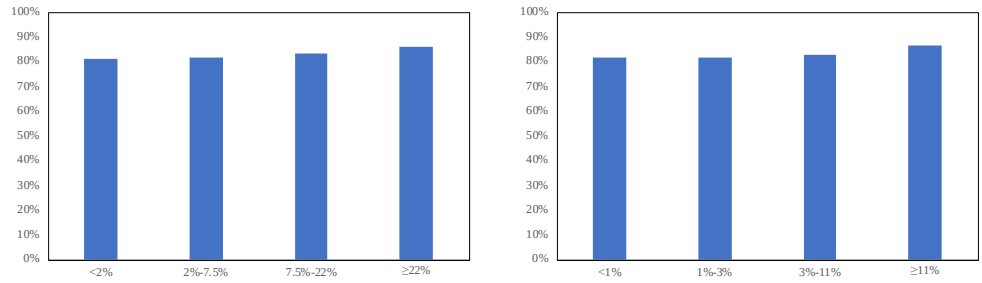
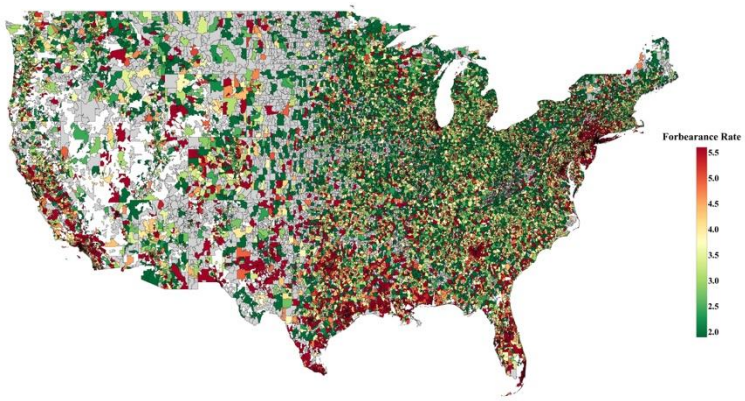


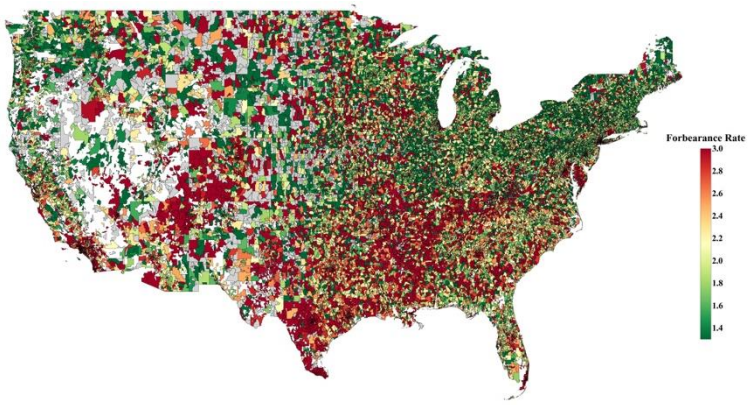
Figure A10: Geographical Heterogeneity in Forbearance Rates

This figure shows heterogeneity in average monthly forbearance rates across zip codes. For each debt type, we limit maps to zip codes with at least ten loans. Average monthly forbearance rates are taken from March 2020 to May 2021. Panel (a) shows forbearance rates for first mortgages, panel (b) shows forbearance rates for auto loans, panel (c) shows forbearance rates for revolving accounts, and panel (d) shows forbearance rates for student loans. We restrict to zip codes with at least ten loans. *Sources:* Equifax 10% representative sample of the U.S. credit population.

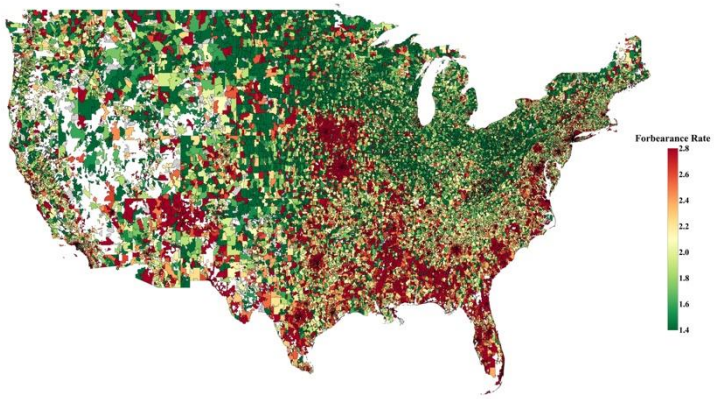
Panel (a): First Mortgages



Panel (b): Auto Debt



Panel (c): Revolving Debt



Panel (d): Student Debt

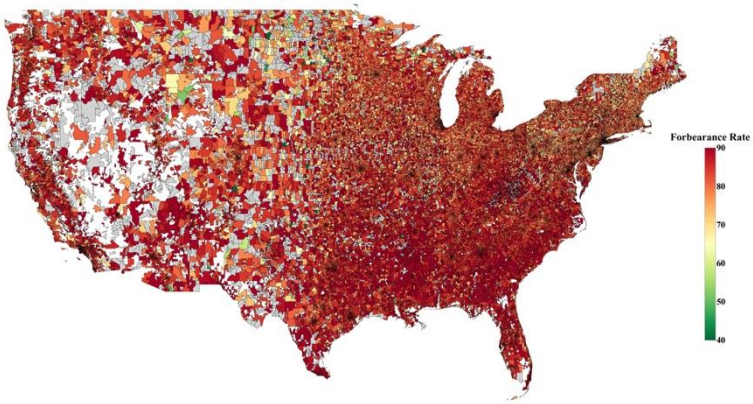
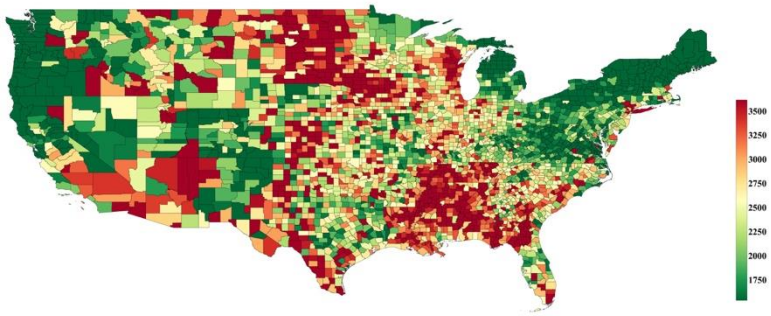


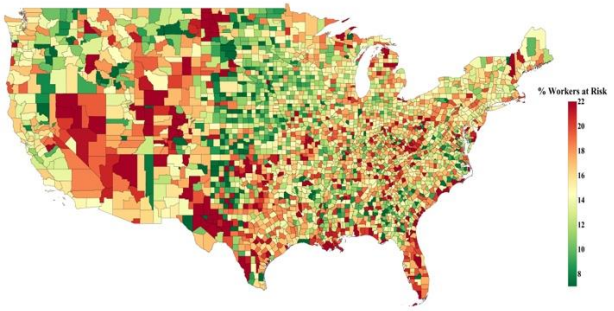
Figure A11: Geographical Heterogeneity in COVID Related Characteristics

This figure plots county level characteristics. Panel (a) shows average COVID case rates from March 2020 to May 2021, panel (b) shows the percent of workers in at risk industries, panel (c) shows the average daily change in time spent at workplaces relative to January 2020, and panel (d) shows the average daily change in credit/debit card spending relative to January 2020. Averages are taken from March to May 2021. *Sources:* COVID cases, credit/debit card spending, and time spent at workplace come from Opportunity Insights Tracker. Industry composition comes from the Bureau of Labor Statistics.

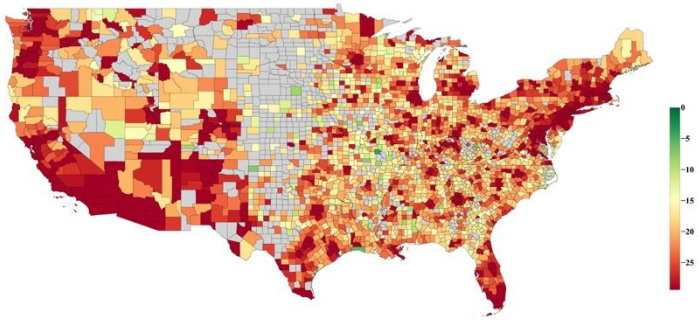
Panel (a): COVID Case Rates



Panel (b): % of at Risk Workers



Panel (c): Change in Time at Workplace



Panel (d): Change in Spending

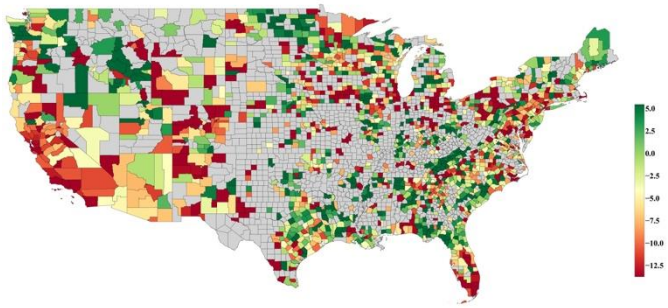
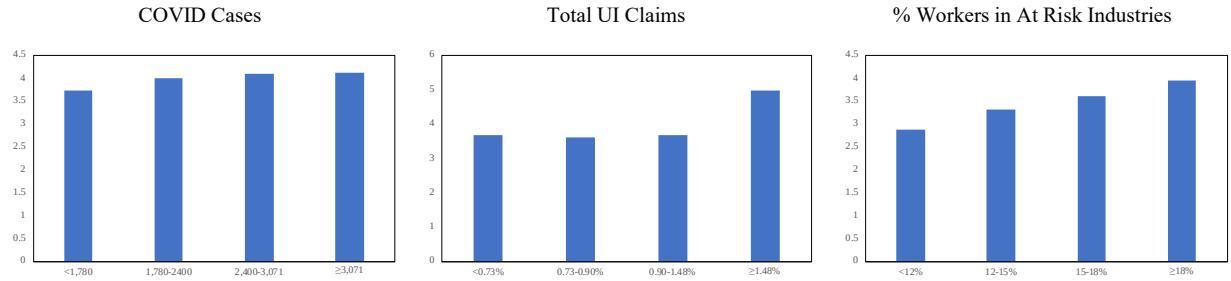


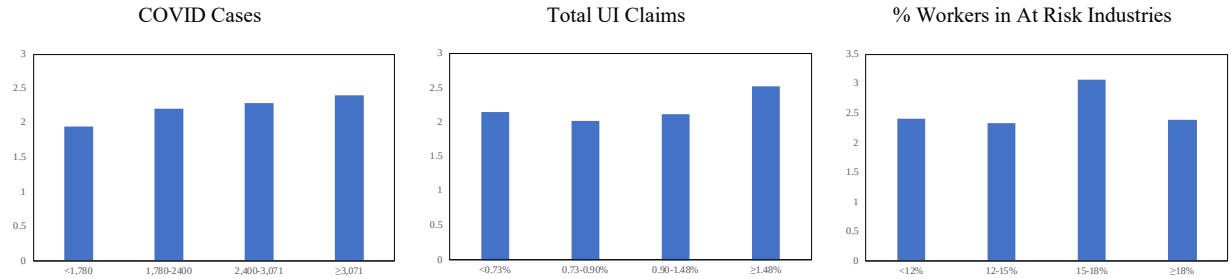
Figure A12: Regional Evidence: Mortgage Forbearance Rates and Unemployment and COVID-19 Infection rates

This figure plots zip code level average monthly forbearance rates. Average monthly forbearance rates are taken from March 2020 to May 2021. Plots are based on COVID case rates, unemployment insurance claims, and the percent of workers employed in "at risk" industries. We restrict to zip codes with at least ten loans. The left column plots by COVID case rate quantile, the middle column by total UI claims quantile, and the right column by the percent of workers in at risk industries quantile. COVID case rates are average case rates taken over the period from March to May 2021. *Sources:* Forbearance and missed payments come from Equifax 10% representative sample of the U.S. credit population. All other data come from Opportunity Insights.

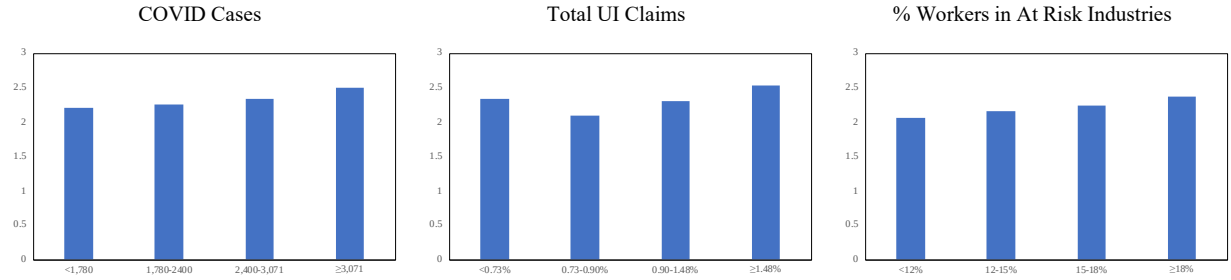
Panel (a): Mortgages



Panel (b): Auto Debt



Panel (c): Revolving Debt



Panel (d): Student Debt

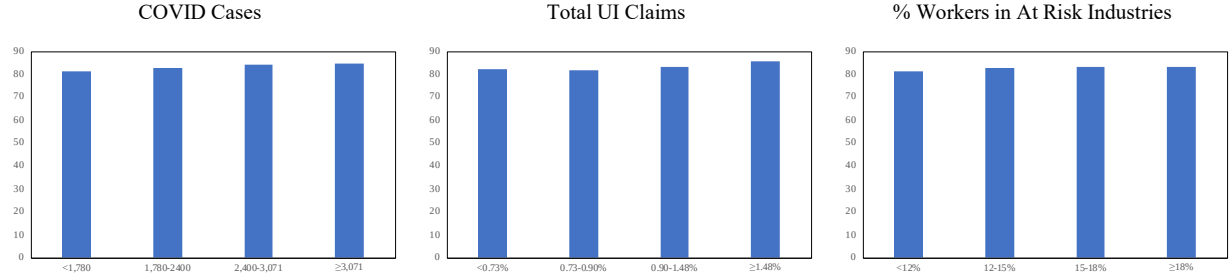
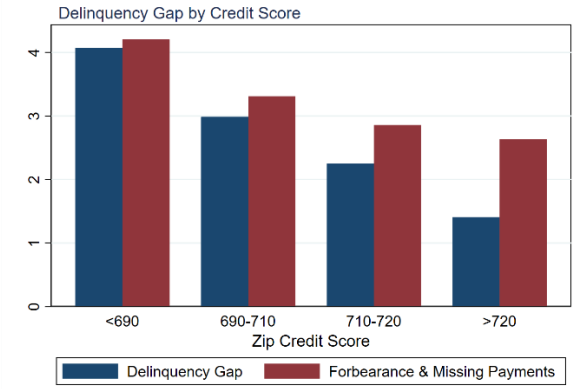
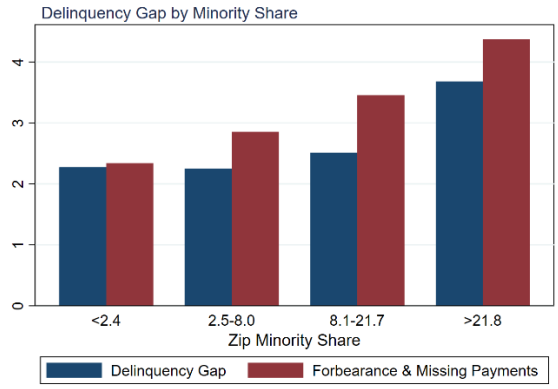


Figure A13: Missing Defaults and Forbearance Rates by Income, Credit Score, Race, Poverty Share and Education

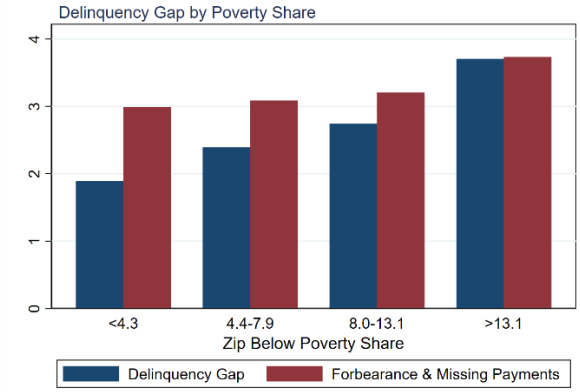
This figure plots the average monthly missing defaults rate along with the percentage of mortgage borrowers in forbearance who miss payment across zip code characteristics. Average rates are taken from April 2020 to December 2020. Plots are based on local average credit score, minority share, poverty share, median income, and college share. We restrict to zip codes with at least ten loans. *Sources:* Delinquency and Forbearance rates come from Equifax. All other data come from the U.S. Census Bureau's American Community Survey.



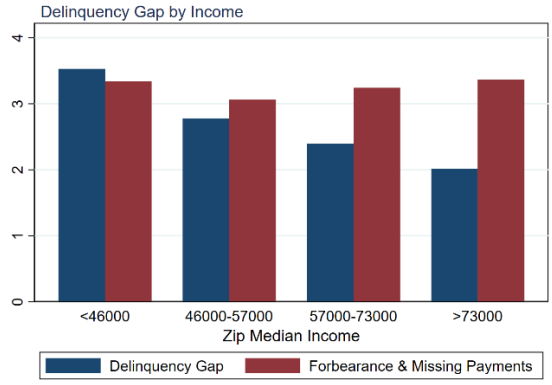
(a) Credit Score



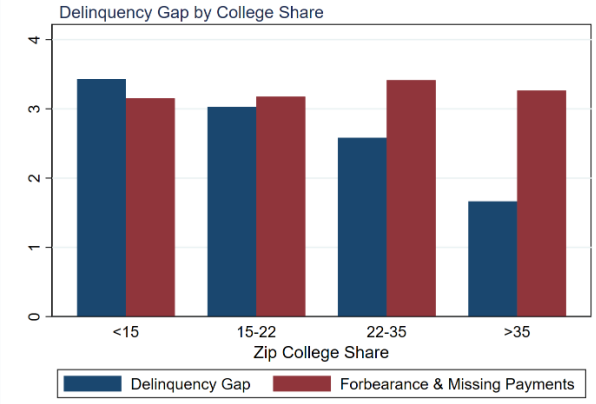
(b) Minority Share



(c) Poverty Share



(d) Income

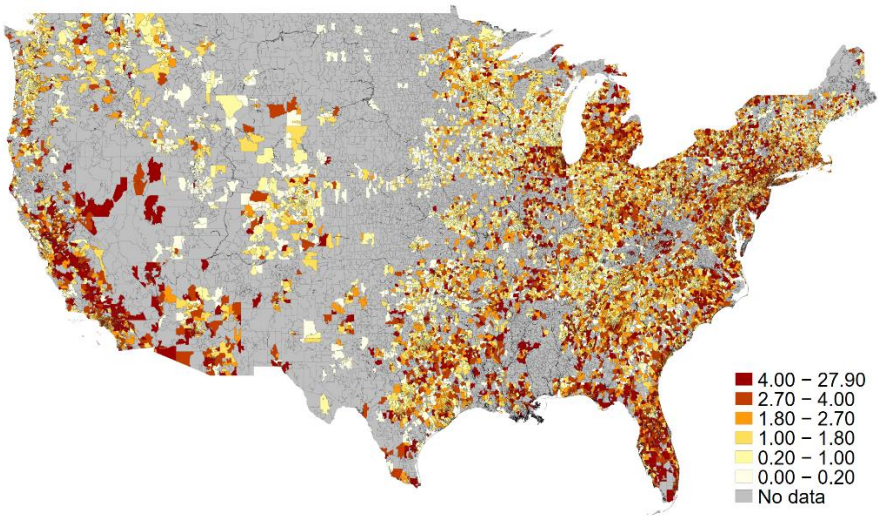


(e) % with College Education

Figure A14: Geographical Heterogeneity in Missing Defaults and Forbearance Rates

Panel (a) of this figure shows heterogeneity in average monthly missing defaults rate: the difference between the model predicted delinquency rate and the actual delinquency rate (in %). Panel (b) shows the percentage of borrowers in a region who are in forbearance and are missing payments across zip codes. We limit maps to zip codes with at least ten loans. Average monthly delinquency saved are taken from April 2020 to May 2021. *Sources:* Equifax 10% representative sample of the U.S. credit population.

Panel (a): Missing Mortgage Defaults



Panel (b): Percentage of Mortgage Borrowers who are in Forbearance and Miss Payments

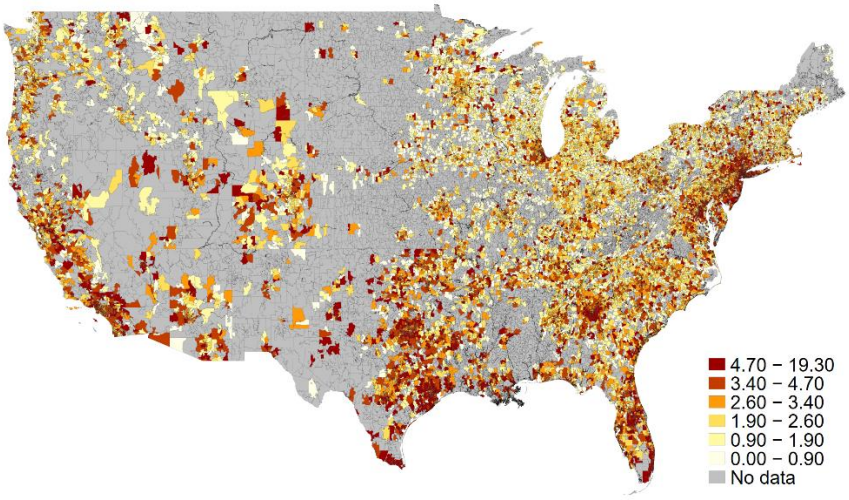
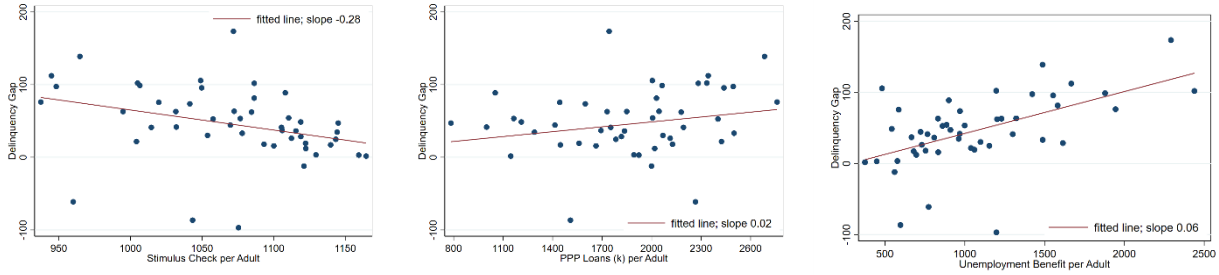


Figure A15: Missing Defaults and Other Stimulus Measures

Panel (c) of this figure plots the dollar amount of missing delinquencies per borrower – the difference between model-predicted delinquency and actual delinquency multiplied by January scheduled payments –against the amount received from stimulus checks per adult. Panel (b) plots missing delinquencies against the amount received from PPP loans. Panel (c) plots missing delinquencies against the amount received from unemployment benefits. Amounts are calculated from the months from April to December 2020. *Sources:* Delinquency and missed payments come from our model based on Equifax data, stimulus check amounts come from the Internal Revenue Service, unemployment benefits come from the Department of Labor, PPP loans come from the Small Business Administration.

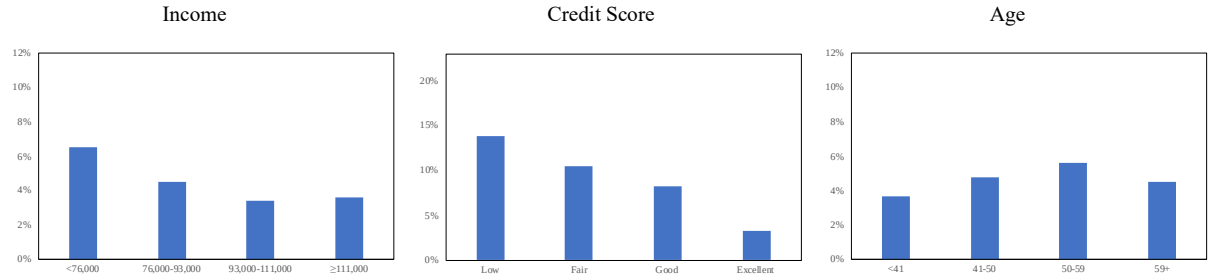


(a) Stimulus checks (b) PPP loans (c) Unemployment benefits

Figure A16: Forbearance Mandates and Forbearance Rates across Borrowers

This figure shows forbearance rates for conforming and jumbo rates, across age, income, and credit scores. Months include March 2020 to May 2021. We restrict our analysis to mortgages with balances that fall within 90% to 110% of the conforming loan limit. Jumbo loans are loans that fall above 100% of the conforming loan limit and are not covered by forbearance mandates under the CARES Act. Conforming loans are Fannie and Freddie loans that fall below 100% of the conforming loan limit. Panel (a) shows results for jumbo mortgages while panel (b) shows results for conforming mortgages. The left column plot forbearance rates by income quintiles. The center column plots similar results by credit scores and the right column by age groups. Income, age, and credit score are taken as of January 2020.

Panel (a): Not covered by mandates (jumbo mortgages)



Panel (b): Covered by mandates (conforming mortgages)

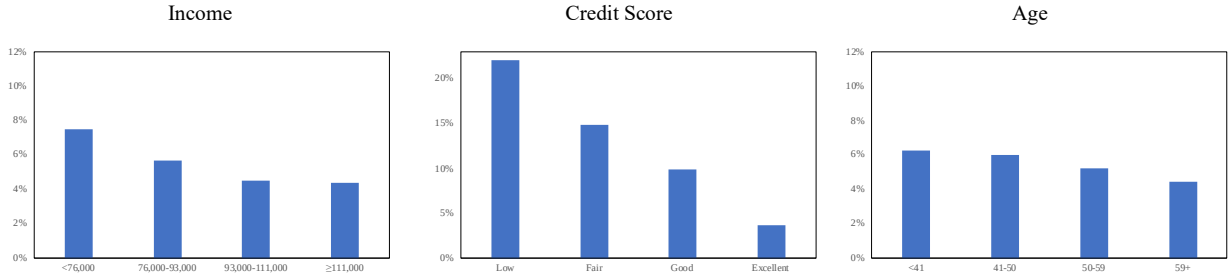
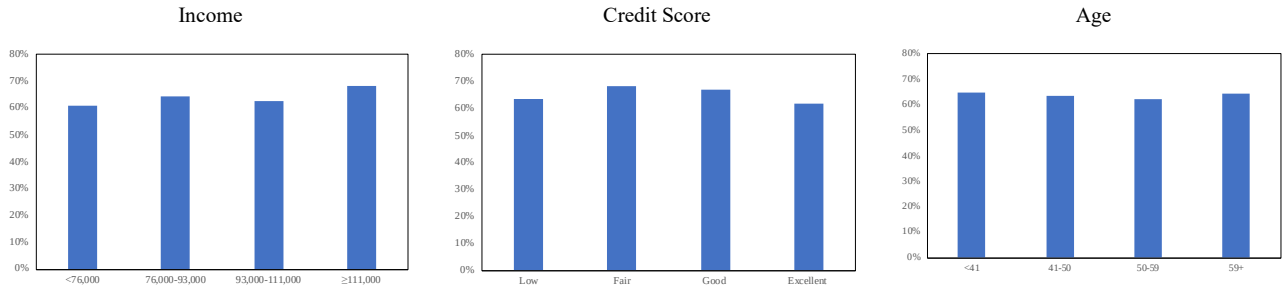


Figure A17: Forbearance Mandates and Missed Payment Percentage across Borrowers

This figure shows the percent of scheduled payments missed for conforming and jumbo mortgages. We restrict our analysis to mortgages with balances that fall within 90% to 110% of the conforming loan limit. Jumbo loans are loans that fall above 100% of the conforming loan limit and are not covered by forbearance mandates under the CARES Act (are not Fannie, Freddie, VA, or FHA loans). Conventional loans are Fannie and Freddie loans that fall below 100% of the conforming loan limit. Months include March 2020 to May 2021. Panel (a) shows results for jumbo mortgages while panel (b) shows the same for conforming mortgages. The left column plots by income quintiles, the center column plots similar results by credit scores, and the right column by age groups. Income, credit score, and age are taken as of January 2020. *Sources:* Equifax 10% representative panel of US credit population.

Panel (a): Not covered by mandates (jumbo mortgages) - % of scheduled payments missed



Panel (b): Covered by mandates (conforming mortgages) - % of scheduled payments missed

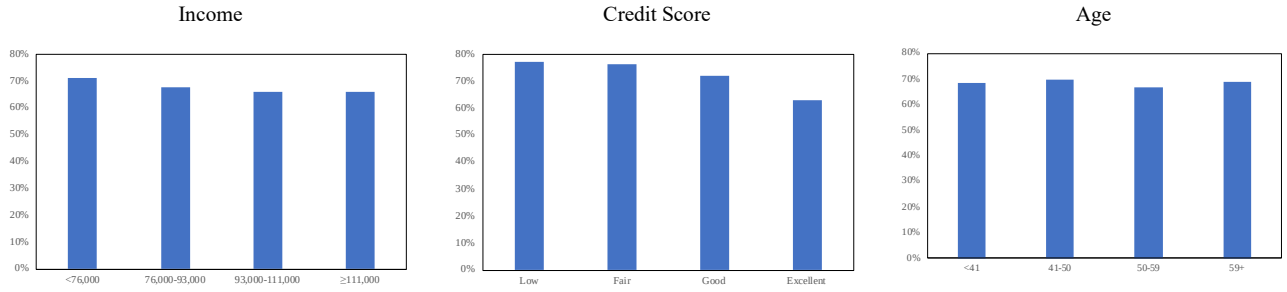


Figure A18: Pre-COVID Delinquency Rate

This figure plots the pre-COVID residualized delinquency rate around the conforming loan limit. To condition on borrower, regional and macro-economic conditions, we find the residualized delinquency rates. In particular, we estimate the following linear regression: $default_{it} = X_{it}\Gamma + \mu_t + \nu_k + \epsilon_{it}$. X_{it} is a set of borrower controls including credit score, LTV, DTI, and the squared terms. μ_t and ν_k are monthly time fixed effects and zip-code fixed effects, respectively. This figure plots the residuals ϵ_{it} against distance to conforming loan limit. We collapse residuals in 1% buckets based on a given loan's percentage of the conforming loan limit. We restrict our analysis to mortgages with balances that fall within 70% to 130% of the conforming loan limit. Dots represent delinquency rates in 1% buckets by the loan's percentage of the conforming loan limit. Shaded bands show the 95% confidence interval. Jumbo loans are loans that fall above 100% of the conforming loan limit (solid line) and are not covered by forbearance mandates under the CARES Act. Conforming loans are loans that fall below 100% of the conforming loan limit. *Sources:* Equifax 10% representative sample of the U.S. credit population.

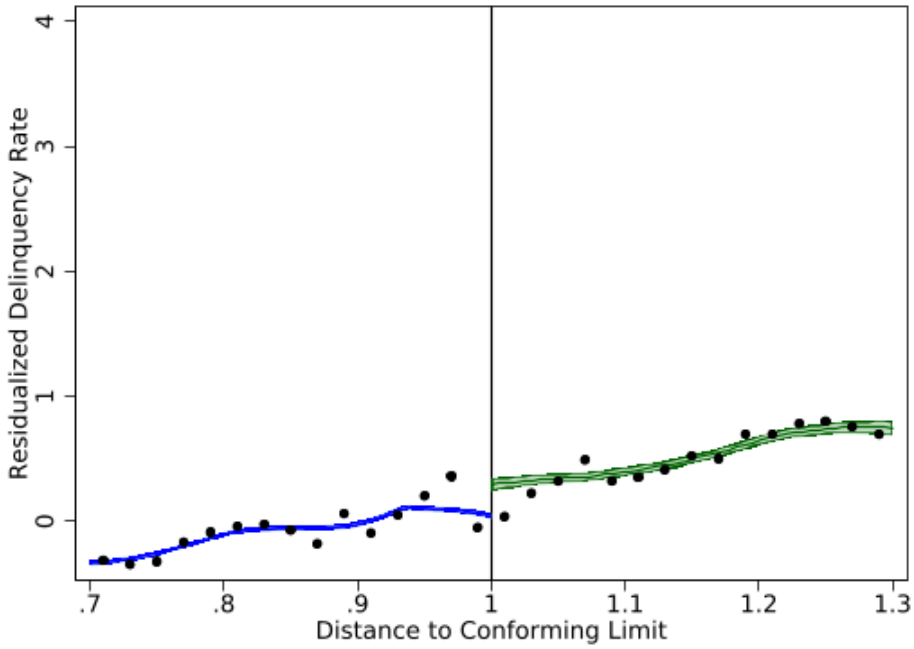
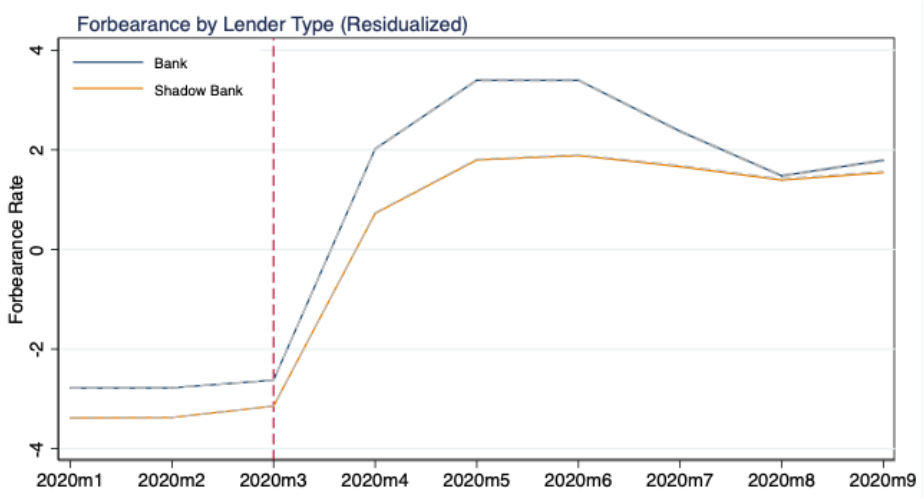
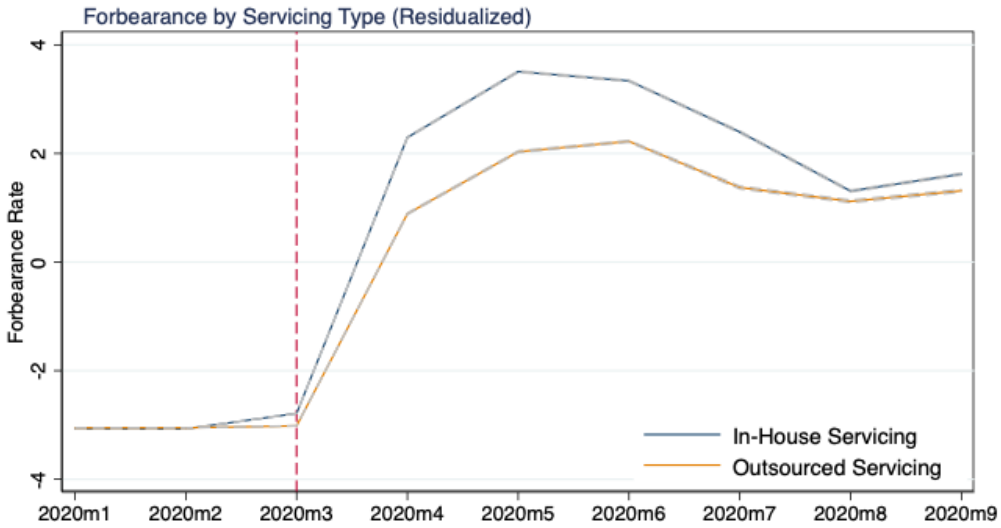


Figure A19: Forbearance Rates and Intermediary Factors

Panel (a) of this figure plots the forbearance rate of loans sold to Fannie Mae splitting the sample by banks and shadow bank originators. The banks and shadow banks are defined according to classification in Buchak and others (2018). Panel (b) plots forbearance rate of loans sold to Fannie Mae splitting the sample based on whether a loan is serviced by the originator or by other servicers. *In-House* is defined as the loan being serviced by its originator. *Outsource* is if the loan is serviced by an institution that was not its originator. The sample covers all loans sold to Fannie Mae since 2000 and that were still active as of January 2020. The dashed vertical line shows the declaration of the national emergency and the passage of the CARES Act in March 2020. Sources: Fannie Mae Loan Level Performance Data.



Panel (a): Forbearance Rates: Banks vs Shadow Banks

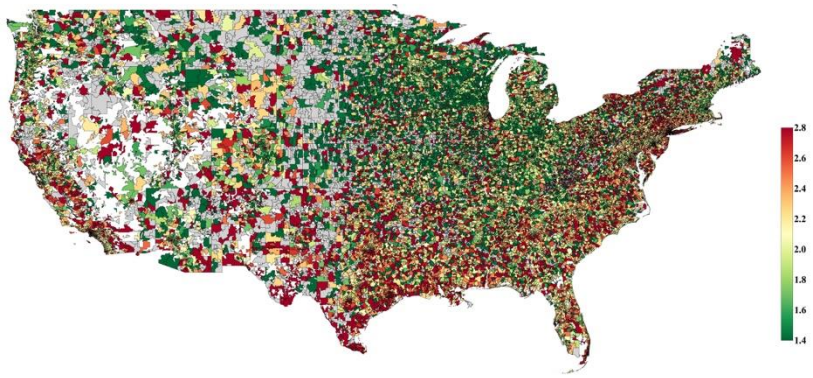


Panel (b): Forbearance Rates: In-House vs Outsourced Servicing

Figure A20: Regional Heterogeneity in % of Borrowers Remaining in Forbearance

This figure shows heterogeneity in the percent of mortgage borrowers who remain in forbearance across zip codes. Panel (a) shows the percent of mortgage borrowers who were in forbearance at some point during the pandemic and remained in forbearance as of May 2021. Panel (b) shows the percent of mortgage borrowers who were in forbearance at some point during the pandemic, remained in forbearance as of May 2021, and had missing payments. *Sources:* Equifax 10% representative sample of the U.S. credit population.

Panel (a): % of Individuals Remaining in Forbearance



Panel (b): % of Individuals Remaining in Forbearance with Missing Payments