

## Updated Figures for “Tracking and Stress-Testing U.S. Household Leverage”

Andreas Fuster, Benedict Guttman-Kenney, and Andrew Haughwout<sup>1</sup>

Federal Reserve Bank of New York Staff Report No. 787

In this document, we provide updates for a subset of figures/tables from our paper, using data through **2020:Q3**.

Links:

- Paper: [https://www.newyorkfed.org/medialibrary/media/research/staff\\_reports/sr787.pdf](https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr787.pdf)

- Blog post: <http://libertystreeteconomics.newyorkfed.org/2017/02/how-resilient-is-the-us-housing-market-now.html>

Technical notes:

We allow for changes in the data going back to 2019:Q1. This allows for ample time to match the McDash data to CCP data in the period after CRISM is available. Prior to this, we do not allow our data to change, even if there are additional loans added to CRISM (for instance, in the case of additional loan servicers reporting to McDash). Because of this, there may be minor changes to historical series in recent months relative to the paper (or the previous update) as we replace loans from our McDash-CCP match with loans from CRISM and backfill new loans to 2019:Q1 (as opposed to origination).

The data may also change if there are any recent changes in loan servicer coverage in McDash. In particular, if new loan servicers add loans to McDash in our update period, these loans will be backfilled to the point of update, rather than to origination. Our backfilling strategy allows us to preserve the historical data series, but will cause occasional sharp changes in the distribution of loans (for instance, with second liens or of a certain investor type) at the point of update. These changes should not affect aggregate balances that are weighted to the CCP.

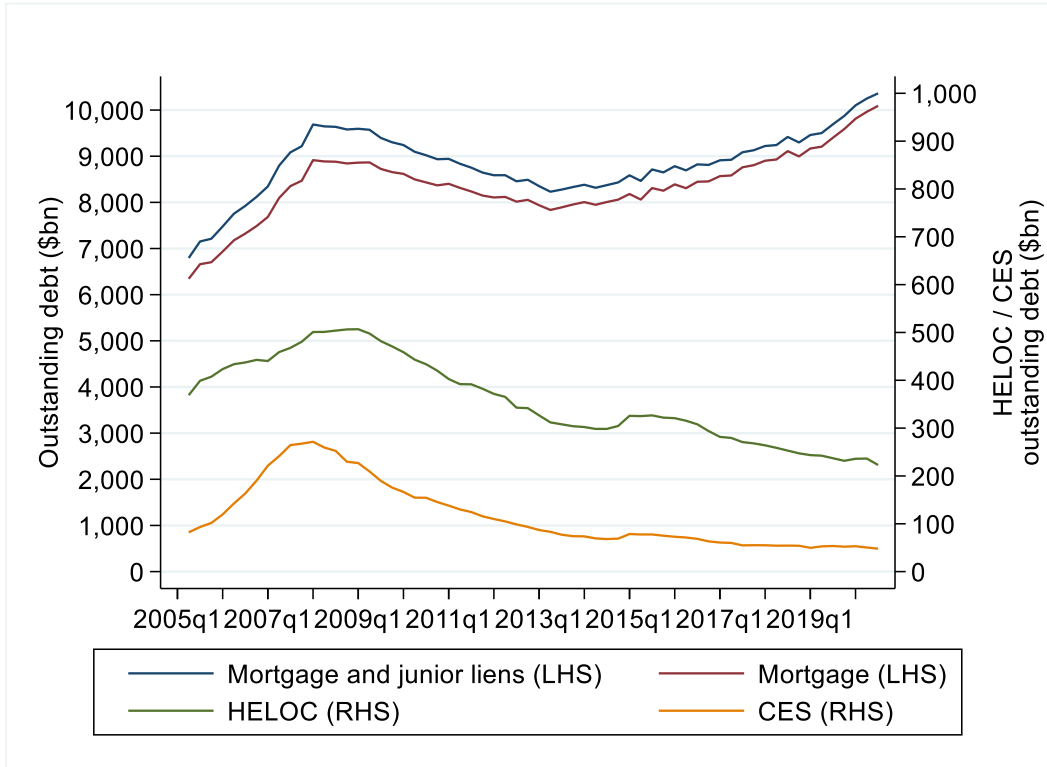
---

<sup>1</sup> We thank Belicia Rodriguez and Rebecca Landau for excellent research assistance.

Updated Figures through 2020:Q3

Figure 2: Nationwide mortgage and junior lien debt for properties with positive outstanding first mortgage balances, 2005-2020

a. Outstanding debt



b. Fraction of properties with second lien

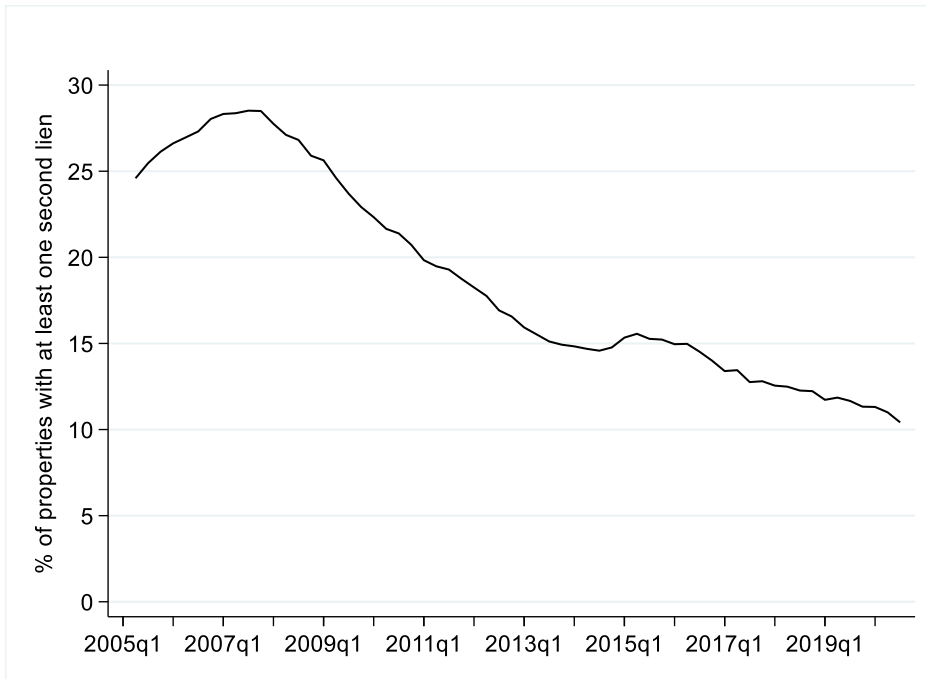
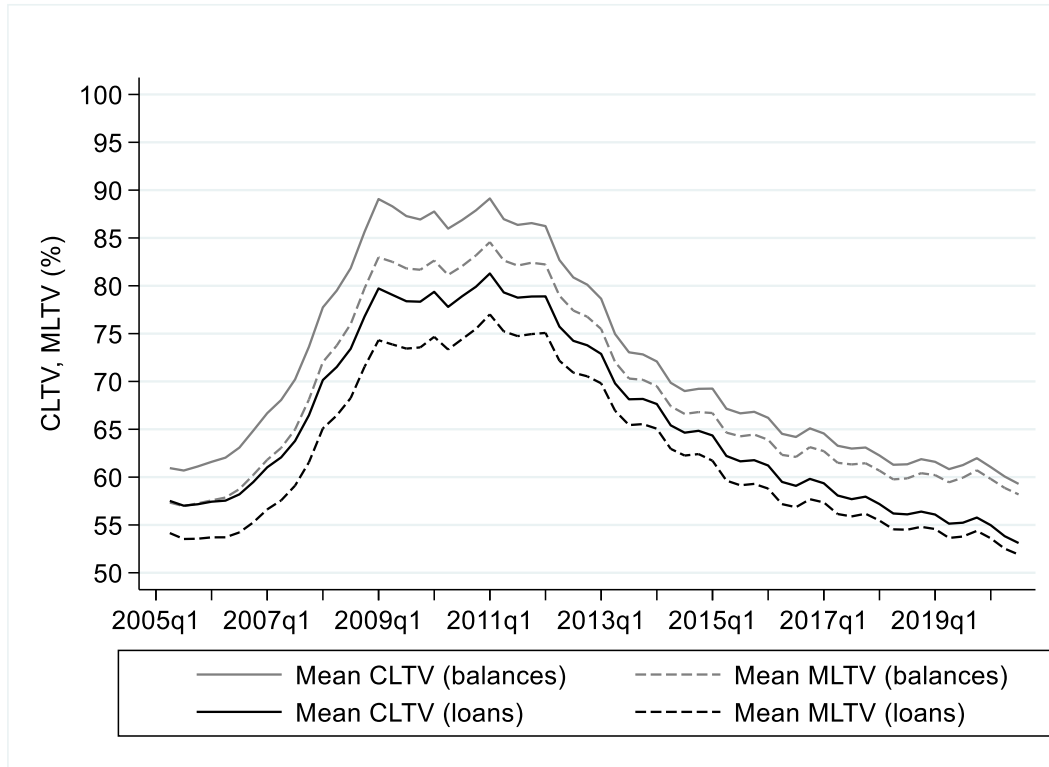


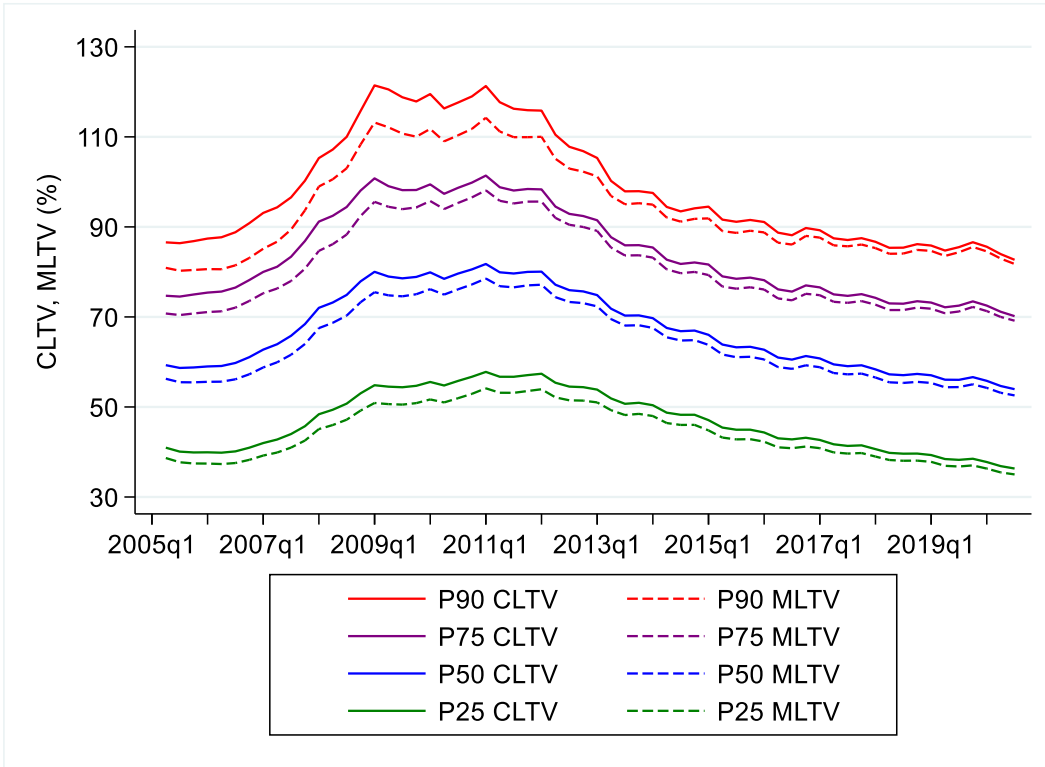
Figure 3: Nationwide distribution of leverage, 2005-2020

Note: CLTV = combined loan-to-value ratio, as defined in Section 2.1. MLTV = mortgage loan-to-value ratio, including first-lien mortgage debt only.

a. Averages



b. Distribution by loans



c. Distribution by balance-weighted loans

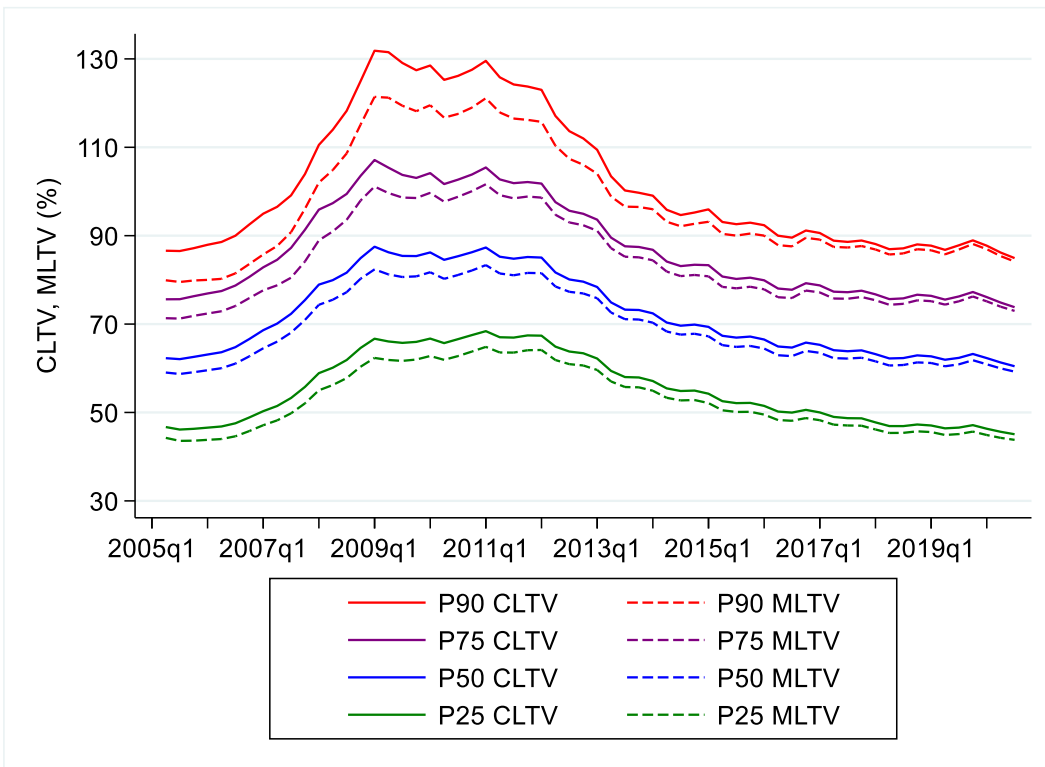
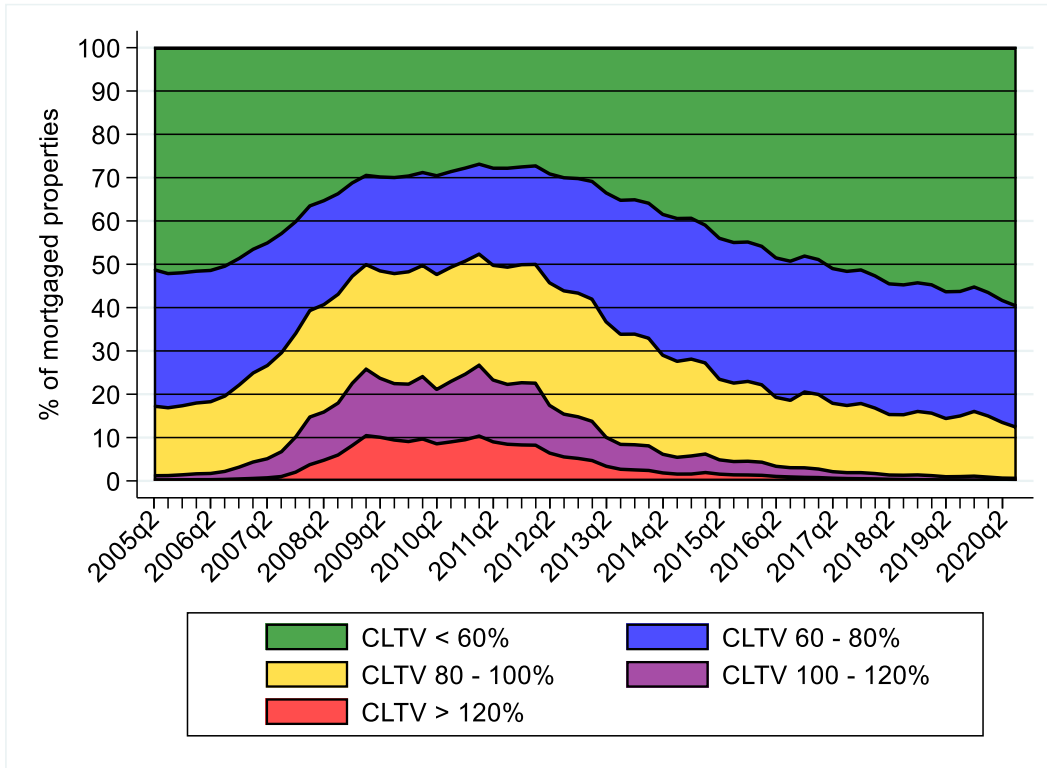


Figure 4: Nationwide distribution of CLTVs for properties with a first mortgage, 2005-2020

a. Distribution of loans (equal-weighted)



b. Distribution of balance-weighted loans

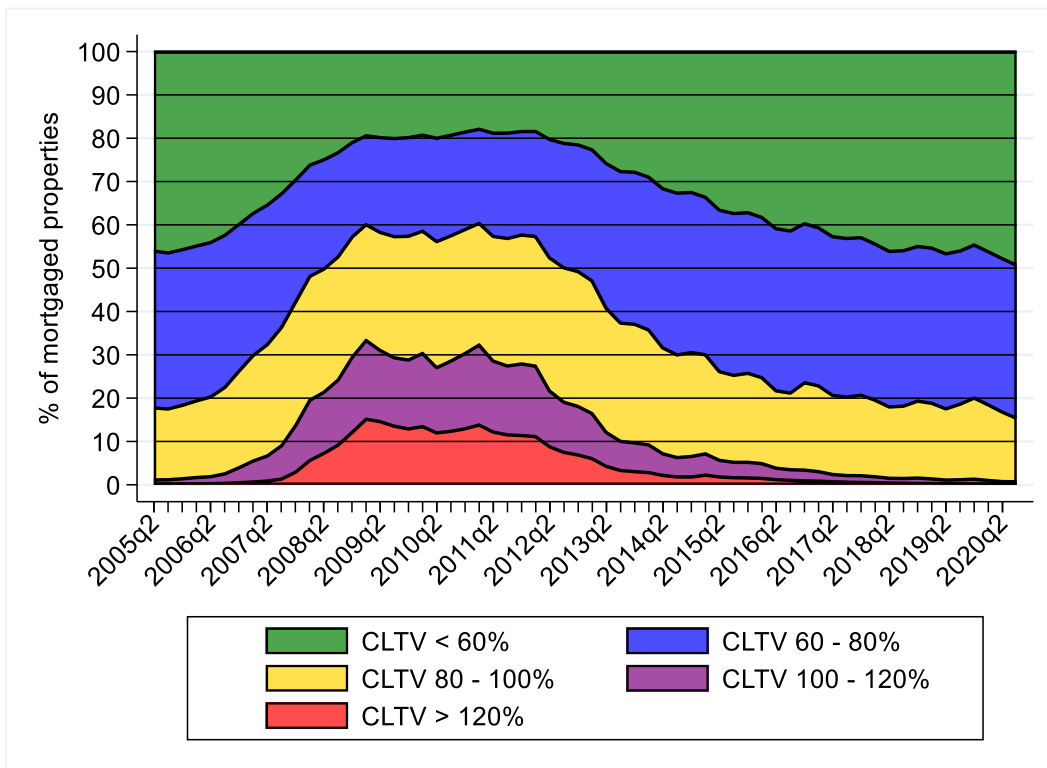


Figure 7: Estimated balance-weighted share of properties with positive first mortgage debt and CLTV  $\geq$  80% or  $\geq$  100%, as of 2020:Q3, by state

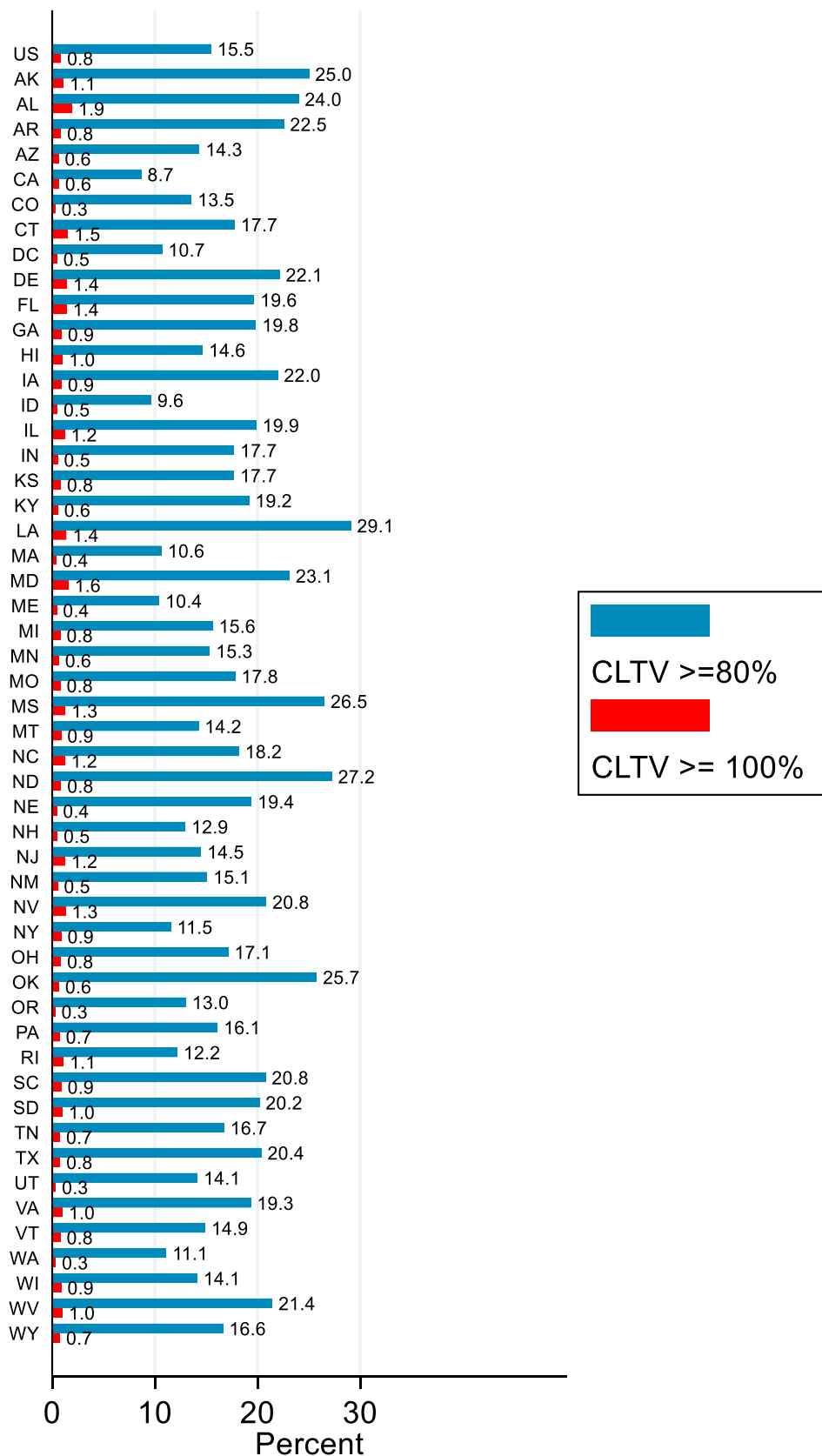


Figure 8: Estimated balance-weighted share of properties with positive first mortgage debt and CLTV  $\geq 80\%$  or  $\geq 100\%$ , 2020:Q3 vs. peak share over 2005-2020, by state

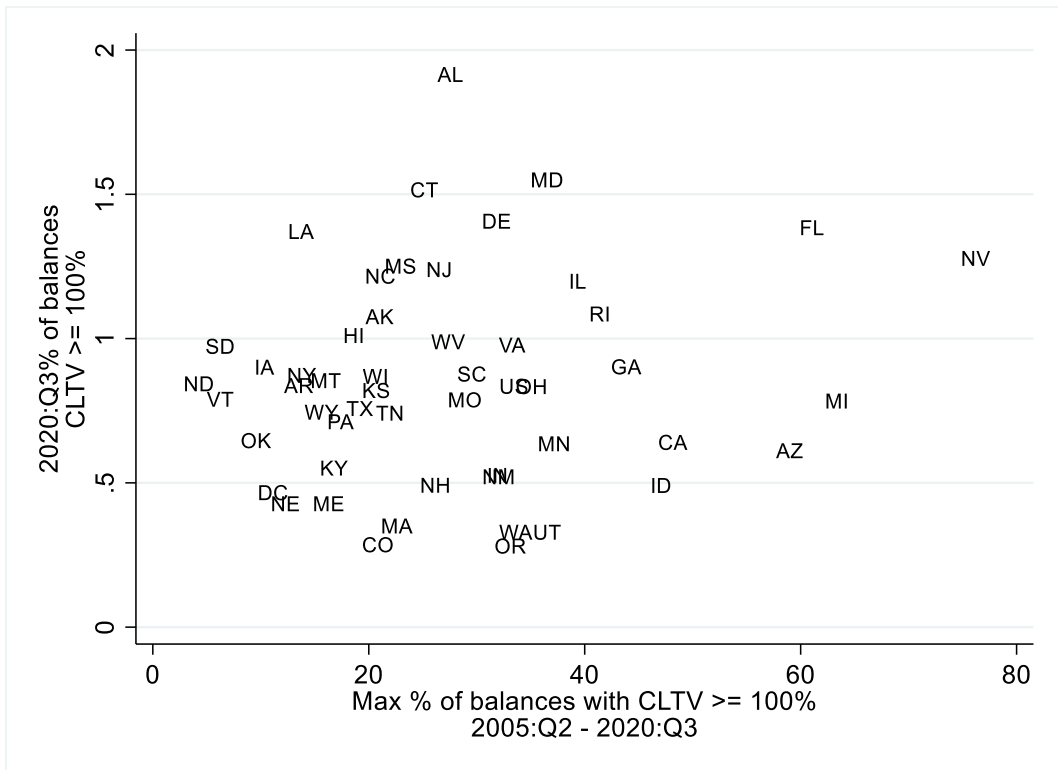
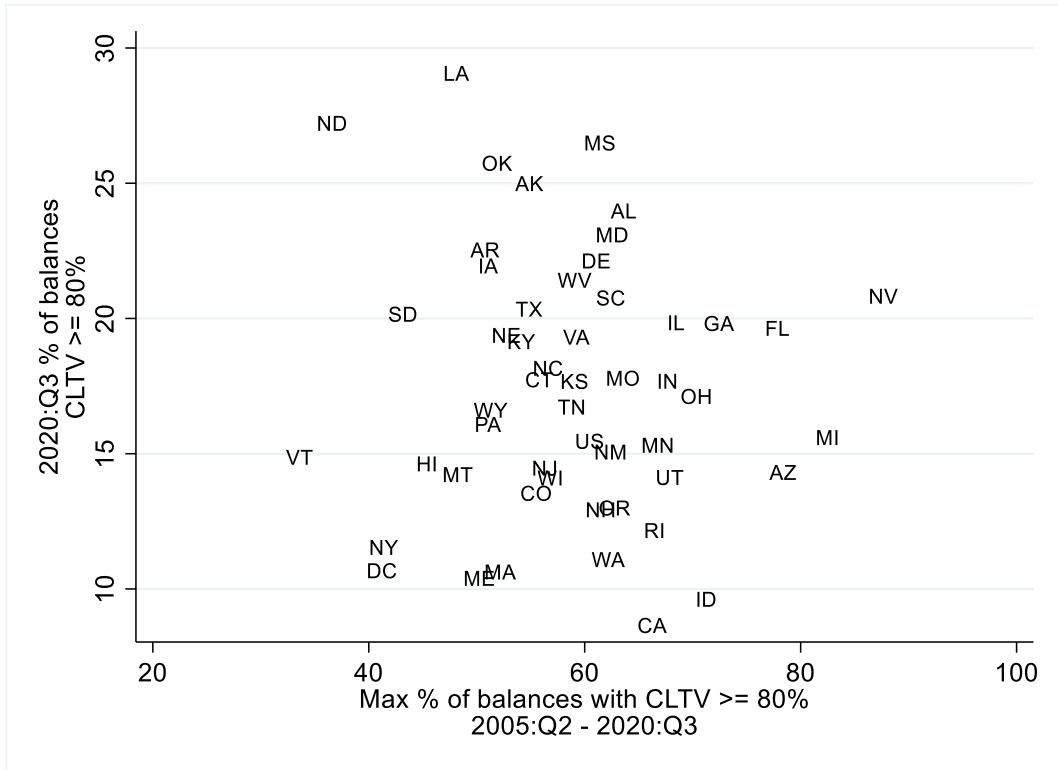


Figure 11: Share of non-seriously delinquent balances by CLTV-FICO buckets

<b>2020:Q3</b>		<b>CLTV</b>				<b>Subtotal</b>
		<b>&lt;80%</b>	<b>80-100%</b>	<b>100-120%</b>	<b>&gt;120%</b>	
<b>FICO Score</b>	<b>&lt;600</b>	3.3%	0.8%	0.0%	0.0%	4.2%
	<b>600-659</b>	4.8%	1.7%	0.1%	0.0%	6.5%
	<b>660-699</b>	7.1%	2.3%	0.1%	0.0%	9.6%
	<b>700-739</b>	10.8%	2.7%	0.1%	0.0%	13.6%
	<b>&gt;=740</b>	58.6%	7.1%	0.3%	0.1%	66.1%
<b>Subtotal</b>		<b>84.6%</b>	<b>14.6%</b>	<b>0.6%</b>	<b>0.2%</b>	



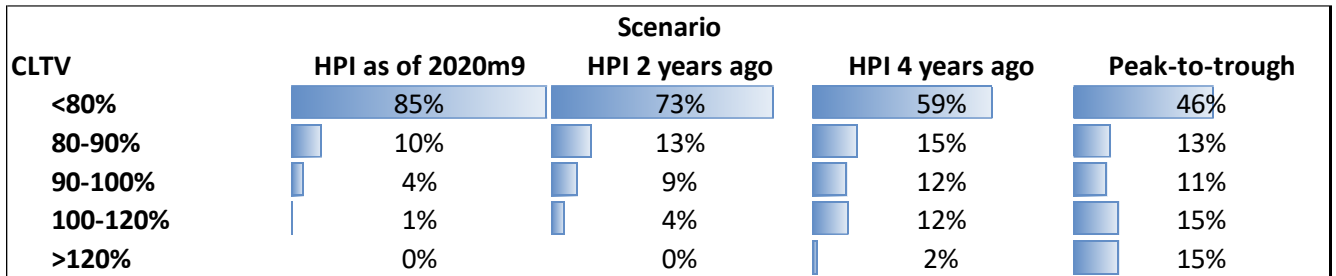
Figure 13: Scenarios for house price shocks, distribution across mortgaged properties in our sample, 2005-2020

	HPI 2 years ago			HPI 4 years ago		
	10th Pctile	50th Pctile	90th Pctile	10th Pctile	50th Pctile	90th Pctile
2006:Q1	-34.4%	-18.4%	-6.4%	-51.0%	-31.2%	-11.6%
2007:Q1	-20.7%	-8.6%	1.9%	-43.1%	-27.1%	-9.7%
2008:Q1	-4.9%	7.1%	36.5%	-26.7%	-11.2%	5.3%
2009:Q1	4.2%	19.9%	70.4%	-8.7%	10.8%	52.9%
2010:Q1	2.7%	13.9%	39.6%	1.3%	20.6%	89.4%
2011:Q1	-0.6%	5.4%	16.2%	7.4%	28.5%	88.3%
2012:Q1	-2.3%	4.3%	12.1%	3.4%	19.2%	45.3%
2013:Q1	-15.7%	-6.5%	1.3%	-12.8%	-0.4%	12.4%
2014:Q1	-24.7%	-12.1%	-3.3%	-22.3%	-9.0%	3.0%
2015:Q1	-18.7%	-11.1%	-3.4%	-31.7%	-15.6%	-3.3%
2016:Q1	-15.4%	-8.7%	-1.8%	-34.4%	-20.1%	-6.4%
2016:Q3	-15.3%	-9.2%	-2.5%	-31.7%	-19.0%	-7.1%
2017:Q1	-15.6%	-9.6%	-3.3%	-30.7%	-19.9%	-7.2%
2017:Q3	-15.8%	-10.0%	-3.7%	-28.0%	-17.8%	-7.3%
2018:Q1	-16.2%	-10.6%	-4.4%	-28.3%	-18.6%	-8.0%
2018:Q3	-15.2%	-10.3%	-4.5%	-27.8%	-18.5%	-8.1%
2019:Q1	-13.6%	-9.5%	-4.4%	-26.8%	-18.6%	-8.6%
2019:Q3	-12.5%	-8.3%	-4.1%	-25.4%	-18.0%	-9.4%
2020:Q1	-12.0%	-7.7%	-3.1%	-24.6%	-18.0%	-10.0%
2020:Q3	-14.2%	-9.2%	-4.5%	-25.9%	-19.1%	-10.6%

	Peak-to-trough (as of 2020:Q3)		
	10th Pctile	50th Pctile	90th Pctile
2020:Q3	-51.7%	-25.6%	-9.9%

Figure 14: Effects of different house price scenarios on CLTV distribution (balance-weighted), 2020:Q1

a. Aggregate



b. State level: estimated balance weighted fraction of borrowers in negative equity

	Base	HPI 2 years ago		HPI 4 years ago		Peak-to-trough		Highest level since 2005	
US	1%	5%	14%	30%	33%				
AK	1%	5%	8%	10%	21%				
AL	2%	8%	18%	24%	28%				
AR	1%	7%	14%	9%	14%				
AZ	1%	8%	23%	68%	59%				
CA	1%	2%	9%	40%	48%				
CO	0%	4%	16%	9%	21%				
CT	2%	4%	6%	28%	25%				
DC	0%	1%	4%	2%	11%				
DE	1%	5%	10%	32%	32%				
FL	1%	7%	20%	70%	61%				
GA	1%	8%	20%	36%	44%				
HI	1%	3%	9%	15%	19%				
IA	1%	5%	12%	5%	10%				
ID	0%	9%	30%	36%	47%				
IL	1%	3%	8%	46%	39%				
IN	1%	8%	20%	15%	32%				
KS	1%	7%	15%	11%	21%				
KY	1%	6%	16%	8%	17%				
LA	1%	5%	11%	14%	14%				
MA	0%	3%	10%	15%	23%				
MD	2%	5%	12%	42%	37%				
ME	0%	7%	17%	8%	16%				
MI	1%	5%	19%	51%	63%				
MN	1%	4%	15%	30%	37%				
MO	1%	6%	17%	20%	29%				
MS	1%	10%	18%	20%	23%				
MT	1%	7%	15%	9%	16%				
NC	1%	7%	17%	12%	21%				
ND	1%	3%	6%	2%	4%				
NE	0%	6%	17%	4%	12%				
NH	0%	6%	15%	19%	26%				
NJ	1%	3%	7%	29%	27%				
NM	1%	6%	13%	21%	32%				
NV	1%	7%	31%	81%	76%				
NY	1%	2%	6%	10%	14%				
OH	1%	7%	17%	20%	35%				
OK	1%	6%	12%	4%	10%				
OR	0%	4%	16%	25%	33%				
PA	1%	4%	11%	10%	17%				
RI	1%	5%	14%	40%	41%				
SC	1%	7%	18%	22%	30%				
SD	1%	7%	15%	3%	6%				
TN	1%	7%	21%	10%	22%				
TX	1%	5%	16%	9%	19%				
UT	0%	8%	31%	32%	37%				
VA	1%	5%	12%	37%	33%				
VT	1%	4%	9%	9%	6%				
WA	0%	5%	20%	22%	34%				
WI	1%	6%	16%	14%	21%				
WV	1%	6%	11%	31%	27%				
WY	1%	7%	13%	10%	16%				

Figure 17: 24-month serious delinquency forecasts (balance-weighted) under different house price scenarios

Note: “Base” = house prices stay constant at the level of the as-of date; “HPI-2” / “HPI-4” = local house prices return to their level 2 (or 4) years ago; “P2T” = local house prices experience a drop similar to the drop from their peak to their trough during the period since 2005, measured again at the local (mostly county) level. Projections up to 2016m9 are the same as in the original paper and are given for reference.

Delinquency rate (balances)				
	Base	HPI-2	HPI-4	P2T
2012m3	8.8%	8.0%	5.7%	16.0%
2012m6	7.9%	7.6%	5.9%	15.1%
2012m9	7.5%	7.7%	6.1%	14.8%
2012m12	7.4%	8.0%	6.8%	14.7%
2013m3	7.1%	8.3%	7.3%	14.7%
2013m6	6.3%	7.9%	7.1%	13.3%
2013m9	5.9%	7.8%	7.0%	12.8%
2013m12	5.8%	8.0%	7.0%	12.8%
2014m3	5.7%	8.0%	7.2%	12.6%
2014m6	5.2%	7.1%	6.9%	11.8%
2014m9	5.0%	6.8%	7.1%	11.6%
2014m12	5.1%	6.8%	7.5%	11.7%
2015m3	4.9%	6.5%	7.8%	11.4%
2015m6	4.6%	5.8%	7.4%	10.7%
2015m9	4.5%	5.5%	7.6%	10.6%
2015m12	4.5%	5.5%	7.8%	10.7%
2016m3	4.4%	5.3%	7.8%	10.4%
2016m9	4.2%	5.2%	7.2%	10.0%
2017m3	4.2%	5.2%	7.0%	9.9%
2017m9	4.0%	4.9%	6.2%	9.4%
2018m3	3.9%	4.9%	6.2%	9.3%
2018m9	3.7%	4.6%	5.8%	8.8%
2019m3	3.8%	4.6%	6.0%	9.0%
2019m9	3.7%	4.4%	5.7%	8.8%
2020m3	3.7%	4.3%	5.5%	8.6%
2020m9	3.2%	3.8%	5.0%	7.8%

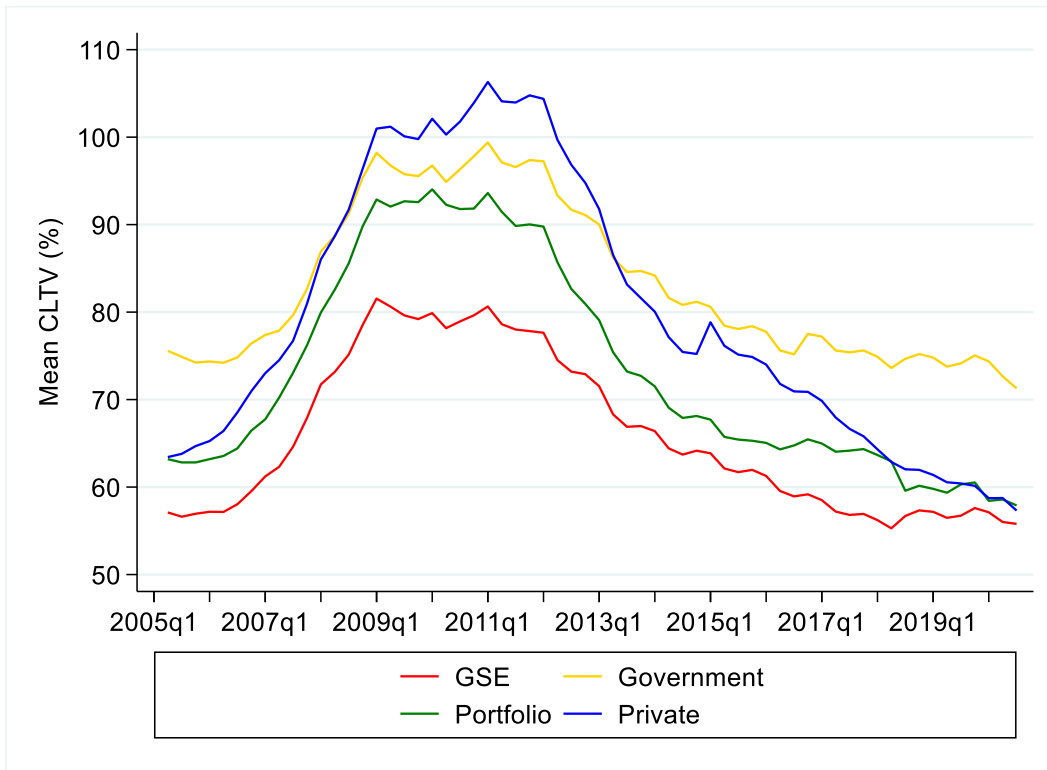
Figure 18: 24-month serious delinquency forecasts (balance-weighted) under different house price scenarios as of 2020:Q3 – state level

Note: “Base” = house prices stay constant at the level of the as-of date; “HPI-2” / “HPI-4” = local house prices return to their level 2 (or 4) years ago; “P2T” = local house prices experience a drop similar to the drop from their peak to their trough during the period since 2005, measured again at the local (mostly county) level

	State delinquency rate (balances)			24 Months
	Base	HPI-2	HPI-4	P2T
US	3.2%	3.8%	5.0%	7.8%
AK	3.6%	4.2%	4.6%	4.7%
AL	4.4%	5.4%	6.6%	7.6%
AR	4.0%	4.9%	5.8%	5.2%
AZ	3.0%	4.3%	6.2%	14.5%
CA	2.3%	2.7%	3.6%	8.5%
CO	2.5%	3.1%	4.6%	3.6%
CT	3.5%	4.1%	4.5%	7.3%
DC	2.2%	2.4%	2.8%	2.7%
DE	4.2%	4.7%	5.4%	8.7%
FL	3.9%	4.9%	6.5%	16.3%
GA	4.0%	4.9%	6.7%	9.4%
HI	2.6%	2.9%	3.5%	4.4%
IA	3.3%	4.0%	4.7%	4.0%
ID	2.5%	3.8%	6.5%	7.6%
IL	3.4%	3.8%	4.5%	9.9%
IN	3.8%	5.0%	6.5%	5.8%
KS	3.2%	4.2%	5.1%	4.7%
KY	3.8%	4.7%	6.0%	4.9%
LA	5.0%	5.6%	6.3%	6.5%
MA	2.7%	3.2%	4.2%	4.9%
MD	4.0%	4.6%	5.4%	10.3%
ME	3.2%	4.3%	5.6%	4.6%
MI	3.2%	3.9%	5.5%	11.5%
MN	2.7%	3.4%	4.6%	6.7%
MO	3.5%	4.4%	5.7%	6.1%
MS	5.2%	6.6%	7.5%	7.6%
MT	2.7%	3.6%	4.7%	3.9%
NC	3.6%	4.5%	5.8%	5.2%
ND	3.2%	3.5%	3.8%	3.4%
NE	3.0%	3.8%	5.0%	3.6%
NH	3.0%	3.9%	5.1%	5.6%
NJ	3.3%	3.8%	4.4%	7.4%
NM	3.4%	4.4%	5.3%	6.5%
NV	3.6%	4.4%	7.8%	18.2%
NY	2.9%	3.1%	3.7%	4.4%
OH	3.7%	4.7%	6.1%	6.4%
OK	4.2%	5.2%	5.7%	4.8%
OR	2.3%	2.9%	4.4%	5.7%
PA	3.3%	4.0%	4.9%	4.9%
RI	3.4%	4.3%	5.5%	9.8%
SC	4.0%	4.9%	6.2%	7.0%
SD	2.9%	3.7%	4.7%	3.2%
TN	3.5%	4.5%	6.3%	4.8%
TX	4.0%	4.7%	6.0%	5.2%
UT	2.7%	3.9%	6.8%	6.8%
VA	3.1%	3.9%	4.6%	8.4%
VT	2.9%	3.4%	3.9%	4.0%
WA	2.4%	3.2%	5.2%	5.5%
WI	2.8%	3.6%	4.9%	4.6%
WV	4.6%	5.6%	6.5%	9.3%
WY	3.1%	4.1%	4.8%	4.4%

Figure 19: CLTV distributions and delinquencies by funding source

a. Average CLTVs, 2005-2020



b. CLTV categories by funding source, 2020:Q3

CLTV Category	Funding Source			
	GSE	Government	Portfolio	Private
<80%	89%	64%	91%	87%
80-90%	9%	22%	6%	6%
90-100%	2%	13%	2%	3%
100-120%	0%	1%	0%	2%
>120%	0%	0%	0%	2%
<b>Share of Total Outstanding</b>	<b>55%</b>	<b>19%</b>	<b>20%</b>	<b>5%</b>

c. Delinquencies in stress testing scenarios, 2020:Q3

Funding source	Scenario			
	Base	HPI-2	HPI-4	P2T
GSE	2.2%	2.7%	3.5%	5.9%
Government	6.5%	8.1%	10.6%	14.4%
Portfolio	1.9%	2.3%	3.1%	5.6%
Private	6.1%	6.8%	7.9%	12.1%