
Second Liens and the Holdup Problem in First-lien Mortgage Renegotiation

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Servicing and Ownership Structure

	Servicer	Investor
Second lien	Bank B	Bank B
First lien	Bank A	Securitized

- Bank A services the 1st lien
- Bank B owns and services the 2nd lien
- Each servicer acts in the behalf of the investors (owners) in the liens
- The investors (Bank B and investors in MBS) might have different objectives
- E.g., following delinquency, the senior lien might be interested to liquidate the asset while the second lien might be interested to keep it alive.

Conflict of Interest in Mortgages

	Servicer	Investor
Second lien	Bank A	Bank A
First lien	Bank A	Securitized



- Bank A has a conflict of interest upon delinquency of borrower
 - Fiduciary duty to first-lien investors
 - Wants to maximize value of second-lien loan
- Bank A can holdup 1st-lien investors:
 - No action; wait. Potentially the borrower self-cures, finds a new job, housing market recovers, etc.
 - Encourage borrower to stay current on second-lien loan
 - Modify first-lien loan with concessionary terms. This way, there is more cash flow available for the second-lien loan
- 56% of GSE loans; 46% of PLS loans

Motivation

- In recent years, second mortgages became a common source of consumer credit
 - More than 50% of mortgages (Goodman, Ashworth, and Yin 2010)
 - Over \$1tr in 2008 (Lee, Mayer, and Tracy 2012)
 - Can be used to finance home down payments or consumption
- As in corporate finance, senior- and junior-lien holders may have conflict of interest at times of borrower delinquency
 - Senior lien holders are often interested in liquidation (Warner 1977, White 1983)
 - Junior lien holders can benefit from the option value in keeping the borrower alive
- Owners of second-lien loans often service both first- and second-lien loans (Engel and McCoy 2011)
 - Do “holdup servicers” use their position to take decisions that benefit them as second-lien holders?
- How do these conflicts affect residential loan loss resolution?

Literature

- Second-lien owners may hold up first-lien investors
 - Goodman (2009), Mayer, Morrison, Piskorski (2010), Cordell, Dynan, Lehnert, Liang, and Mauskopf (2011), Lee, Mayer, and Tracy (2012)
 - **No action** ↑
 - Liquidation ↓ Voluntary liquidation ↓
 - Modification ↓ Conditional on modification: concessionary modification ↑
- Congressman Brad Miller (D, NC) proposed the *Mortgage Servicing Conflict of Interest Elimination Act of 2010*, which aims to prevent servicers from servicing first-lien mortgages that are attached to second liens that they own

Testing for Holdup

	Servicer	Investor
Second lien	Bank A	Bank A
First lien	Bank A	Securitized

Holdup

	Servicer	Investor
Second lien	Bank B	Bank B
First lien	Bank A	Securitized

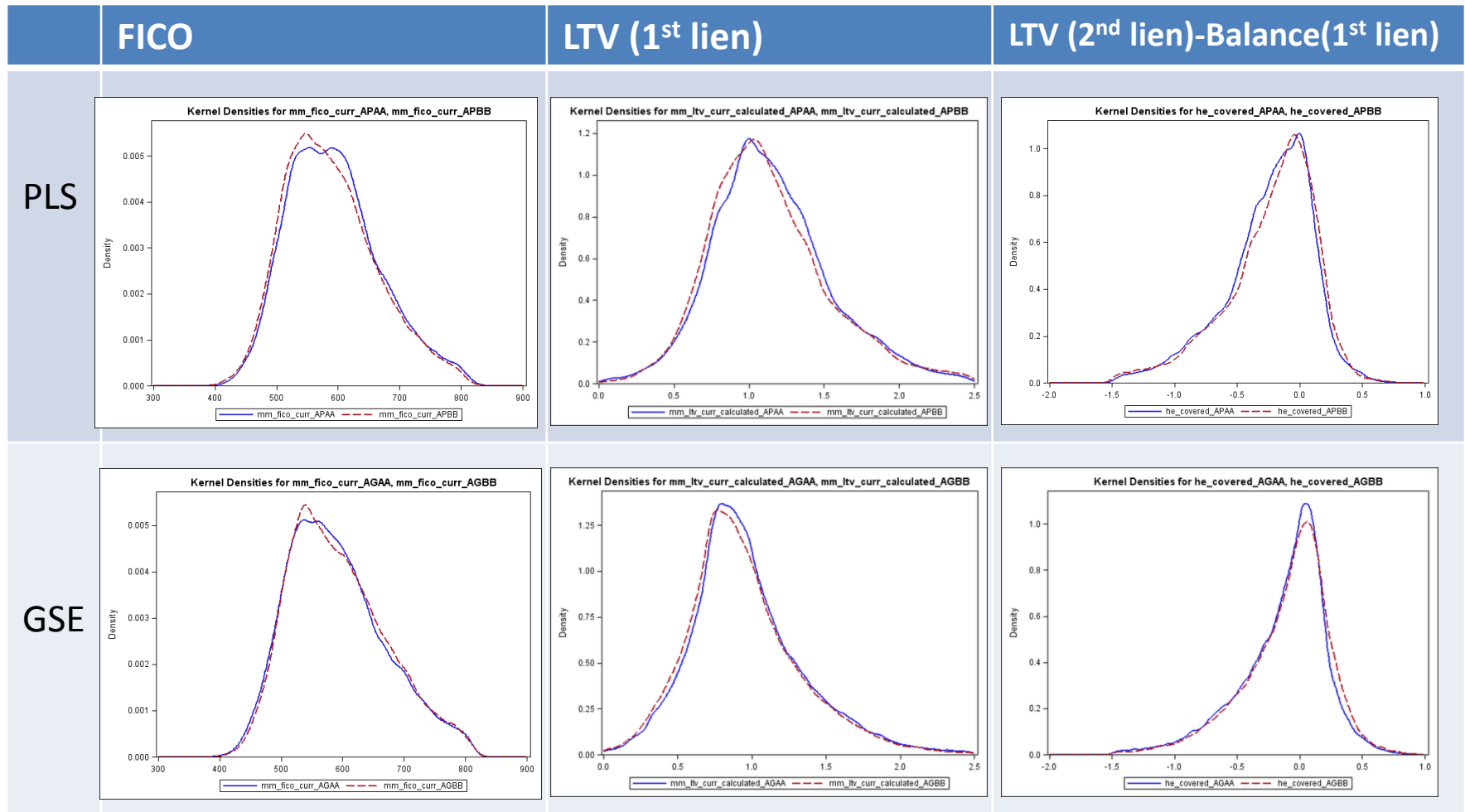
No Holdup

- Caution: In the “No Holdup” group there is a possibility for holdup as well (Bank B holds up investors). However, holdup is easier to carry out in the “Holdup” group

Data

- OCC-OTS Mortgage Metrics (MM) dataset
 - Covers first liens serviced by 10 largest banks
 - Approx. 64% of first lien mortgages in the US
 - Loss mitigation since January 2008
- OCC/OTS Home Equity (HE) dataset
 - Covers first liens serviced by 10 largest banks
 - Approx. 65% of second lien mortgages in the US
 - Loss mitigation since May 2008
- OCC/OTS Home Equity Crosswalk (HECW)
 - Address matching between MM and HE
 - Crosswalk has data from Dec 2009
- Final Data: 2008Q2 –2010Q4

Comparing Holdup and No Holdup Groups



Univariate Analysis: First-Lien Actions (%)

	PLS		GSE	
	Treatment	Control	Treatment	Control
N (within 6 months) =	29,560	24,274	100,084	56,053
No action	57.9	51.3	57.4	55.8
In foreclosure process	28.8	31.8	26.9	27.9
Liquidated	2.1	1.8	2.5	2.4
Modified	5.8	8.7	6.6	6.4
Repayment/Prepaid (incl. voluntary liq)	6.8	7.5	7.8	8.1
2nd lien performing at beginning	50.4	55.6	51.9	58.8
N (within 12 months) =	24,055	20,244	83,117	45,623
No action	44.2	37.4	43.6	41.3
In foreclosure process	32.0	33.6	27.5	28.2
Liquidated	5.0	5.2	4.8	5.3
Modified	11.9	16.0	16.4	16.7
Repayment/Prepaid (incl. voluntary liq)	9.8	10.4	10.7	11.2
2nd lien performing at beginning	52.5	57.7	53.5	61.1

Empirical Specification

Action within 6/12 month = Holdup indicator + controls + e

- Controls include:
 - Second lien has defaulted at the time of delinquency
 - 5 buckets of FICO at the time of delinquency
 - 5 buckets of the leverage of the first-lien loan at the time of delinquency
 - 5 buckets of the unpaid balance (in dollars) of the first- and second-lien loans
 - Fraction of the second-lien loan that could be covered by the current value of the house
 - 5 bucket for the original terms of the first- and second-lien loans
 - Low doc indicators for first- and second-lien loans
 - First-lien loan is an ARM
 - First- and second-lien loans are interest only loans
 - State of the borrower considers the first- and second-lien loans as non-recourse
 - State of the borrower is a judicial state
 - Second-lien loan is a home equity line of credit
 - Second-lien loan is fully drawn
 - Second-lien loan is a credit line and is frozen
 - Second lien loan is a piggyback loan (i.e., originated within two months of the origination of the first lien loan)
 - Indicators for the delinquency month
 - Indicators for the origination year of the first-lien loan

Summary of Results I

- Under Holdup:
 - Higher probability of “no action” (up to +7% - +10%)
 - Lower probability of forced liquidation (up to -7% - -10%)
 - Higher probability of voluntary liquidation (up to +30%)
 - Mixed results for modification
 - Lower probability for PLS (-21%)
 - Higher probability for GSE (+21%)

Economic Effect of Holdup

- What is the economic effect of holdup?
 - Exploitation of first-lien holders
 - Exploitation of borrowers
 - Undoing some of the frictions of securitization (i.e., moving towards “portfolio” ownership Piskorski et al. 2010, Agarwal et al. 2011, Zhang 2012, Adelino et al. 2010)
- Test: Explore performance of first- and second-lien loans after 12 months

Summary of Results II

- Evidence for exploitation of borrowers or 1st lien holders?
- No:
 - No evidence for concessionary modifications
 - For GSE: 1st lien loans perform better after a year by 5%
- Yes:
 - For PLS: 2nd lien loans perform better after a year by 3%

Endogeneity

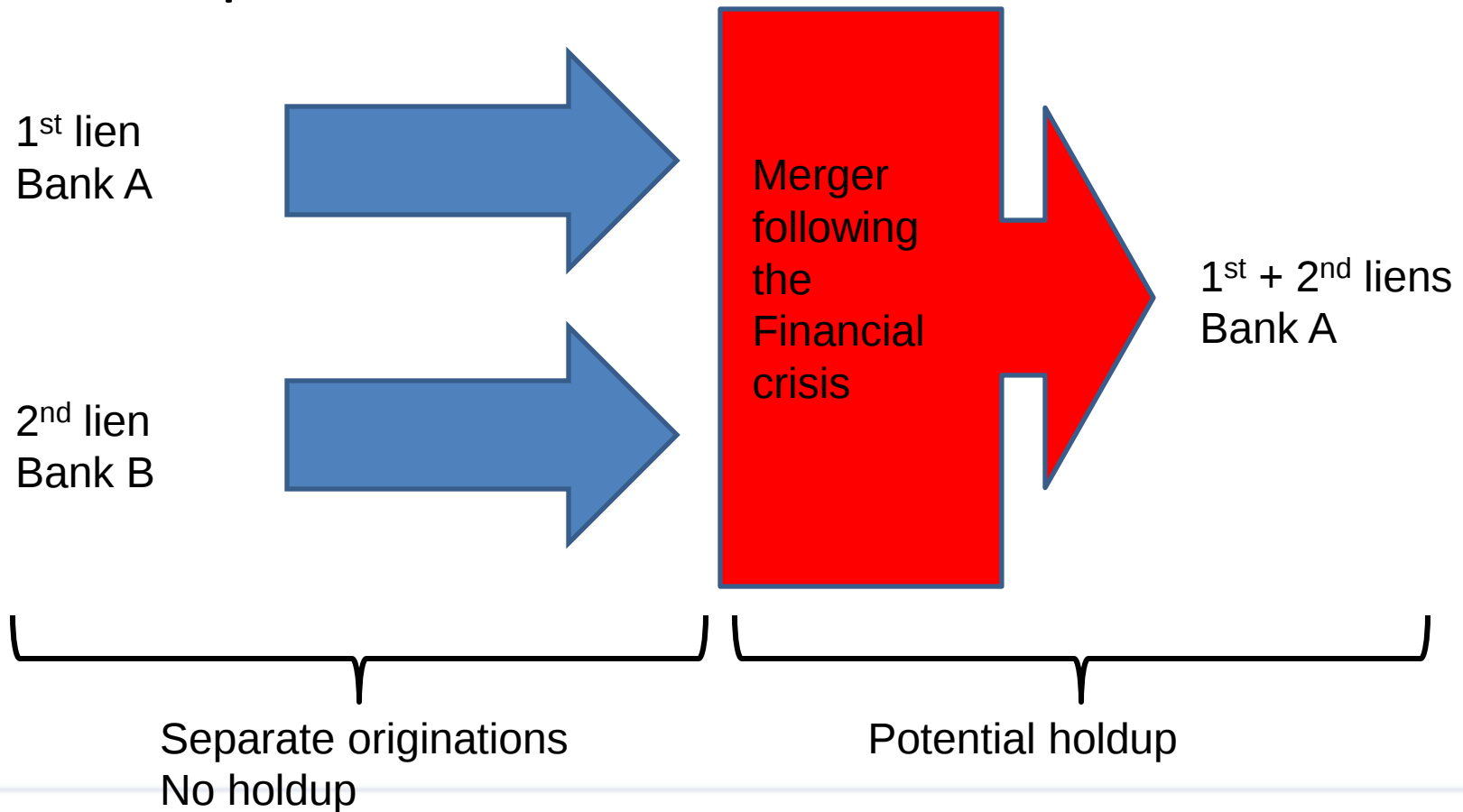
- Servicers could potentially select to service first and second liens; i.e., loans are not randomly allocated to the “holdup” and “no holdup” groups
- Some of the selection stories:
 - 1st and 2nd liens in the “holdup” group are more likely to be originated together (piggybacks)
 - “No holdup” may overrepresent subprime loans (subprime originators less likely to service their own loans)
 - “No holdup” are more likely to be refis (worse loans: Elul et al. 2010)
 - Borrower cooperation more likely when borrower chose to originate 1st and 2nd with same lender

Comparing Holdup and No Holdup

Group	Horizon:	PLS		GSE	
		6 months		6 months	
		Treatment	Control	Treatment	Control
		APAA	APBB	AGAA	AGBB
1st lien is ARM		0.55	0.48	0.19	0.15
1st lien is interest only (IO)		0.35	0.32	0.13	0.11
1st lien is judicial state		0.30	0.30	0.44	0.43
1st lien is low doc		0.62	0.75	0.41	0.56
1st lien is non-recourse		0.56	0.55	0.37	0.37
2nd lien is fully drawn		0.14	0.12	0.11	0.09
2nd lien is HELOC		0.71	0.65	0.60	0.64
2nd lien is interest only (IO)		0.58	0.51	0.46	0.45
2nd lien is low doc		0.94	0.90	0.89	0.89
2nd lien is non-recourse		0.01	0.02	0.03	0.03
2nd lien is piggyback		0.59	0.36	0.52	0.28

Identification

- Example



Preliminary Results: 6-month horizon

6 months GSEs	Holdup			No Holdup			t-test
	N	%	Std Error	N	%	Std Error	
No action	4,352	62.8	0.7	51,701	55.3	0.2	9.9
In foreclosure process		29.9	0.7		27.8	0.2	2.9
Liquidated		0.8	0.1		2.6	0.1	-11.8
Modified		3.0	0.3		6.7	0.1	-13.2
Repayment/Prepaid (incl. voluntary liq)		3.7	0.3		8.5	0.1	-15.3

PLSs							
No action	2,318	62.5	1.0	21,956	50.1	0.3	11.7
In foreclosure process		26.9	0.9		32.4	0.3	-5.6
Liquidated		0.8	0.2		1.9	0.1	-5.7
Modified		7.1	0.5		8.9	0.2	-3.1
Repayment/Prepaid (incl. voluntary liq)		3.2	0.4		7.9	0.2	-11.6

- The difference between the holdup sample and non-holdup sample is statistically significant, and most effects are in the right direction.

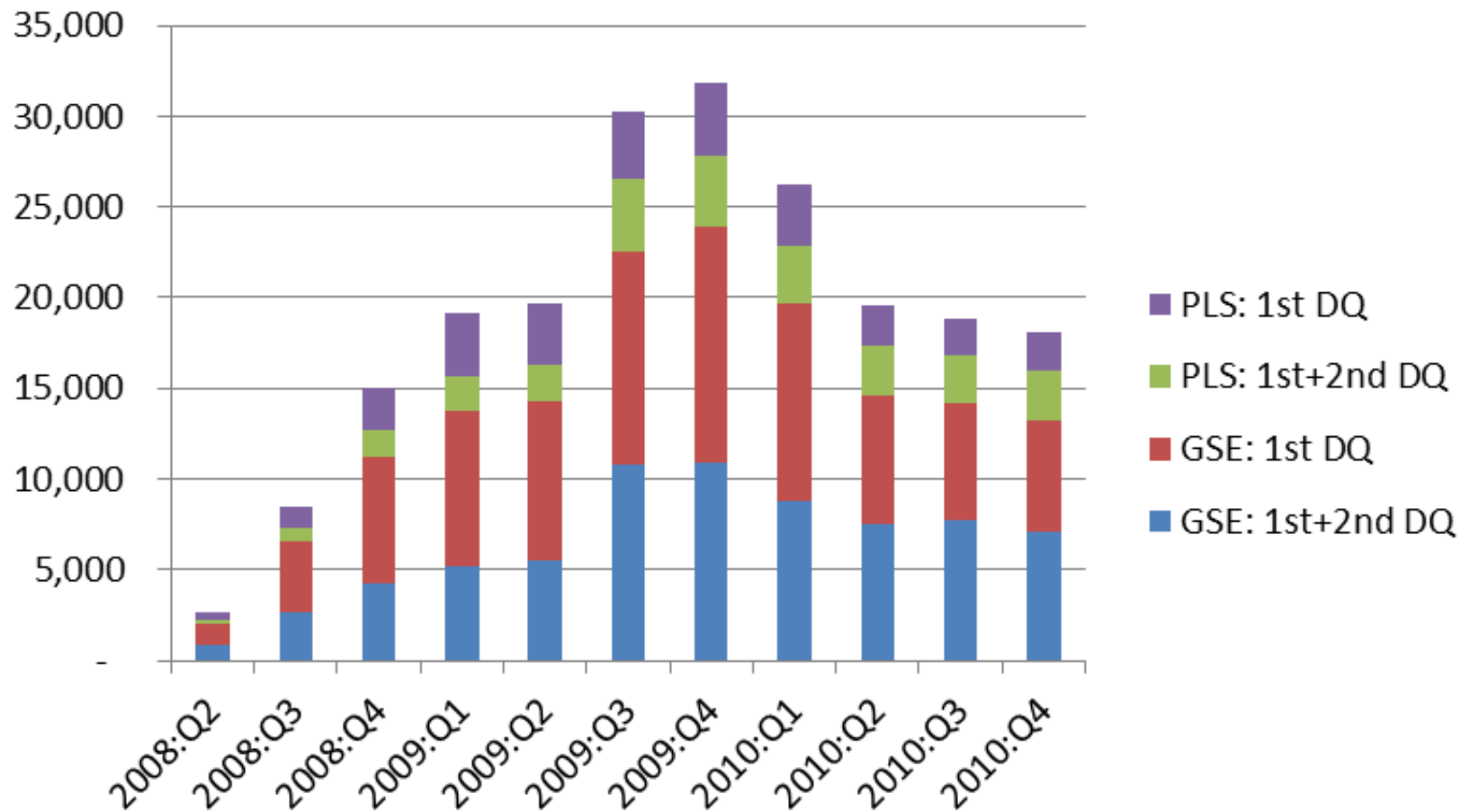
Conclusion

- Evidence for conflict of interest between lien holders and for holdup servicers taking advantage of their decision-making position:
 - More “No Action”
 - Less foreclosures; More short-sales and deed-in-lieu
 - More modifications (GSE), less modifications (PLS)
- Who loses?
 - Little evidence for losses by 1st lien holders
 - Little evidence for losses by borrowers
 - Evidence consistent with holdup servicers encouraging borrowers to stay current on 2nd lien mortgages (but not at the expense of 1st lien performance)
 - Potentially holdup servicers “undo” some of the frictions due to securitization
- Similar evidence for merger experiment

Broader Literature

- Frictions due to securitization
 - Securitized loans are more likely to be liquidated (Piskorski, Seru, and Vig 2010)
 - Securitized loans are less likely to be modified (Agarwal, Amromin, Ben-David, Chomsisengphet, and Evanoff 2011, Zhang 2011)
 - No material difference between securitized loans and portfolio loans (Adelino, Gerardi, Willen 2010)
- Loss resolution following the delinquency wave
 - HAMP program (Agarwal, Amromin, Ben-David, Chomsisengphet, Piskorski, Seru 2012)
 - Private modifications (Agarwal, Amromin, Ben-David, Chomsisengphet, and Evanoff 2011)

Time-Series Distribution of Loans Entering the Sample



No Action

Dependent variable:	No action within...			
Horizon:	6 months		12 months	
Sample:	PLS	GSE	PLS	GSE
	(1)	(2)	(3)	(4)
Unconditional mean	54.9	56.8	41.1	42.8
Holdup (0/1)	4.187*** [7.689]	0.989*** [3.376]	4.030*** [6.622]	1.015*** [3.084]
Observations	53,834	156,137	44,299	128,740
Adj R ²	0.259	0.227	0.277	0.217

Controls: 1st lien controls, 2nd lien controls, 1st lien servicer FE, delinquency month FE

- No action is more likely in holdup sample
- Economic significance:
 - +7% - +10% for PLS
 - +2% for GSE

Liquidation

Dependent variable:	Liquidation + Foreclosure process within...			
Horizon:	6 months		12 months	
Sample restriction:	All mortgages		All mortgages	
Sample:	PLS	GSE	PLS	GSE
	(1)	(2)	(3)	(4)
Unconditional mean	32.1	29.7	37.8	32.7
Holdup	-3.350*** [-6.746]	-2.123*** [-8.106]	-2.692*** [-4.509]	-2.809*** [-9.170]
Observations	53,834	156,137	44,299	128,740
Adj R ²	0.267	0.254	0.281	0.242

Controls: 1st lien controls, 2nd lien controls, 1st lien servicer FE, delinquency month FE

- Liquidation is less likely in holdup sample
- Economic significance:
 - -7% - -10% for PLS
 - -8% for GSE

Liquidation Breakdown

Dependent variable:	Voluntary liquidation		Involuntary liquidation		In foreclosure process	
Horizon:	12 months		12 months		12 months	
Sample restriction:	All mortgages		All mortgages		All mortgages	
Sample:	PLS	GSE	PLS	GSE	PLS	GSE
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional mean	1.7	1.1	5.1	4.9	32.7	27.7
Holdup	0.538*** [3.242]	0.314*** [4.267]	-0.947*** [-4.235]	-0.799*** [-6.122]	-2.283*** [-3.963]	-2.323*** [-7.824]
Observations	44,299	128,740	44,299	128,740	44,299	128,740
Adj R ²	0.204	0.132	0.254	0.186	0.248	0.204

Controls: 1st lien controls, 2nd lien controls, 1st lien servicer FE, delinquency month FE

- Lower probability of involuntary liquidation (-16% - -18%) and foreclosure liquidation (-6% - -8%)
- Higher probability of voluntary liquidation (+28% - +31%). Short sale is better for second-lien holders: they keep their claim (unsecured note) after short sale, but not after foreclosure

Modification

Dependent variable:	Modification within...			
Horizon:	6 months		12 months	
Sample restriction:	All mortgages		All mortgages	
Sample:	PLS	GSE	PLS	GSE
	(1)	(2)	(3)	(4)
Unconditional mean	7.1	6.5	13.8	16.5
Holdup	-1.537*** [-5.457]	1.178*** [7.888]	-1.963*** [-4.626]	1.990*** [8.261]
Observations	53,834	156,137	44,299	128,740
Adj R ²	0.236	0.164	0.305	0.255

Controls: 1st lien controls, 2nd lien controls, 1st lien servicer FE, delinquency month FE

- Modification is lower for PLS (-14% - -21%)
- Modification is higher for GSE (+18% - +21%)
- Result is consistent with both:
 - PSAs in GSE securitizations allow easier modifications
 - PSAs in GSE securitizations allow holdup servicers to exploit investors

Modification Type

Modification type:	Principal defer (1)	Principal writedown (2)	Capitalization (3)	Interest rate reduction (4)	Interest rate frozen (5)	Term extension (6)	Change in interest rate diff (premod- postmod) (7)	Change in interest rate percent ((premod- postmod)/premod) (8)
Sample:	GSE: First-lien was modified							
Holdup	-1.494** [-2.266]	0.021 [0.590]	-0.984 [-1.505]	-1.080 [-1.212]	-0.041 [-0.082]	-1.104 [-1.058]	-0.092*** [-2.622]	-1.345** [-2.380]
Observations	21,211	21,211	21,211	21,211	21,211	21,211	21,211	21,211
Adj R ²	0.331	0.088	0.554	0.526	0.508	0.447	0.537	0.543
Sample:	PLS: First-lien was modified							
Holdup	1.042 [0.770]	-0.519 [-1.292]	0.812 [0.403]	-1.041 [-0.433]	-0.149 [-0.110]	3.941 [1.634]	-0.117 [-1.361]	-0.914 [-0.692]
Observations	6,116	6,116	6,116	6,116	6,116	6,116	6,116	6,116
Adj R ²	0.529	0.892	0.677	0.631	0.577	0.628	0.633	0.626

Controls: 1st lien controls, 2nd lien controls, 1st lien servicer FE, delinquency month FE

- No material difference in modification types
- No evidence for concessionary modifications
 - Interest reduction is slightly more aggressive for holdup servicers (-10 bps)

Performance of 1st Lien

Dependent variable:	First-lien loan performs after...			
Horizon:	12 months		12 months	
Sample restriction:	No action taken at month = 6		Modified loans at month = 6	
Sample:	PLS	GSE	PLS	GSE
	(1)	(2)	(3)	(4)
Unconditional mean	24.0	35.4	62.4	75.4
Holdup	-0.385 [-0.568]	1.613*** [3.992]	5.912 [1.551]	0.602 [0.366]
Observations	28,558	85,400	3,530	9,435
Adj R ²	0.399	0.314	0.780	0.692
Controls: 1st lien controls, 2nd lien controls, 1st lien servicer FE, delinquency month FE				

- GSE 1st lien loans perform better by 5%

Performance of 2nd Lien

Dependent variable:		Second-lien loan performs after...					
Horizon:		12 months		12 months		12 months	
Sample restriction:		All loans		No action taken at month = 6		Modified loans at month = 6	
Sample:		PLS	GSE	PLS	GSE	PLS	GSE
		(1)	(2)	(3)	(4)	(5)	(6)
Unconditional mean		68.4	73.5	73.9	78.1	80.3	86.3
Holdup		2.117***	0.185	2.194*	-0.490	0.525	0.172
		[2.642]	[0.483]	[1.899]	[-1.008]	[0.111]	[0.0897]
Observations		25,948	78,077	15,177	49,961	2,481	7,206
Adj R ²		0.361	0.261	0.424	0.287	0.776	0.641

Controls: 1st lien controls, 2nd lien controls, 1st lien servicer FE, delinquency month FE

- PLS 2nd liens perform better by 3%
 - Effect due to “No Action”, not “Concessionary Modification”
 - Consistent with PLS holdup servicers encouraging borrowers to stay current on their 2nd lien loans. E.g., in exchange for no action or voluntary liquidation

Preliminary Results: 12-month horizon

12 months GSEs	Holdup			No Holdup			t-test
	N	%	Std Error	N	%	Std Error	
No action	3,263	51.8	0.9	42,360	40.5	0.2	12.5
In foreclosure process		32.4	0.8		27.9	0.2	5.3
Liquidated		2.3	0.3		5.5	0.1	-11.4
Modified		9.5	0.5		17.2	0.2	-14.2
Repayment/Prepaid (incl. voluntary liq)		4.8	0.4		11.7	0.2	-17.1

PLSs							
No action	1,776	50.6	1.2	18,468	36.1	0.4	11.7
In foreclosure process		30.9	1.1		33.9	0.3	-2.6
Liquidated		1.8	0.3		5.5	0.2	-10.4
Modified		13.5	0.8		16.3	0.3	-3.2
Repayment/Prepaid (incl. voluntary liq)		3.8	0.5		11.0	0.2	-14.1

Identification

- The goal is to find situations in which there is holdup (i.e., the same servicer for 1st and 2nd liens), however, loans were originated with the intention to be serviced by the same servicer
- Identification: Following the financial crisis, servicing businesses of some banks were bought by other banks
 - E.g., Wells Fargo acquired the servicing business of Wachovia
 - Two such banks are in our data
 - Identifying assumption: The choice of which bank bought which other bank is unrelated to the content of the servicing portfolio. This makes sense, since these banks have many operations; servicing mortgages is a small part of the operation. Furthermore, the number of 1st+2nd lien loans that we are able to identify is relatively small – indicating that this cannot be possibly the reason for the merger.

Identification (cont'd)

- Our “holdup” sample is composed of loans in which:
 - One lien was originally serviced by the acquirer
 - The other lien was originally serviced by the target
- After the acquisition, both liens are serviced by the acquirer
 - These loans are exposed to holdup
 - However, these loans are not subject to the endogeneity concerns
- Before the merger, these loans look exactly like those in “no holdup” group
 - Almost by chance they ended up at the same servicer
 - Endogeneity concerns about selection in origination are eliminated
- We compare the new “holdup” group to the “no holdup” group