# 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 $1^{st}$-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 |

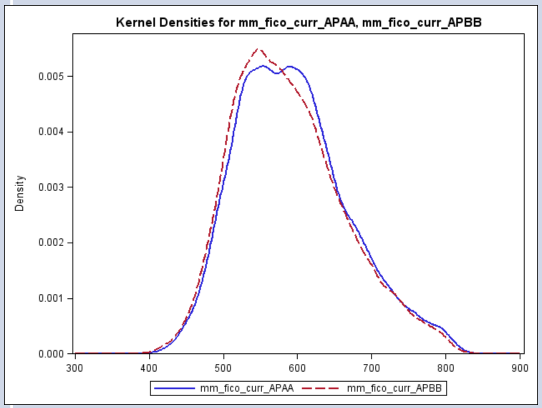
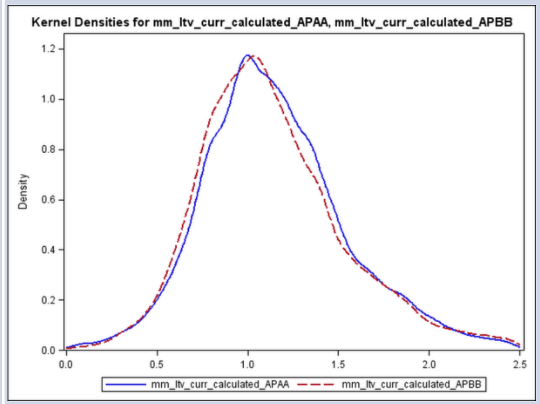
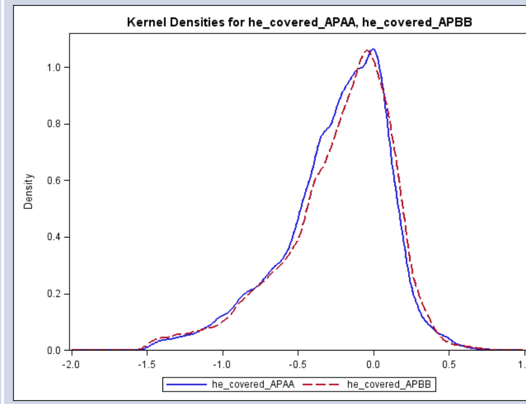
**No Holdup**

- 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

<table>
<tr><th></th><th>FICO</th><th>LTV (1$^{st}$ lien)</th><th>LTV (2$^{nd}$ lien)-Balance(1$^{st}$ lien)</th></tr>
<tr><td>PLS</td><td>
</td><td>
</td><td>
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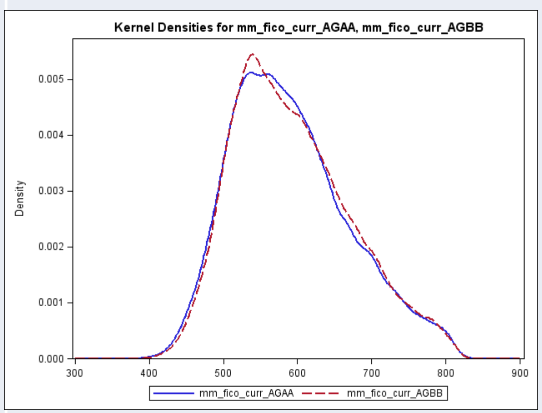
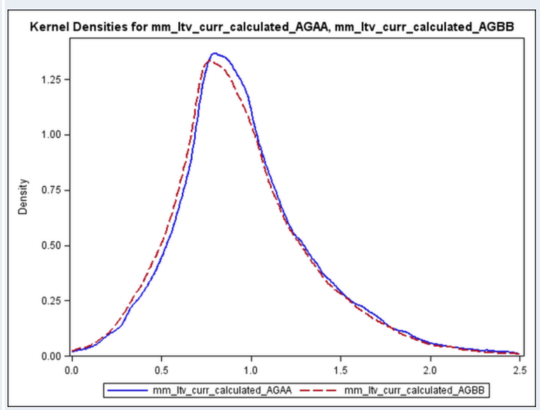
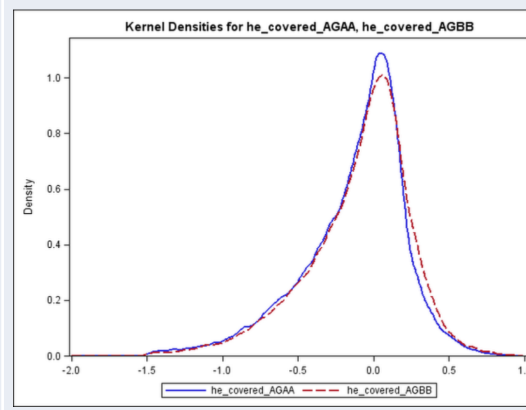
<tr><td>GSE</td><td>
</td><td>
</td><td>
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Agarwal, Amromin, Ben-David, Chomsisengphet, Zhang
Second Liens and Holdup

# 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

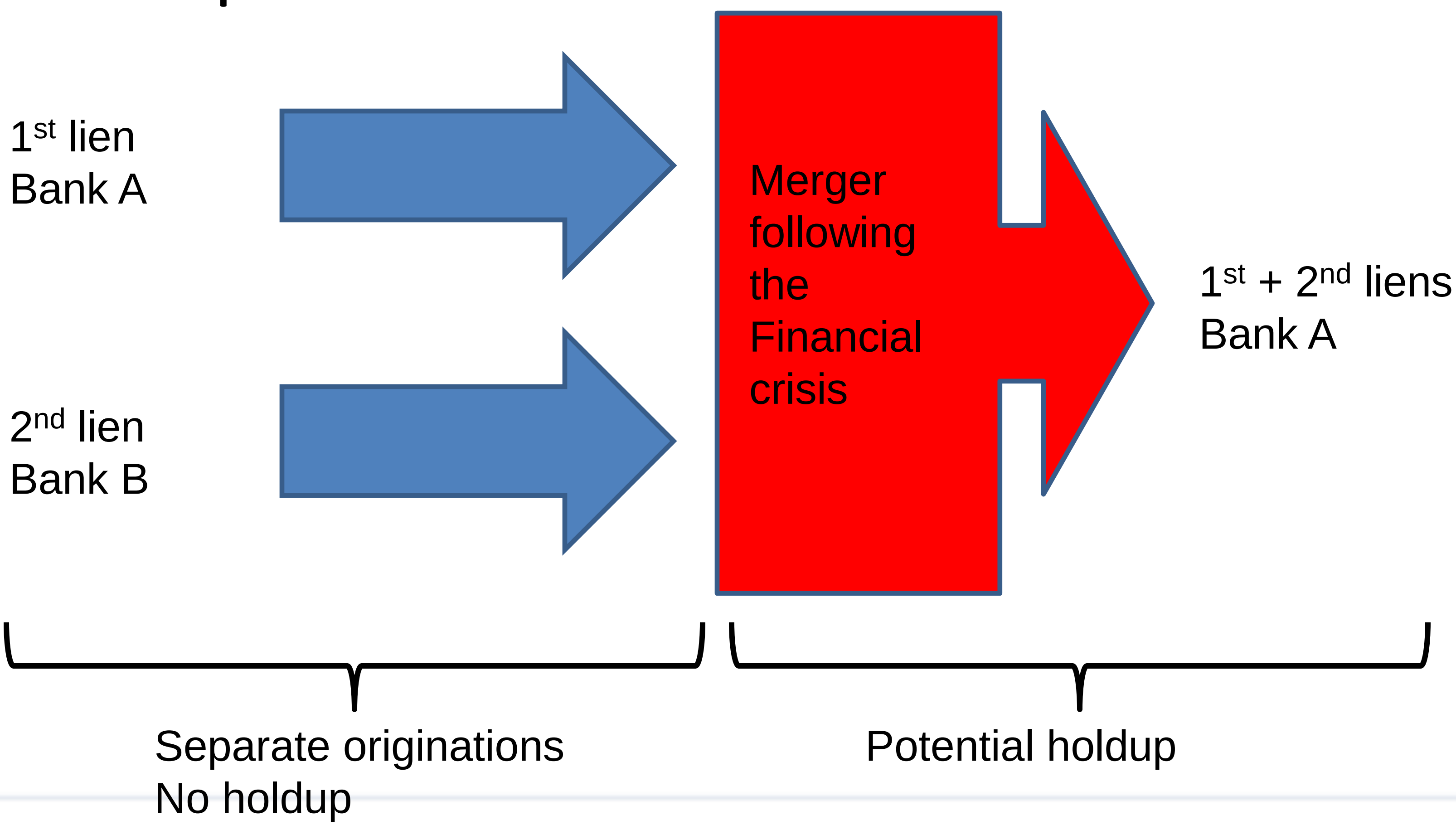
- Some of the selection stories:
  - 1st and 2nd liens in the "holdup" group are more likely to be originated together (piggybacks)
  - "No holdup" may overrepresent subprime loans (subprime originators less likely to service their own loans)
  - "No holdup" are more likely to be refis (worse loans: Elul et al. 2010)
  - Borrower cooperation more likely when borrower chose to originate 1st and 2nd with same lender

# Comparing Holdup and No Holdup

| | PLS | | GSE | |
|---|---|---|---|---|
| Horizon: | 6 months | | 6 months | |
| | Treatment | Control | Treatment | Control |
| Group | 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 | Holdup | | | No Holdup | | | |
|---|---|---|---|---|---|---|---|
| GSEs | N | % | Std Error | N | % | Std Error | t-test |
| 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

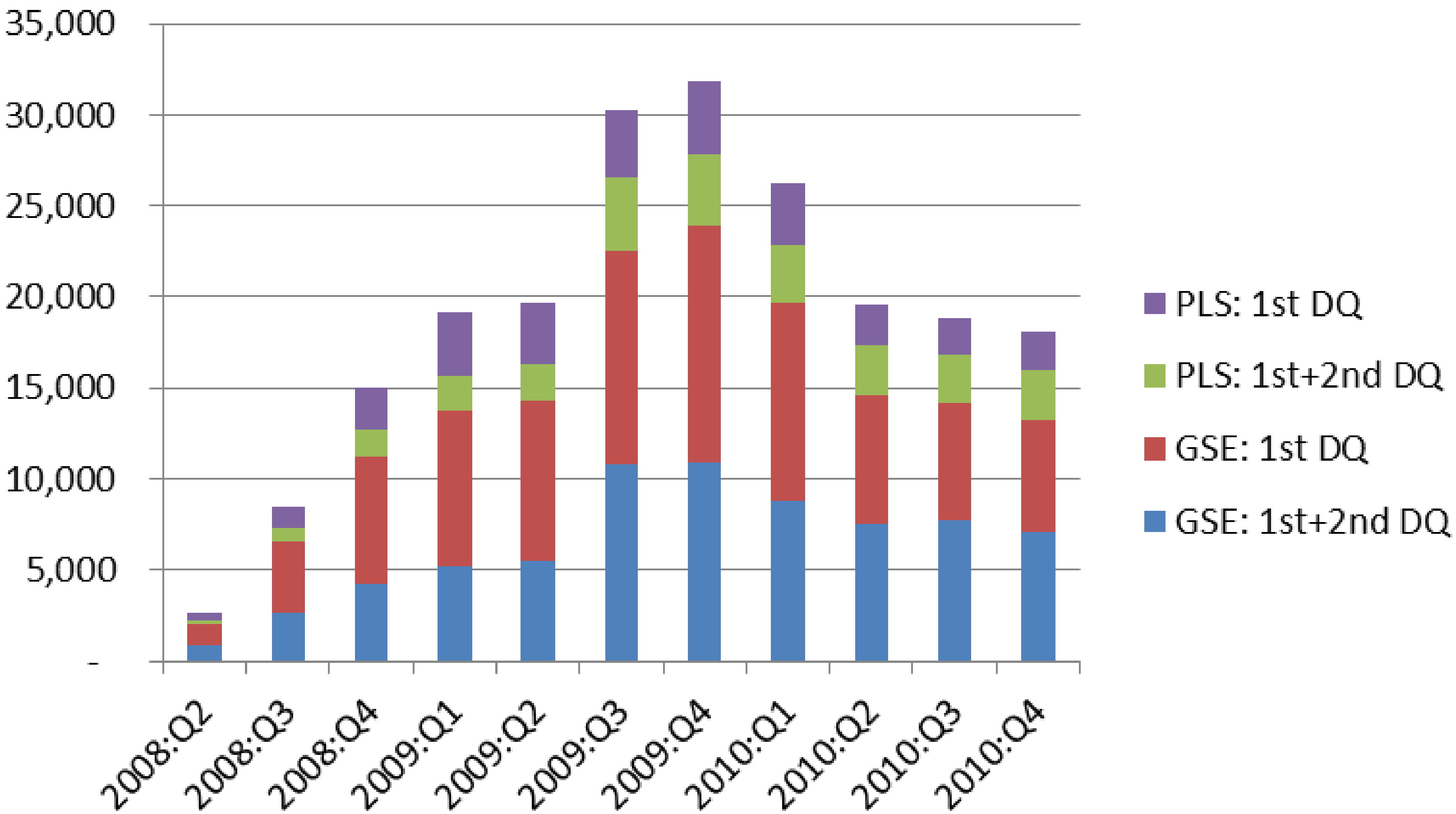
- Similar evidence for merger experiment

# 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*** | 0.989*** | 4.030*** | 1.015*** |
| | [7.689] | [3.376] | [6.622] | [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*** | -2.123*** | -2.692*** | -2.809*** |
| | [-6.746] | [-8.106] | [-4.509] | [-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*** | 0.314*** | -0.947*** | -0.799*** | -2.283*** | -2.323*** |
| | [3.242] | [4.267] | [-4.235] | [-6.122] | [-3.963] | [-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 (unsercured 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*** | 1.178*** | -1.963*** | 1.990*** |
| | [-5.457] | [7.888] | [-4.626] | [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 | Principal writedown | Capitalization | Interest rate reduction | Interest rate frozen | Term extension | Change in interest rate diff (premod-postmod) | Change in interest rate percent ((premod-postmod)/premod) |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Sample: | GSE: First-lien was modified | | | | | | | |
| Holdup | -1.494** | 0.021 | -0.984 | -1.080 | -0.041 | -1.104 | -0.092*** | -1.345** |
| | [-2.266] | [0.590] | [-1.505] | [-1.212] | [-0.082] | [-1.058] | [-2.622] | [-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 | -0.519 | 0.812 | -1.041 | -0.149 | 3.941 | -0.117 | -0.914 |
| | [0.770] | [-1.292] | [0.403] | [-0.433] | [-0.110] | [1.634] | [-1.361] | [-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 $1^{st}$ 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 | 1.613*** | 5.912 | 0.602 |
| | [-0.568] | [3.992] | [1.551] | [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 $1^{st}$ 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 | Holdup | | | No Holdup | | | |
|---|---|---|---|---|---|---|---|
| GSEs | N | % | Std Error | N | % | Std Error | t-test |
| 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