Market-Based Loss Mitigation Practices for Troubled Mortgages Following the Financial Crisis

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Motivation and Research Questions

- Falling home prices + recession unleashed a wave of delinquencies
- Until February 2009 (HAMP unveiled), there was no single large-scale federal effort to define the remediation process for troubled loans
- Research questions:
  - How did the private market address the wave of delinquencies and defaults?
  - To what extent did loss mitigation and loan modification practices vary across servicers?
  - What works, what does not? In particular, what affects redefault rates following modification?

Main Results: loss mitigation resolutions

- Within 6 months of becoming "in trouble", the majority of delinquent loans do not enter any loss mitigation program
- Foreclosure is by far the dominant form of loss mitigation
- Over time, the foreclosure process takes longer
- Large variation in mitigation practices across servicers and time
- Loan modifications account for the majority of non-foreclosure resolutions
- Securitized loans are less likely to receive loan modifications within the 6-month window
  - −3 ppt for private label MBS relative to portfolio loans (10.4% base)
- Loans with highest ex ante probability of self-cure are also less likely to get modified
  - Borrowers with high FICO scores and low LTV ratios at time of default

Main results: loan modifications

- Concessionary (e.g. interest rate reductions and principal forgiveness) and non-concessionary (e.g. capitalization and term extensions) modifications are about equally likely
  - Among concessionary modifications, principal writedowns are rare
- Convergence over time
- Redefault following modification appears to be strongly associated with changes in mortgage affordability
  - A reduction in mortgage interest rate by an extra 100 basis points implies a 4 percentage point reduction in the likelihood of redefault
- These findings are consistent with HAMP emphasis on mortgage affordability

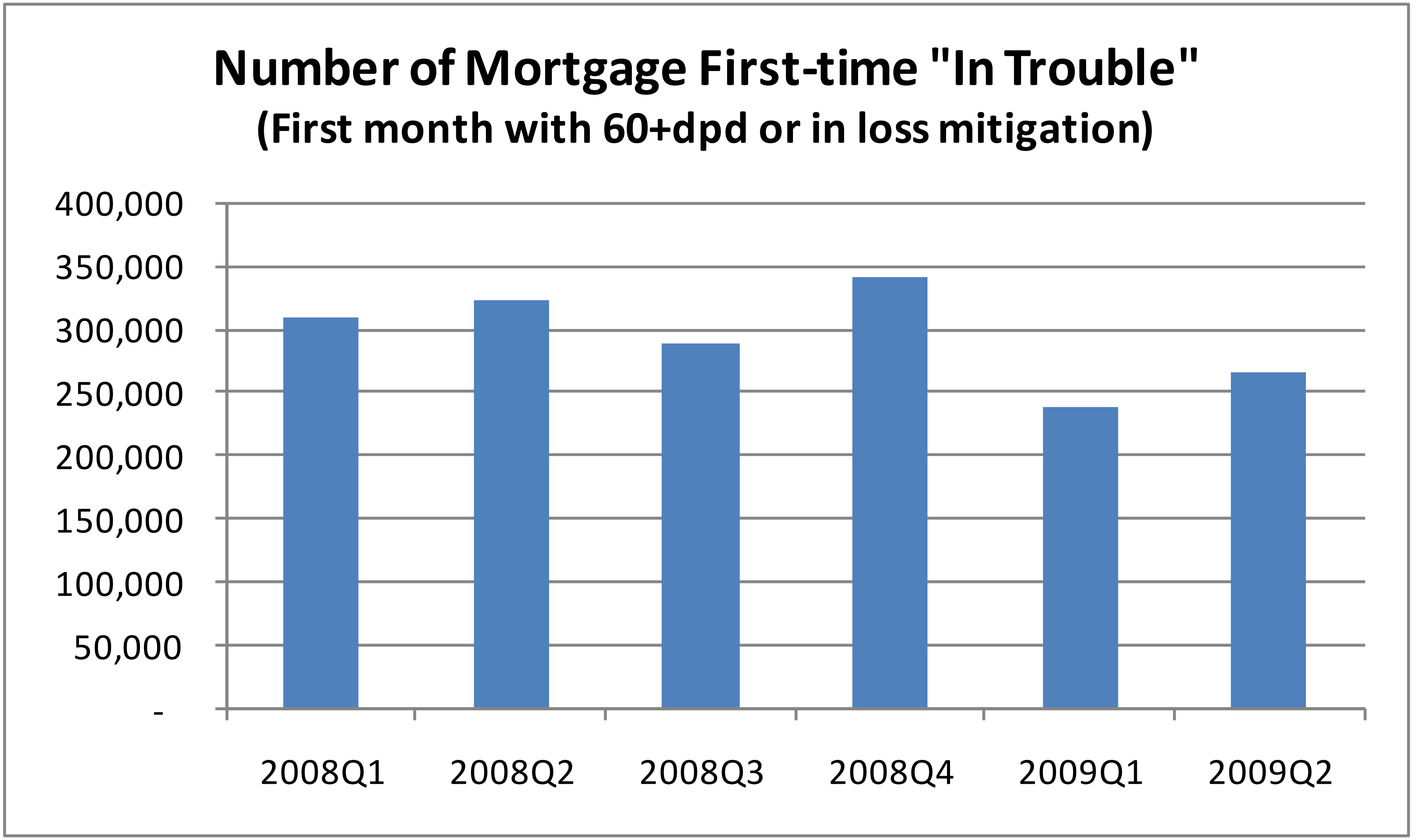
Data

- OCC-OTS data: Mortgage Metrics database
- Overall, about 34m loans per month; 64% of the mortgage universe
- January 2008 to May 2009
- Includes servicing and loss mitigation information from 12 large banks (19 servicer entities)
- Loans under analysis are kept in originators' portfolios (40%), or securitized by GSEs (34%) or private-label securitizers (26%)

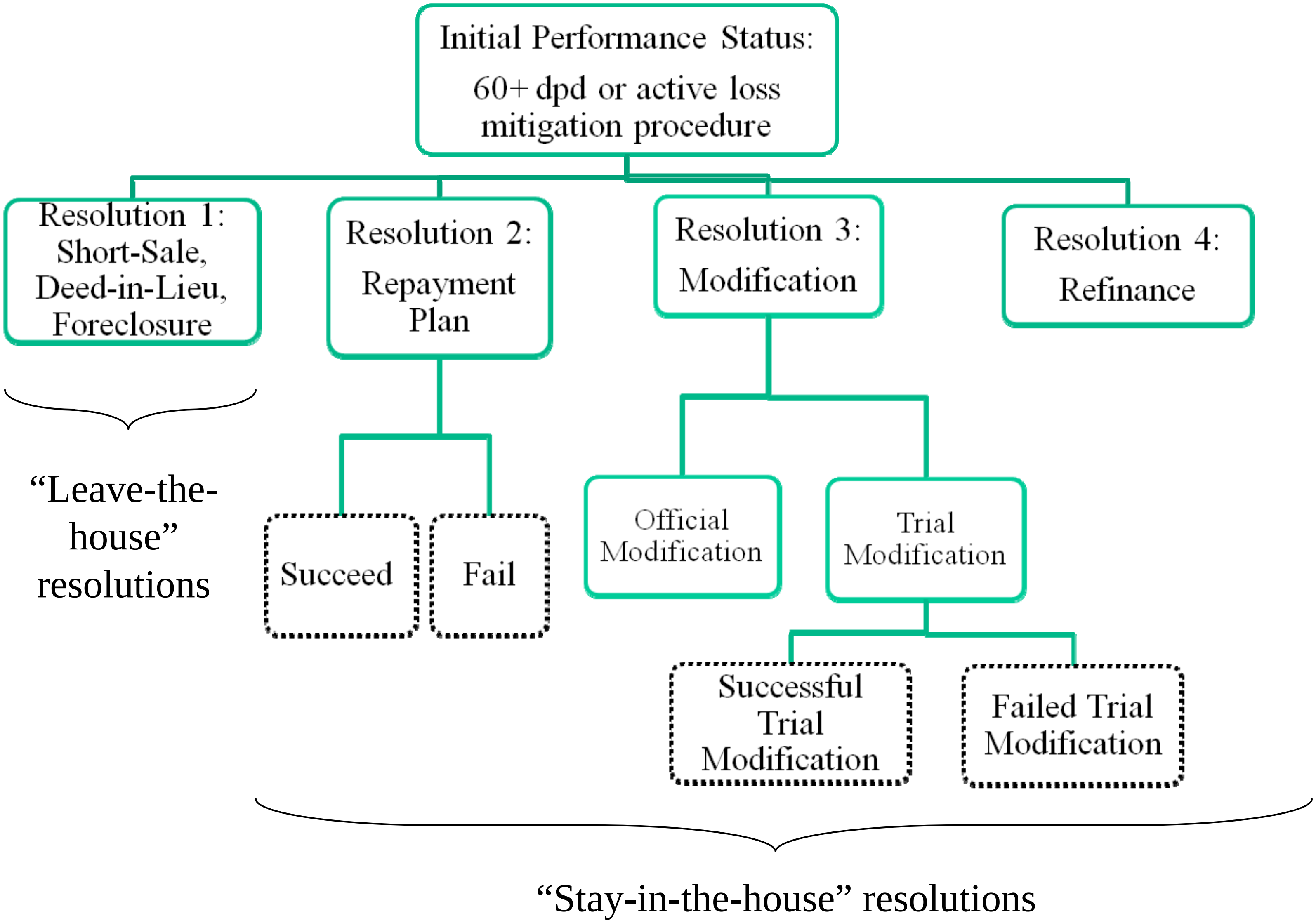
Who is in the "In trouble" sample?

- Loans must be current in 2007:Q4
- Loans "in trouble":
  - 60+ dpd
  - Flagged as being in a loss mitigation program
- Overall 1.7 million unique loans in trouble
- We track each loan that enters the sample and document the resolution within X months
  - For 6-month window analysis, we look only at mortgages that enter the "in trouble" sample in 2008

Constant arrival of “In trouble” mortgages



Outcomes of Loss mitigation process

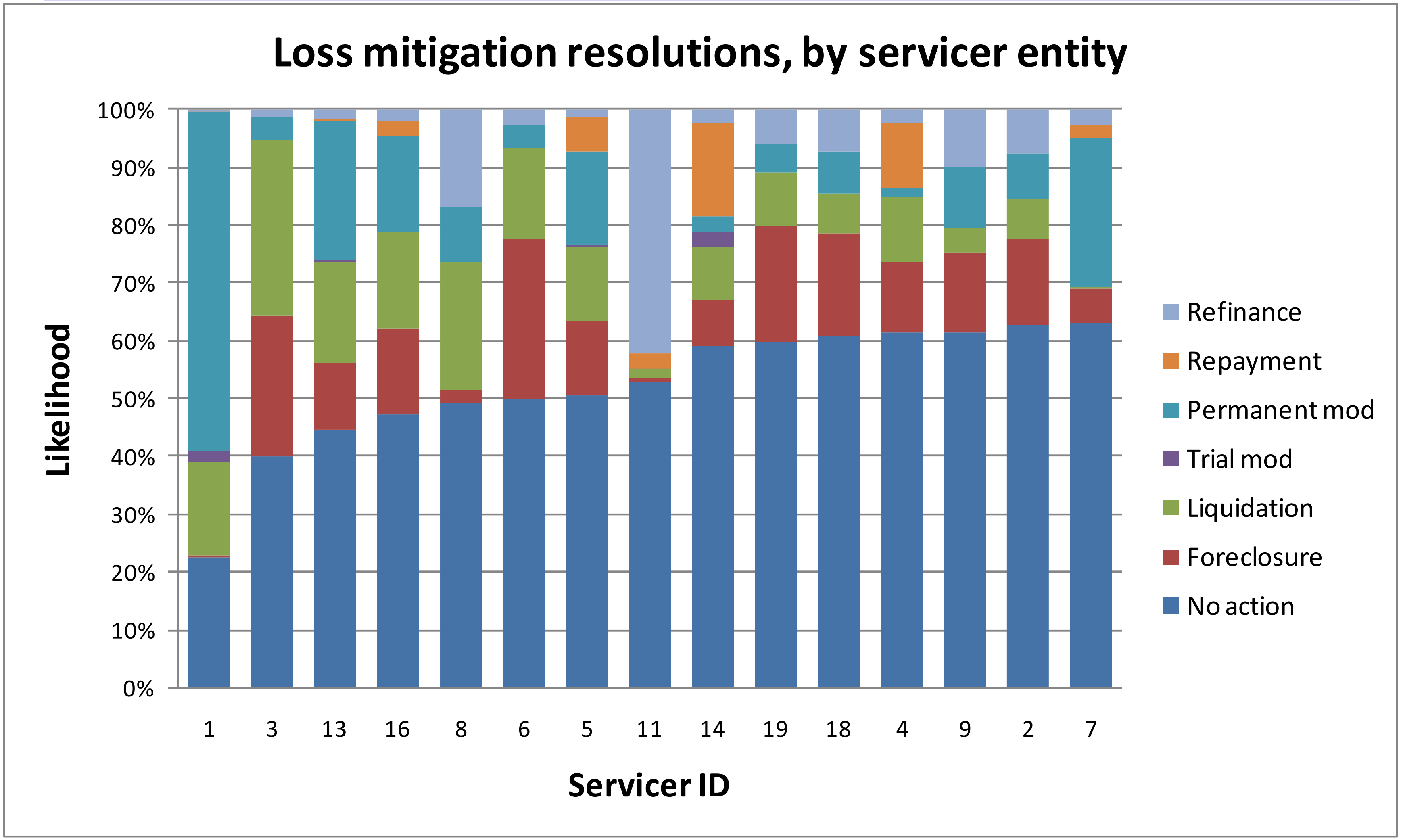


Resolutions within 6 months

Quarter:	2008Q1	2008Q2	2008Q3	2008Q4	Total 2008
# Borrowers in trouble in cohort:	309,356	322,498	287,799	341,935	1,261,588
In Foreclosure process	16.4%	19.5%	23.9%	28.4%	22.2%
Liquidation	16.1%	9.1%	5.0%	3.8%	8.4%
Total "Leave the house"	32.5%	28.6%	28.9%	32.2%	30.6%
Repayment	2.0%	1.8%	2.6%	3.2%	2.4%
Modification	9.4%	9.7%	9.4%	12.7%	10.4%
Refinance	2.1%	2.5%	1.8%	2.2%	2.2%
Total "Stay in the house"	13.5%	14.0%	13.8%	18.1%	15.0%
No action	54.0%	57.4%	57.3%	49.7%	54.4%

- **Over time, foreclosure takes longer**
- **Majority of troubled loans are untouched during the first 6 months**

Resolution choices across servicers



- **Is all of this variation due to differences in borrower population?**

Determinants of “Leave the house” resolutions

	Within 6 months (0/1)		
	"Leave the house"	Liquidation	Foreclosure initiation
Securitizer is GSE	-0.003	-0.004	0.002
Securitizer is private	-0.001	-0.038	0.037
Second lien	0.107	0.125*	-0.018
Borrower is non-occupier	0.082***	0.027***	0.055***
Low doc mortgage	0.032	0.022	0.010
Stated income mortgage	0.051***	0.013*	0.038**
Mortgage is ARM	0.081***	0.031**	0.050***
Change in unemployment (%)	0.091***	0.038*	0.053**
Change in home prices since origination (%)	-0.144***	-0.032*	-0.112***
log(sum(unpaid balance per lender-zip code))	0.001	0.000	0.001
Share of servicer's modified loans in zipcode	-0.019*	0.010***	-0.028**
Observations	834944	834944	834944
Adj. R^2	0.155	0.184	0.197
Adj. R^2 without servicer FE	0.075	0.132	0.128

Fixed effects: FICO bucket, LTV bucket, origination cohort, calendar month, servicer entity

- Liquidating resolutions are more likely for borrowers with poor prospects and low equity stakes
  - Stated income, high unemployment, greater declines in area housing prices, low FICO
  - Investors, low equity in the house (high LTV at time of foreclosure)

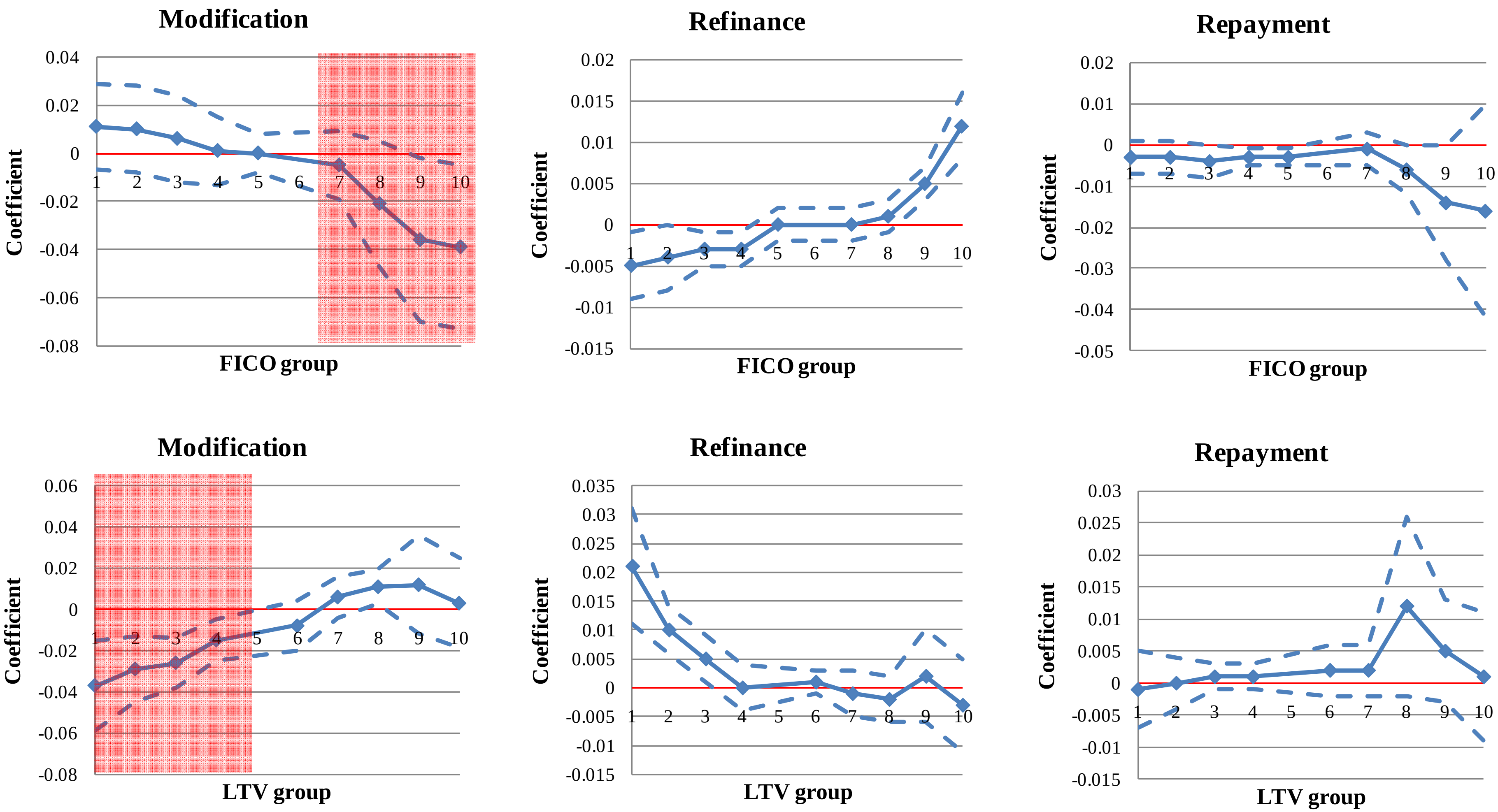
Determinants of "Stay in the house" resolutions

	Within 6 months (0/1)			
	"Stay in the house"	Repayment	Modification	Refinance
Securitizer is GSE	-0.029	0.035*	-0.066**	0.002
Securitizer is private	-0.024	0.010	-0.031**	-0.002
Second lien	-0.142***	-0.029	-0.113***	-0.001
Borrower is non-occupier	-0.051***	-0.011**	-0.042***	0.002*
Low doc mortgage	-0.009	0.024*	-0.029***	-0.004
Stated income mortgage	-0.021***	0.003	-0.016***	-0.008**
Mortgage is ARM	-0.083**	-0.007	-0.080**	0.004*
Change in unemployment (%)	0.016	0.001	0.018	-0.003
Change in home prices since origination (%)	0.029	0.018*	-0.007	0.018
log(sum(unpaid balance per lender-zip code))	-0.001	-0.000	-0.000	-0.001
Share of servicer's modified loans in zipcode	0.017	0.007	0.010*	0.000
Observations	834944	834944	834944	834944
Adj. R^2	0.083	0.055	0.075	0.112
Adj. R^2 without servicer entity FE	0.047	0.030	0.031	0.017

- Loan modifications are <u>more</u> likely for portfolio loans
- Borrowers with ex ante higher likelihood of self-curing are <u>less</u> likely to get loan modifications (and more likely to get refinanced)

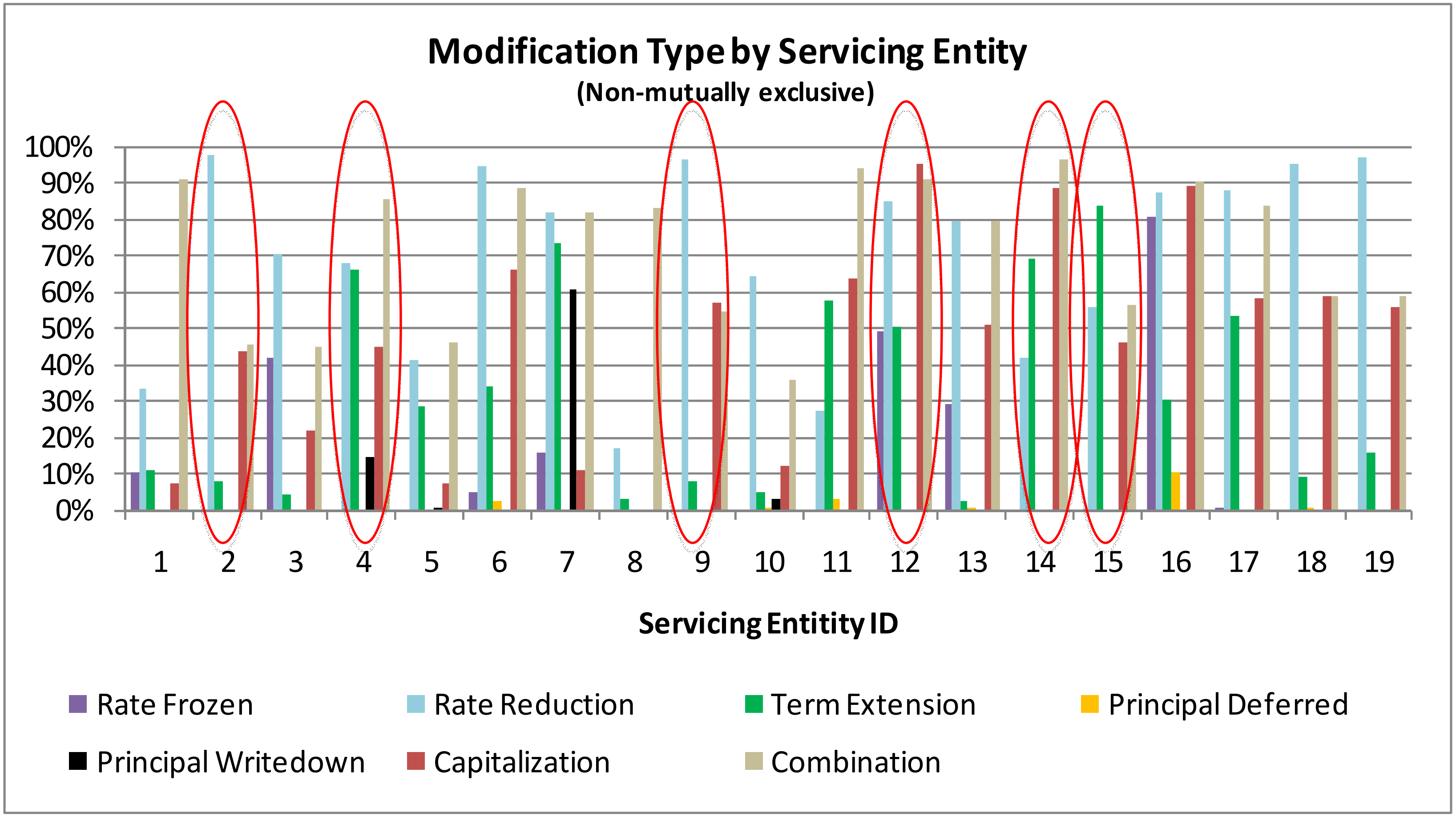
- **Servicer-specific choices have a big effect on resolution decisions**

Determinants of "staying in the house"



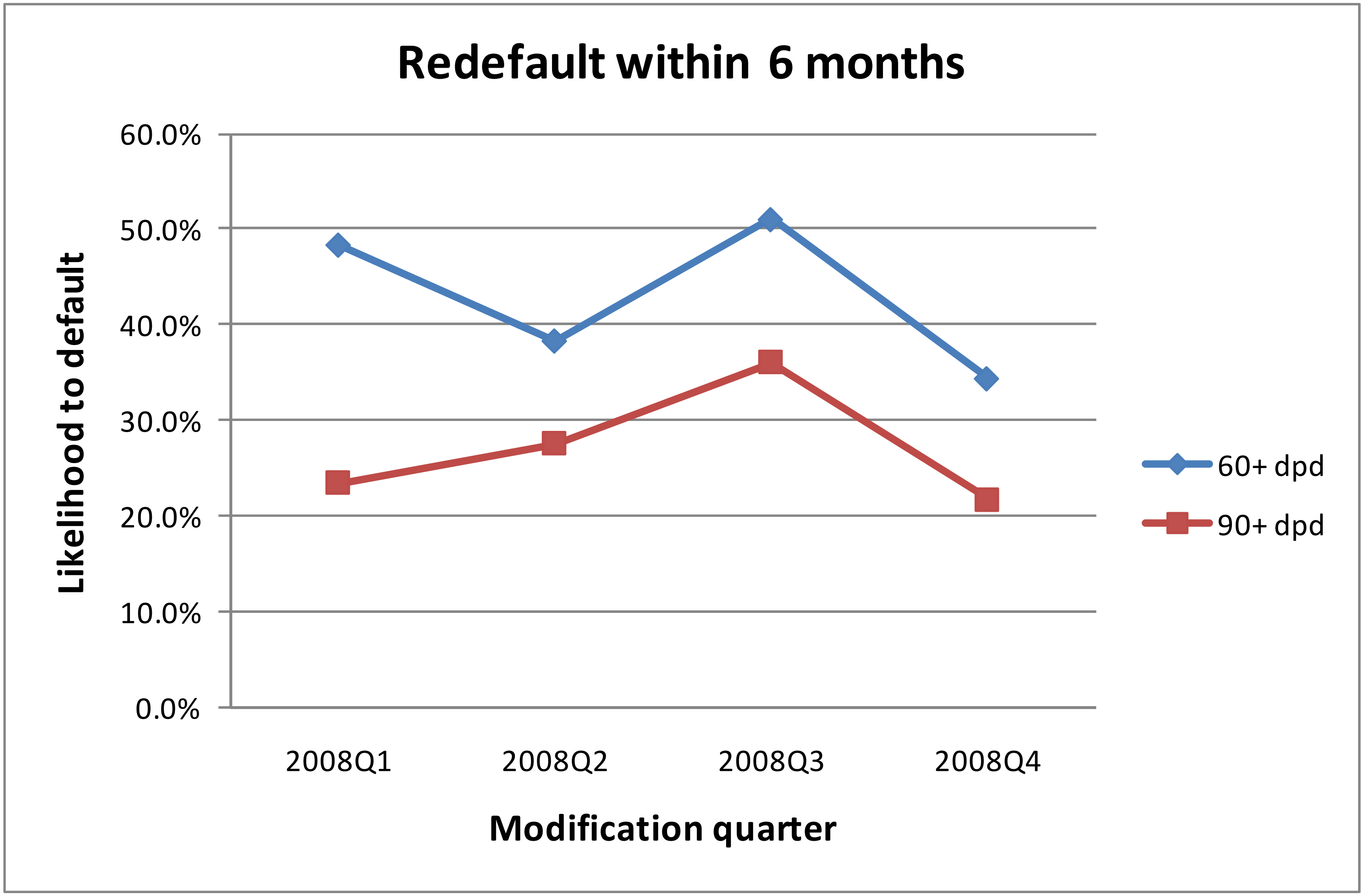
- Higher FICO scores and lower LTV ratios at default – smaller likelihood of loan modifications

How did loans get modified?

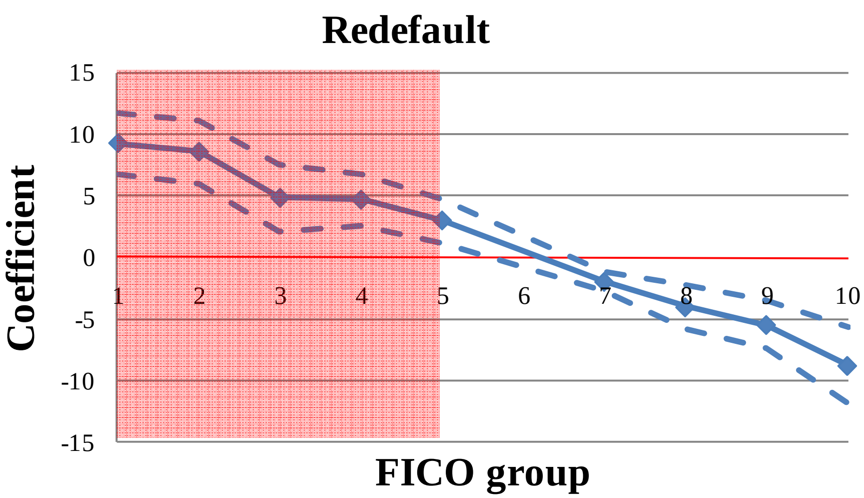


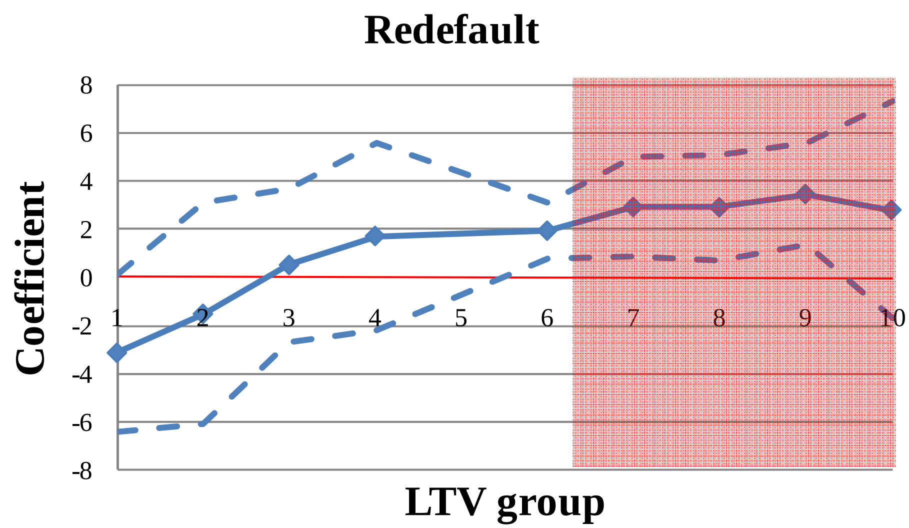
- Substantial heterogeneity in the choice of terms to modify

Redefault following modification



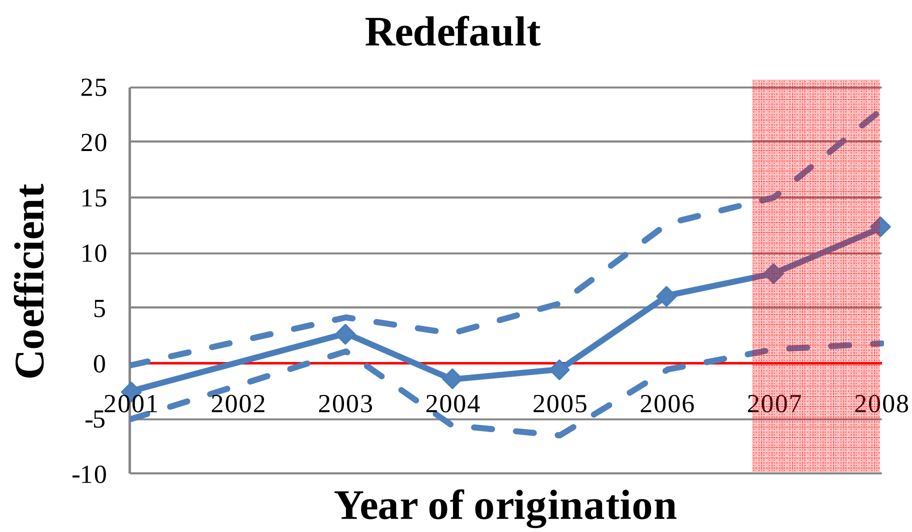
Who redefaults following modification?





- Borrowers more likely to redefault:
  - Low FICO borrowers
  - 2007-2008 originations
  - Higher LTV (small effect)

- FICO is 2.5 times more important than LTV



Redefault and modification terms

	Redefault (60+ dpd) within 6 months (0/1) × 100			
	(1)	(2)	(3)	(4)
Change in payment (%)	0.284***			
Change in rate (bps)		0.039***		
Change in balance (%)			0.062	
Change in term (months)				1.328
Securitizer is GSE	-1.311	-1.259	1.434	2.990
Securitizer is private	1.425	1.907	-0.144	1.543
Second lien	0.046	1.399	0.897	0.255
Borrower is non-occupier	2.821***	1.597	1.838	1.784
Low doc mortgage	2.597**	4.115***	3.416***	3.232***
Stated income mortgage	-0.250	0.652	0.062	-0.681
Mortgage is ARM	6.481**	8.502*	8.792	9.429
Change in unemployment (%)	-1.212	-1.103	-1.358	-2.477***
Change in home prices since origination (%)	23.402**	30.289**	29.867**	17.638
log(sum(unpaid balance per lender-zip code))	-0.100	-0.045	-0.048	-0.146**
Share of servicer's modified loans in zipcode	3.431***	1.869**	1.967**	1.519
Observations	14337	62806	63164	63164
Adj R^2	0.110	0.135	0.116	0.116
Adj. R^2 without servicer entity FE	0.082	0.096	0.067	0.075

Fixed effects: FICO bucket, LTV bucket, origination cohort, calendar month, servicer family

- 1 stdev greater reduction in monthly payment – 6 ppt decline in redefault

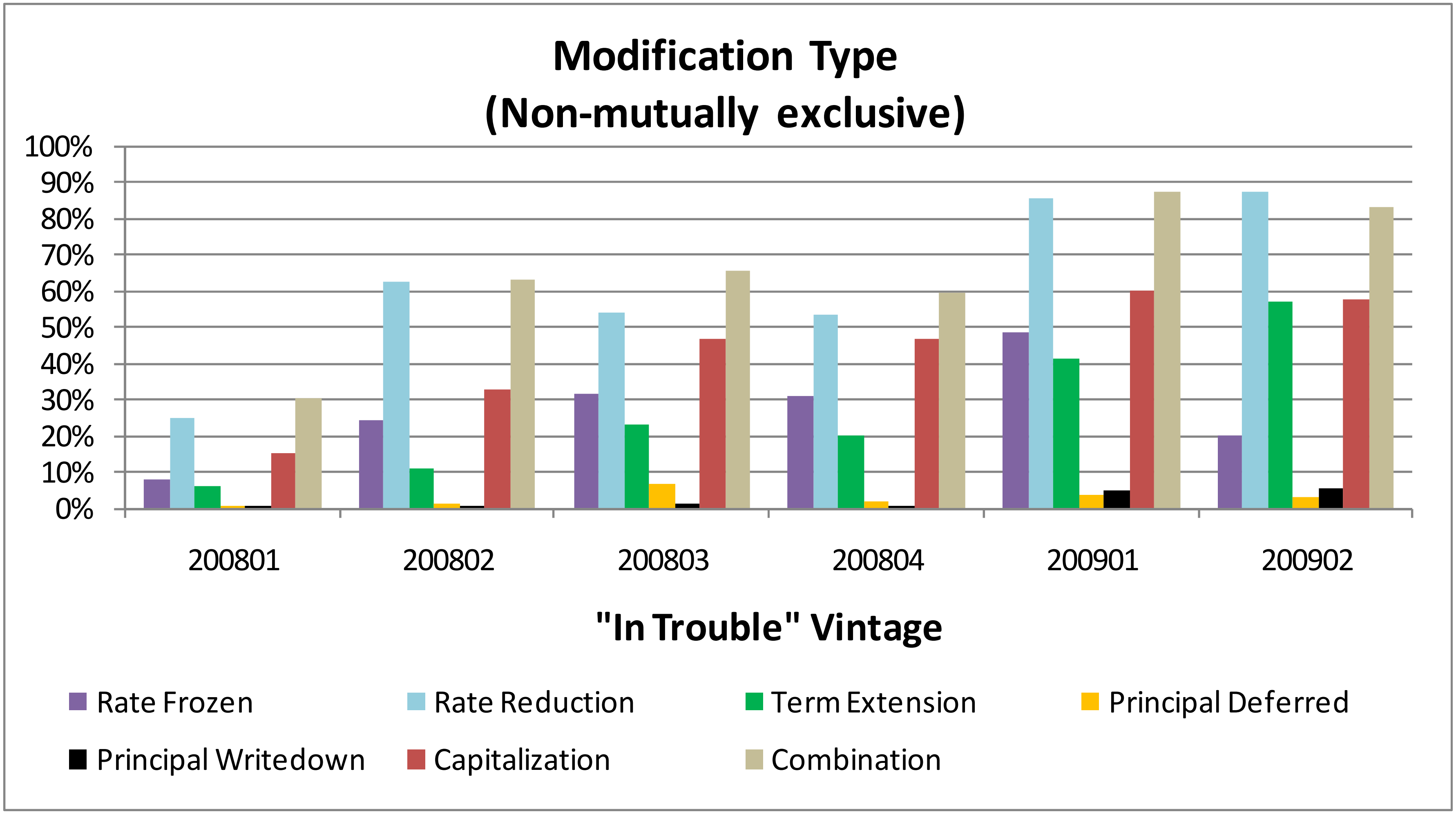
Conclusion

- For more than half of delinquency cases, there is no recorded action within 6 months
- Over time, foreclosure process takes longer, potentially due to system congestion
- There is large variation in resolution types and modification terms across servicers, not accounted for by borrower differences
- Affordability appears to be a first order factor in redefault – this is consistent with the working assumption of HAMP
- Future work:
  - How did HAMP change the loan modification market?
  - Learning by doing (servicers)

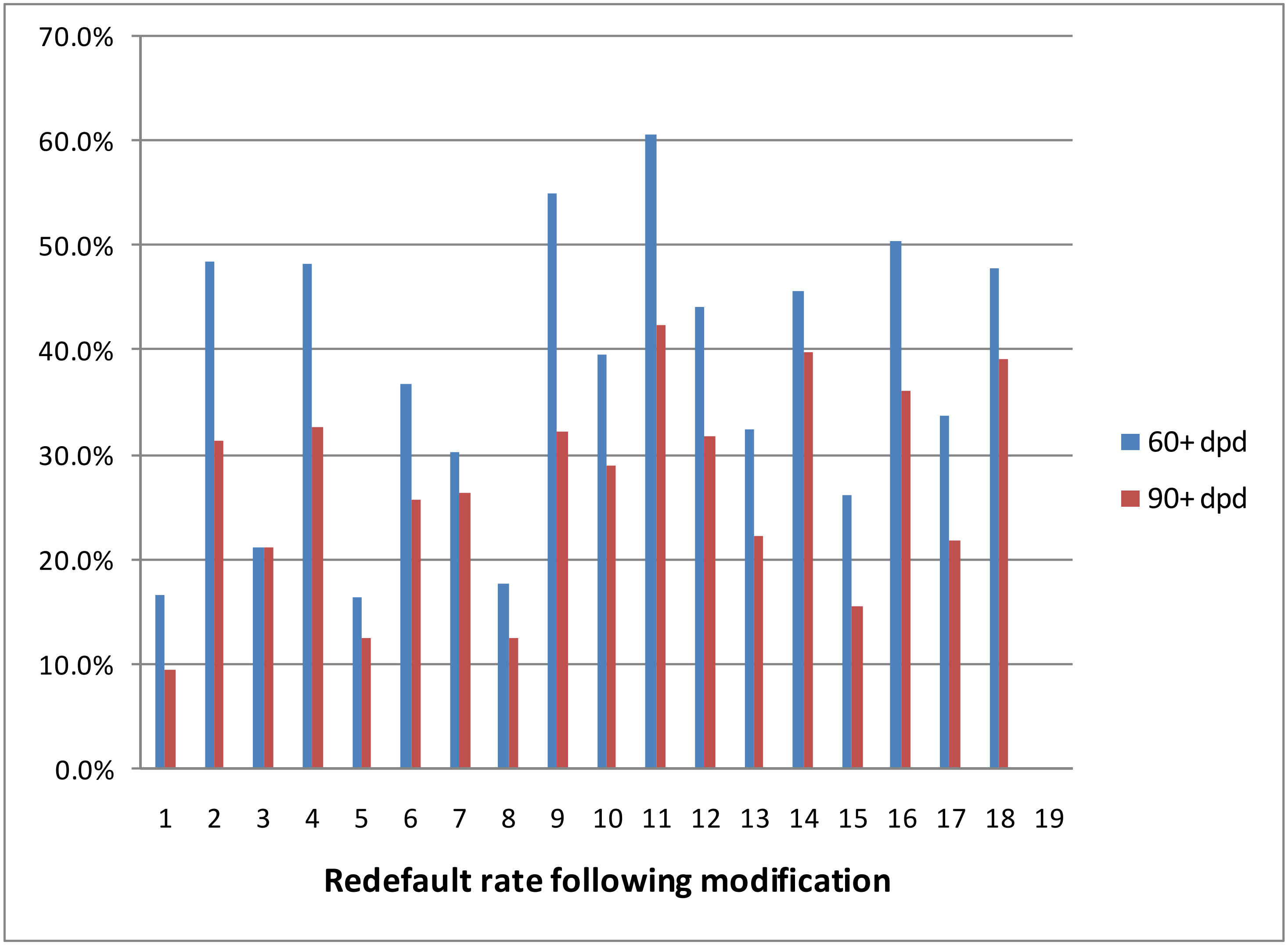
Thank you!

Backup slides

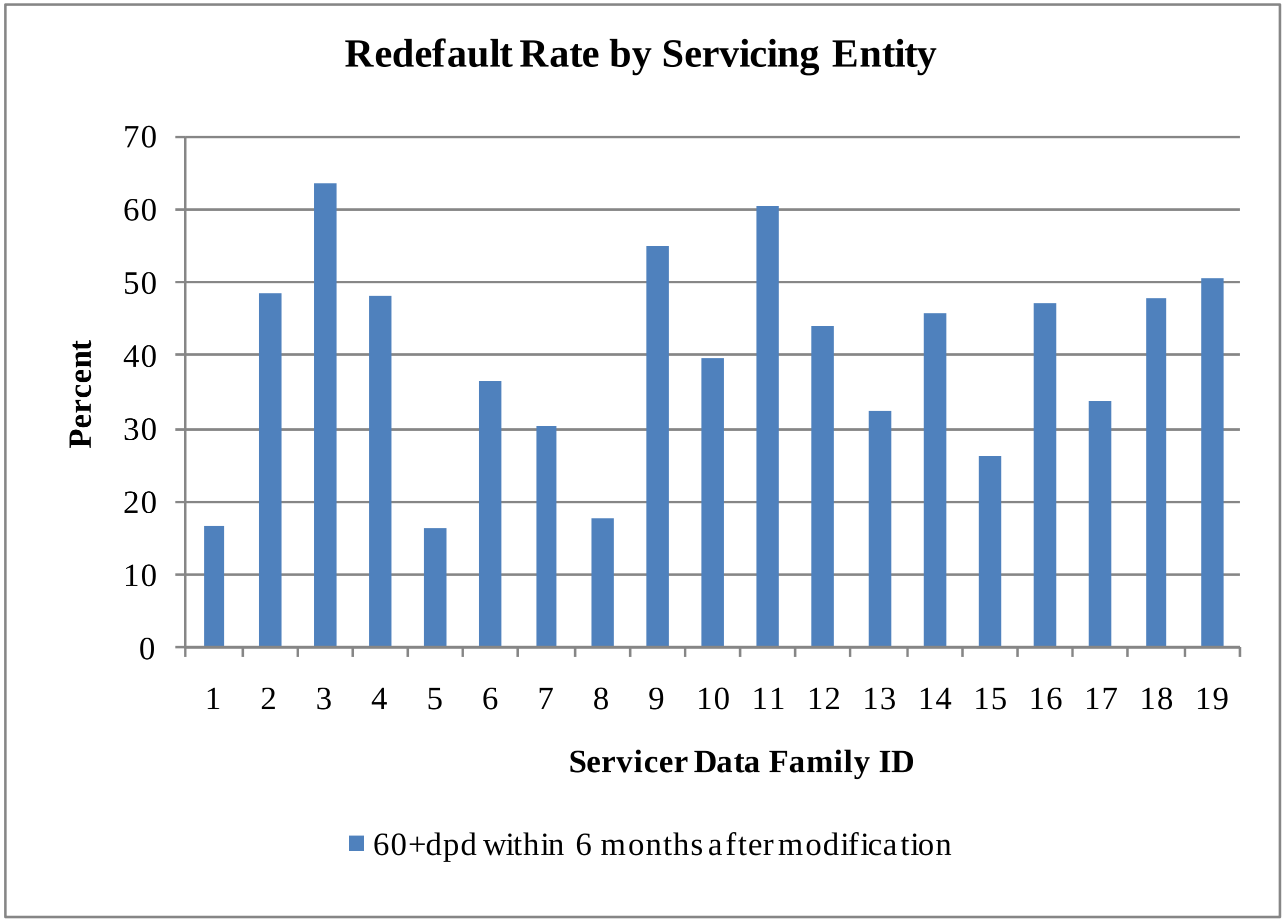
Modification type over time



Redefault rate across servicers



Redefault rate across servicers



Determinants of “No action”

	Within 6 months (0/1)
	No action
Securitizer is GSE	0.031
Securitizer is private	0.025*
Second lien	0.035
Borrower is non-occupier	-0.031**
Low doc mortgage	-0.023
Stated income mortgage	-0.030**
Mortgage is ARM	0.003
Change in unemployment (%)	-0.106***
Change in home prices since origination (%)	0.115**
log(sum(unpaid balance per lender-zip code))	-0.000
Share of servicer's modified loans in zipcode	0.002
Observations	834944
Adj. R^2	0.083
Adj. R^2 without servicer FE	0.074

Fixed effects: FICO bucket, LTV bucket, origination cohort, calendar month, servicer entity

- No action:
  - High income prospects: Full docs, low unemployment, owner-occupiers, equity in the house
  - Self Cure? Procrastination?

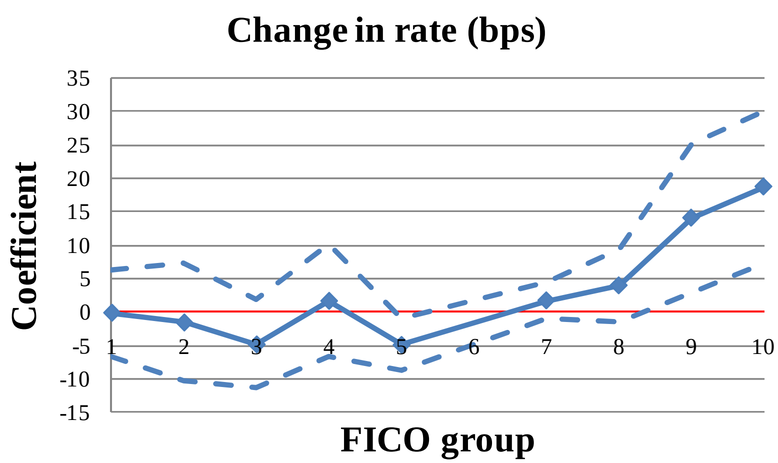
Modification terms

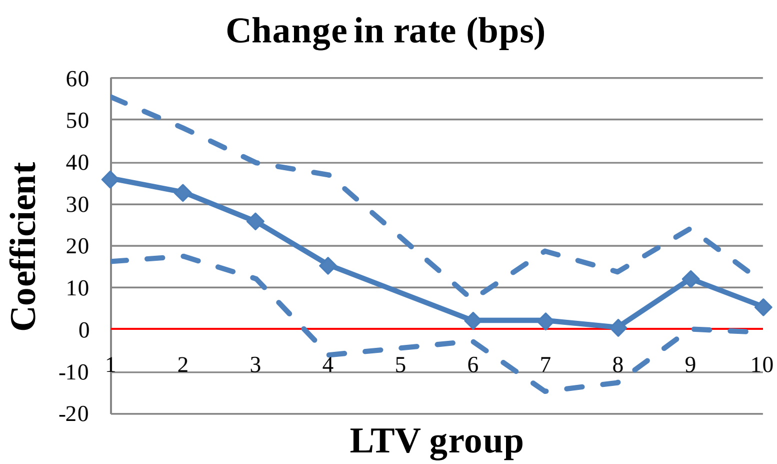
	Change in…			
	payment (%)	interest rates (bps)	balance (%)	term (months)
Securitizer is GSE	1.459	67.662**	0.665***	0.490*
Securitizer is private	-1.458***	-53.518***	0.131*	0.603**
Second lien	-4.766	-16.292	0.006	0.057
Borrower is non-occupier	1.647***	6.551	0.040	0.000
Low doc mortgage	-5.194***	-11.983	-0.028	-0.104**
Stated income mortgage	-0.945	-13.960	0.054	-0.174**
Mortgage is ARM	-3.353	6.463	-0.112	0.019
Change in unemployment (%)	-0.129	-5.707**	-0.092	-0.062
Change in home prices since origination (%)	0.261	-12.035	0.841	-1.500***
log(sum(unpaid balance per lender-zip code))	0.002	-0.046	-0.008	-0.004*
Share of servicer's modified loans in zipcode	1.198***	1.911	0.052	-0.075**
Observations	14337	62808	63166	47352
Adj. R^2	0.228	0.314	0.199	0.059
Adj. R^2 without servicer entity FE	0.150	0.222	0.138	0.026

Fixed effects: FICO bucket, LTV bucket, origination cohort, calendar month, servicer entity

- Greatest breaks:
  - Owner-occupiers
  - Low documentation

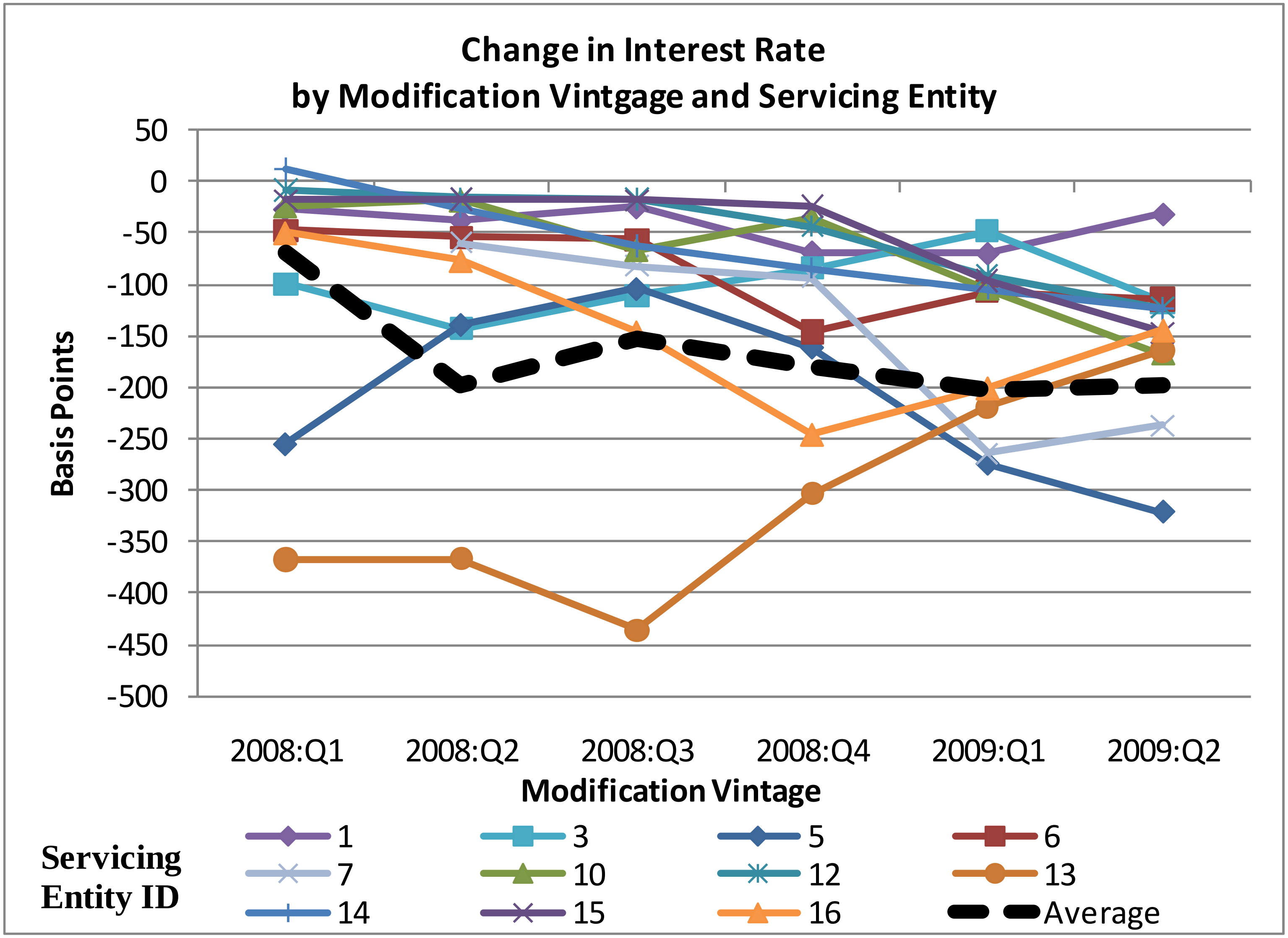
Borrower quality and Modification terms





- Weaker borrowers receive somewhat greater breaks

Δ interest rate, per vintage, servicer entity



Endogeneity of modification terms

- Regression:

  Redefault (0/1) = f(modification terms) + e

- Endogeneity:
  - Third factor (borrower unobserved quality) determines both modification terms and likelihood to redefault

- The causal effect of modification terms on redefault is underestimated if:
  - Poor quality borrowers receive better terms

Resolutions within 12 months

Quarter:	2008Q1	2008Q2
# Borrowers in trouble in cohort:	309,356	322,498
In Forclosure process	18.8%	25.8%
Liquidation	34.8%	22.0%
Total "Leave the house"	53.6%	47.7%
Repayment	3.6%	3.7%
Modification	14.7%	15.7%
Refinance	3.2%	4.4%
Total "Stay in the house"	21.6%	23.8%
No action	24.9%	28.5%

- **Half of delinquent borrowers are liquidated**
- **The rest are split between those who stay in their house and those who receive no resolution at all (self cure?)**