Online Appendix for

"The Rescue of Fannie Mae and Freddie Mac"

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Contents:

1. Balance sheets of Fannie Mae and Freddie Mac

As of Second Quarter, 2008 ($mil)

Assets	GAAP Value	
	Fannie Mae	Freddie Mac
Cash	$13,681	$43,553
Federal Funds, and Repurchase Agreements	$35,694	$15,265
Investment Securities	$344,788	$684,660
Mortgage Loans	$418,231	$89,069
Accrued Interest Receivable	$3,651	$6,247
Real Estate Owned	$5,995	$2,580
Guaranty Assets	$10,258	$11,019
Deferred Tax Assets	$20,604	$18,399
Partnership Investments	$10,113	$4,362
Other Assets	$22,903	$3,889
Total Assets	$885,918	$879,043
Liabilities		
Short-term Debt	$240,223	$326,303
Long-Term Debt	$550,279	$505,013
Subordinated Debt	$9,000	$4,496
Reserve for Guaranty Losses	$7,450	$5,345
Guaranty Obligations	$16,441	$14,022
Other Liabilities	$21,135	$10,785
Total Liabilities	$844,528	$865,964
Equity		
Preferred Stock	$21,725	$14,109
Common Stock	$642	$152
Other Paid-In Capital	$3,994	$864
Retained Earnings	$27,898	$26,128
Accumulated Other Comprehensive Loss	($5,738)	($24,180)
Treasury Stock	($7,295)	($4,125)
Total Equity	$41,226	$12,948
Memo: Off Balance Sheet Credit Guarantees (Net)	$2,289,933	$1,409,896

Notes: This table provides balance sheet information for Fannie Mae and Freddie Mac as of June 30, 2008. Balance sheet measures are presented at GAAP historical cost as reported in each firm's 10-K. Off-balance sheet credit guarantees are from each firm's "monthly summary" and net of their own MBS held on balance sheet.

2. Risk Characteristics of the Annual Flow of Conventional Single-Family Mortgage Credit Guarantees (Whole Loans and Agency MBS)

	Fannie Mae											
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total Volume ($Billions)	$804.2	$1,322.2	$588.1	$537.0	$524.4	$659.4	$583.0	$700.3	$607.8	$558.3	$836.0	$733.2
	%	%	%	%	%	%	%	%	%	%	%	%
Origination LTV												
≤ 60%	23	29	23	22	18	17	23	33	30	29	25	22
60.01 – 70%	16	18	16	16	15	13	16	17	16	16	15	14
70.01 – 80%	42	38	43	46	50	45	39	40	38	37	35	35
80.01 – 90%	11	8	8	7	7	9	12	7	9	9	9	10
90.01 – 100%	8	7	10	9	10	16	10	3	5	7	8	12
FICO Credit Score												
< 620	6	4	6	5	6	6	3	*	*	1	1	*
620 to < 660	11	10	12	11	11	12	6	2	2	4	2	2
660 to < 700	18	18	19	19	20	19	14	7	7	10	7	7
700 to < 740	23	24	24	23	23	23	22	17	16	18	16	16
≥ 740	41	44	39	42	40	40	55	74	75	67	74	75
Product												
Fixed Rate – Long Term	66	63	62	69	71	76	78	82	72	67	74	76
Fixed Rate – Inter Term	25	27	16	9	6	5	12	15	22	26	23	22
Fixed Rate – Interest Only	0	0	0	1	6	9	2	*	*	*	*	*
Adj. Rate – Interest Only	1	1	5	9	9	7	4	1	1	1	*	*
Adj. Rate – Neg. Am.	1	1	2	3	3	0	0	*	0	0	0	0
Adj. Rate - Other	7	8	15	9	5	3	4	2	5	6	3	2
Occupancy												
Primary Residence	92	93	91	89	87	89	89	93	91	89	89	87
Secondary Residence	3	3	4	5	6	5	5	5	4	5	4	4
Investment	5	4	5	6	7	6	6	2	5	6	7	9
Purpose												
Purchase	30	22	43	47	52	50	41	20	22	24	21	30
Refinance – Cash Out	32	32	29	35	34	32	31	27	20	17	14	14
Refinance – Other	38	46	28	18	14	18	28	53	58	59	65	56

	Freddie Mac											
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Total Volume ($Billions)	$533.2	$701.5	$354.8	$381.7	$351.3	$466.1	$357.6	$475.4	$386.4	$320.8	$426.9	$422.7
		%	%	%	%	%	%	%	%	%	%	%
Origination LTV												
≤ 60%		29	23	21	19	18	24	34	28	29	25	22
60.01 – 70%		19	16	16	14	14	16	18	16	16	14	14
70.01 – 80%		40	46	50	54	49	40	41	39	37	32	36
80.01 – 90%		7	8	7	7	8	11	5	14[(1)]	14[(1)]	17[(1)]	20[(1)]
90.01 – 100%		5	7	6	6	**11**	9	2	3[(2)]	4[(2)]	7[(2)]	5[(2)]
FICO Credit Score												
< 620		3	4	4	5	6	3	0	1	1	1	1
620 to < 659		8	11	10	10	11	7	2	2	2	2	3
660 to < 669		17	20	19	19	19	15	7	8	8	8	10
700 to < 739		23	24	23	24	22	22	18	18	18	17	20
≥ 740		49	41	44	42	42	53	73	71	71	72	66
Product												
Fixed Rate – Long Term												
Fixed Rate – Inter Term												
Fixed Rate – Interest Only												
Adj. Rate – Interest Only												
Adj. Rate – Neg. Am.												
Adj. Rate - Other												
Occupancy												
Primary Residence		95	92	91	89	89	89	93	93	92	91	88
Secondary Residence		3	4	5	6	5	6	5	4	4	4	4
Investment		2	4	4	5	6	5	2	3	4	5	8
Purpose												
Purchase		19	40	44	53	47	41	20	20	22	18	27
Refinance – Cash Out		26	27	35	32	32	31	26	21	18	15	16
Refinance – Other		55	33	21	15	21	28	54	59	60	67	57

Source: Annual reports for Fannie Mae, Freddie Mac, and FHFA.

[1] Reports the % of Origination LTV between 80.01 – 100%

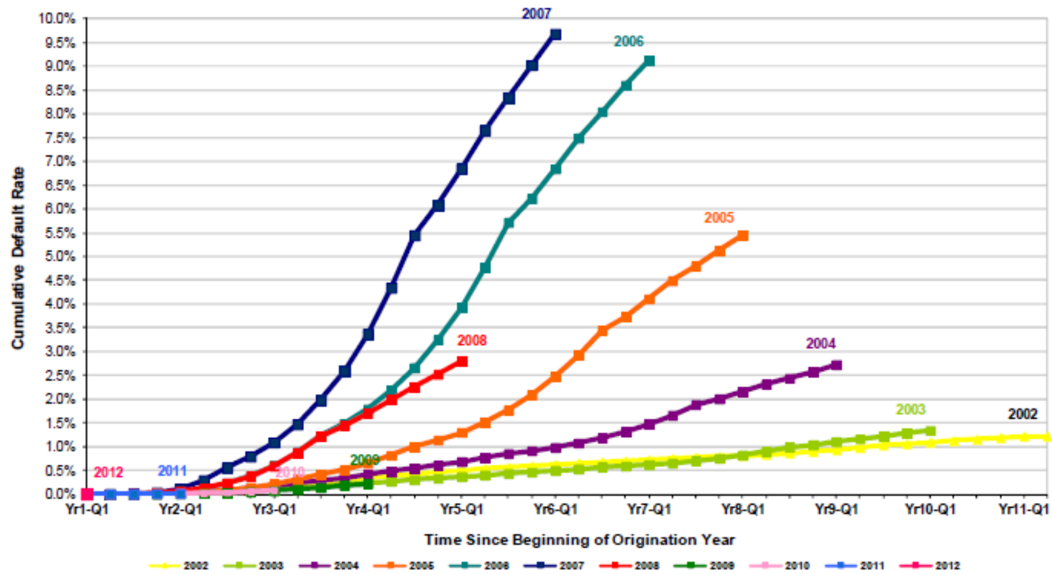
[2] Reports the % of Origination LVT above 125%

3. Cumulative Default Rates, by Origination Year

3a. Fannie Mae Cumulative Default Rates by Vintage
As of 2012:Q1 (top panel) and 2014:Q1 (bottom panel)

Fannie Mae Single-Family Cumulative Default Rates

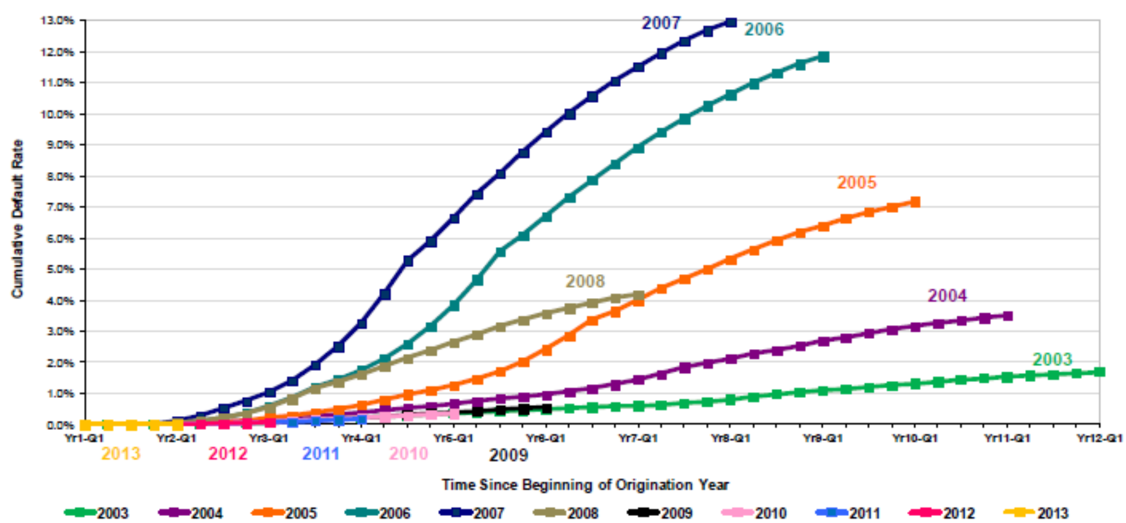
Cumulative Default Rates of Single-Family Conventional Guaranty Book of Business by Origination Y



Note: Defaults include loan liquidations other than through voluntary pay-off or repurchase by lenders and include loan foreclosures, preforeclosure sales, sales to third parties and deeds i lieu of foreclosure. Cumulative Default Rate is the total number of single-family conventional loans in the guaranty book of business originated in the identified year that have defaulted, divided by the total number of single-family conventional loans in the guaranty book of business originated in the identified year.

Data as of March 31, 2012 are not necessarily indicative of the ultimate performance of the loans and performance is likely to change, perhaps materially, in future periods.

Cumulative Default Rates of Single-Family Conventional Guaranty Book of Business by Origination Year

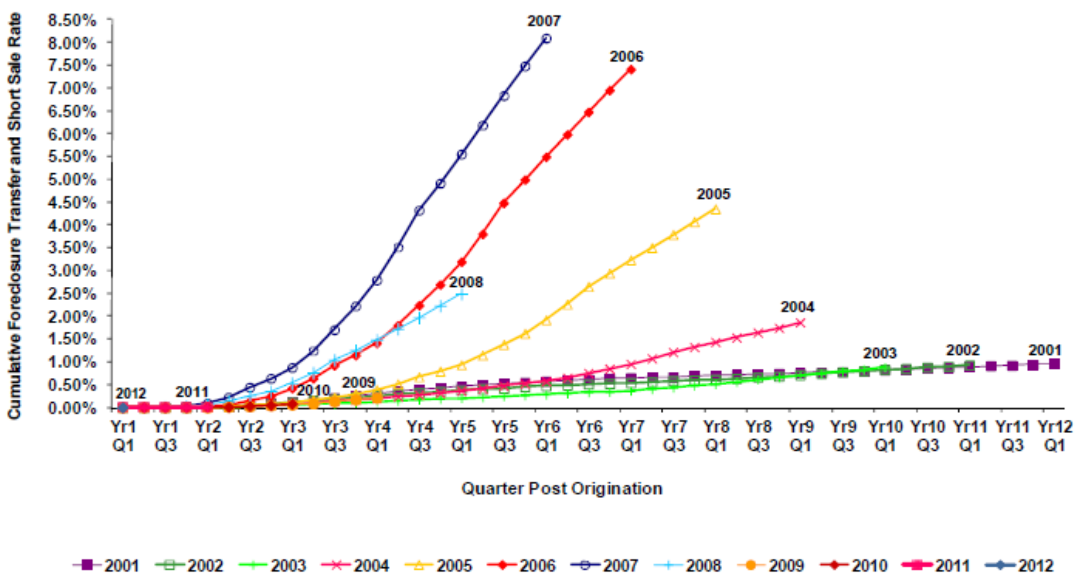


Note: Defaults consist of loan liquidations other than through voluntary pay-off or repurchase by lenders and include loan foreclosures, short sales, sales to third parties and deeds-in-lieu of foreclosure. Cumulative Default Rate is the total number of single-family conventional loans in the guaranty book of business originated in the identified year that have defaulted, divided by the total number of single-family conventional loans in the guaranty book of business originated in the identified year.

Data as of March 31, 2014 is not necessarily indicative of the ultimate performance of the loans and performance is likely to change, perhaps materially, in future periods.

3b. Freddie Mac Foreclosure Rates by Vintage
As of 2012:Q1 (top panel) and 2014:Q1 (bottom panel)

Single-family cumulative foreclosure transfer and short sale rates[1] by book year



[1] Rates are calculated for each year of origination as the number of loans that have proceeded to foreclosure transfer or short sale and resulted in a credit loss, excluding any subsequent recoveries, divided by the number of loans in the company's single-family credit guarantee portfolio. Includes Other Guarantee Transactions where loan characteristic data is available.

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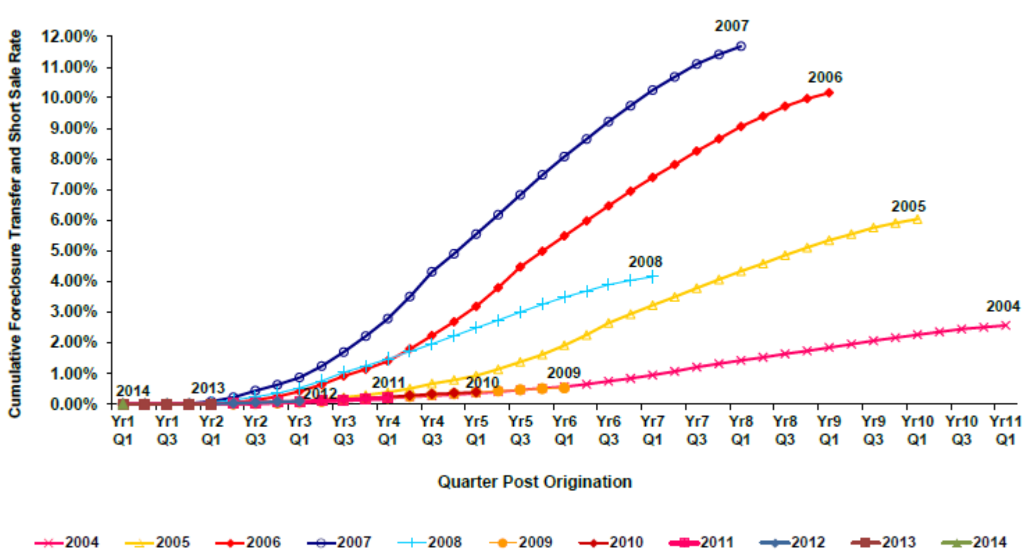
Single-family cumulative foreclosure transfer and short sale rates[1] by book year



[1] Rates are calculated for each year of origination as the number of loans that have proceeded to foreclosure transfer or short sale and resulted in a credit loss, excluding any subsequent recoveries, divided by the number of loans originated in that year that were acquired in the company's single-family credit guarantee portfolio. Includes Other Guarantee Transactions where loan characteristic data is available.

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Sources for charts shown above:

Fannie Mae:

as of 1Q2012 (see slide #15): http://www.fanniemae.com/resources/file/ir/pdf/quarterly-annual-results/2012/q12012_credit_summary.pdf

as of 1Q2014 (see slide #17): http://www.fanniemae.com/resources/file/ir/pdf/quarterly-annual-results/2014/q12014_credit_summary.pdf

Freddie Mac:

as of 1Q2012 (see slide #26): http://www.freddiemac.com/investors/er/pdf/supplement_1q12.pdf

as of 1Q2014 (see slide #31): http://www.freddiemac.com/investors/er/pdf/supplement_1q14.pdf

4. Chronology of events leading up to the conservatorships

Date	Event	Source [html link]
August 2007	Non-Agency MBS issuance comes to a halt; jumbo-conforming mortgage interest rate spread begins increasing significantly.	Vickery and Wright (2013)
Feb. 13, 2008	Economic Stimulus Act temporarily raises conforming loan limit to up to $729,750 (depending on local house price level).	Economic Stimulus Act
Feb. 27, 2008	OFHEO lifts temporary caps on size of the firms' investment portfolios.	Calculated Risk
March 16, 2008	Bear Stearns is acquired by JP Morgan Chase.	SEC Edgar Database Agreement and Plan of Merger
March 19, 2008	OFHEO reduces each firm's capital surcharge from 30 to 20 percent with a pledge by each firm to raise capital.	FHFA
July 7, 2008	Lehman Brothers report speculates that Fannie Mae and Freddie Mac will have to raise substantial capital under new accounting rules.	HousingWire
July 10, 2008	OFHEO releases statement declaring that Fannie Mae and Freddie Mac are "adequately capitalized."	OFHEO: quoted in Bloomberg
July 13, 2008	Treasury Secretary Paulson proposes three-part support plan for Fannie Mae and Freddie Mac: (1) temporary increase in the firms' line of credit with the Treasury; (2) temporary authority for Treasury to purchase equity in either firm if needed; (3) giving the Federal Reserve a consultative role in setting capital requirements and other prudential standards. The same day, the Federal Reserve announces that Fannie Mae and Freddie Mac are granted access to "discount window" lending.	Text of Paulson statement (reproduced on Bloomberg) Federal Reserve
July 30, 2008	President Bush signs the Housing and Economic Recovery Act of 2008, establishing FHFA as the regulator of Fannie Mae and Freddie Mac (succeeding OFHEO) and giving it the legal authority to place the firms into receivership.	Housing and Economic Recovery Act
Aug. 6/8, 2008	Fannie Mae and Freddie Mac announce second quarter losses of $2.3bn and $0.8bn respectively, noting adverse market developments during June and July.	SEC: Fannie Mae 10-Q SEC: Freddie Mac 10-Q
Sept. 6/7, 2008	FHFA places both firms into conservatorship. Treasury enters into senior preferred stock agreements (PSPAs) with each firm.	Statement by FHFA's Lockhart announcing conservatorship FHFA: terms of PSPAs
Sept. 15, 2008	Lehman Brothers files for Chapter 11 bankruptcy protection.	SEC: Lehman Brothers press release announcing filing
Nov. 25, 2008	Federal Reserve announces large-scale asset purchase program of $100 billion in Agency debt and $500 billion in Agency MBS.	Federal Reserve

Notes: HTML hyperlinks active at time of writing, but may no longer be functioning.

5. Estimated ownership of agency securities at time of the conservatorship

The first column of data in Table 5a presents estimated ownership of agency MBS based on data reported by Inside Mortgage Finance. The second column presents ownership shares of agency securities (including both agency MBS and agency debt, including obligations of the Federal Home Loan banks) from the Federal Reserve Flow of Funds.

5a. Ownership breakdown: agency MBS and agency debt securities

As of second quarter, 2008

Source:	Inside Mortgage Finance	Flow of funds
Set of securities considered:	Agency MBS	Agency and GSE-backed securities (debt and MBS)
Ownership shares (%)		
Government sponsored enterprises (GSEs)	18.3%	10.7%
Banks and other depository institutions	21.1%	16.9%
Securities Brokers & Dealers	2.3%	3.9%
Insurance Firms	8.4%	6.5%
REITs	0.9%	1.3%
Foreign investors	16.1%	20.9%
Pension funds and mutual funds	21.9%	19.2%
Government and other	10.9%	15.6%
ABS issuers	n/a	4.9%
Amount outstanding ($bn)	**4,799.7**	**7,888.8**

Notes: Constructed from statistics reported in Inside Mortgage Finance and the U.S. Federal Reserve Flow of Funds table L.210.

Table 5b reports a breakdown of foreign ownership of long-term government sponsored enterprise securities, broken down into agency asset backed securities (which primarily consist of agency MBS) and other securities (which primarily consist of debt issued by Fannie Mae and Freddie Mac, although it also includes debt issued by the Federal Home Loan Banks). These data are taken from the Report of Foreign Portfolio Holdings of U.S. Securities.

5b. Breakdown of foreign ownership: agency securities

Value of foreign holdings by major investing country, as of June 30, 2008

	Agency long term debt ($bn)		
Country	Asset-backed securities (ABS)	Other long-term agency debt	Total
China, mainland	369	158	527
Japan	121	149	270
Middle-East oil exporters	17	43	60
Cayman Islands	38	5	43
Luxembourg	21	8	29
Ireland	17	11	28
United Kingdom	16	10	26
Belgium	2	22	24
Netherlands	15	2	17
Switzerland	5	7	12
Canada	2	3	5
Rest of the world	150	273	423
Total	**773**	**691**	**1464**
Of which: holdings of foreign official institutions	435	532	967

Source: Table 5, Report on Foreign Portfolio Holdings of U.S. Securities produced by the Department of the Treasury, Federal Reserve Bank of New York and Board of Governors of the Federal Reserve System.

6. Calculations underlying construction of figure 1

The figure is constructed from information in the FHFA 2013 report to Congress, and the Federal Reserve Flow of Funds.

Details of figure construction:

- Generally speaking, the figure reflects the size of retained and/or securitized single family mortgages for which Fannie Mae or Freddie Mac are liable for credit risk. Thus, the figure excludes multifamily mortgages and MBS, and also excludes portfolio holdings of loans and MBS already guaranteed by another Federal agency (e.g., a government sponsored enterprise or the FHA/VA).
- To avoid double counting, agency MBS retained in portfolio by the issuing firm are not counted as part of the guarantee portfolio (they are considered as part of the retained portfolio).
- For each firm, the guarantee and retained portfolio is calculated as follows:
    - MBS guarantees are calculated as total conventional MBS owned by third parties, from table 4a and 13a of the FHFA report to Congress. The figures reported are not inclusive of multifamily mortgages, or resecuritizations of MBS issued by others. (e.g. for FNMA in 2013, the total is $2,505,614m).
    - Agency mortgage portfolio holdings are calculated as the sum of single family conventional whole loans (e.g., for FNMA in 2013, this is $237,501m) plus securities issued by the firm in question held in portfolio and backed by single family mortgages (e.g., for FNMA in 2013 this is $94,722m of FRMs + $12,710m of ARMs = $107,432m in total).
        - Note: securities held in portfolio but issued by government sponsored enterprises or by Ginnie Mae are not counted, to avoid double-counting and because the MBS is already guaranteed by another entity.
    - Private label holdings exclude holdings of nonagency MBS backed by multifamily properties. (e.g., for FNMA in 2013 total nonagency MBS held was $30,854m, of which $3,987m reflected MBS backed by multifamily loans; correspondingly, holdings of single family nonagency MBS are $26,867m).

  The graph then shows the sum of these calculations across the two firms. The market share calculation is normalized by total home mortgages as reported in the Federal Reserve Flow of Funds.
- For some categories, statistics were not reported by the FHFA for the early years of the sample. In these situations, figures were interpolated based on proportionate shares in the first year that the series became available.