JPMORGAN MBS PRIMER

MBS Strategy
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J.P.Morgan

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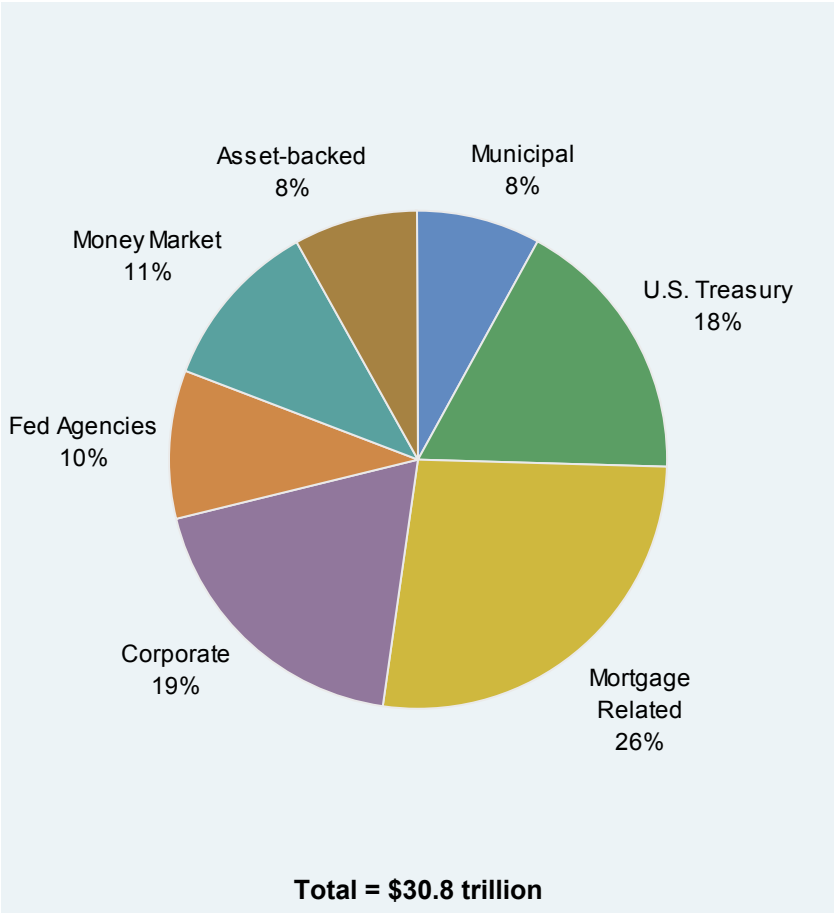
MBS in the U.S. fixed income market

Overview

- Largest US fixed income asset class
- Many products to choose from within the MBS market
  - Agency fixed-rates and ARMs
  - Non-agency fixed-rates and ARMs (Jumbos, Alt-As)
  - Whole loans
  - CMOs and other structured MBS
- Superior liquidity
  - The TBA market adds unique liquidity to MBS
- MBS market often used to express duration and curve views (due to its liquidity and size)
- Agency fixed-rate pass-throughs is 34% of the U.S. Aggregate Index (a benchmark of the U.S. investment grade debt).

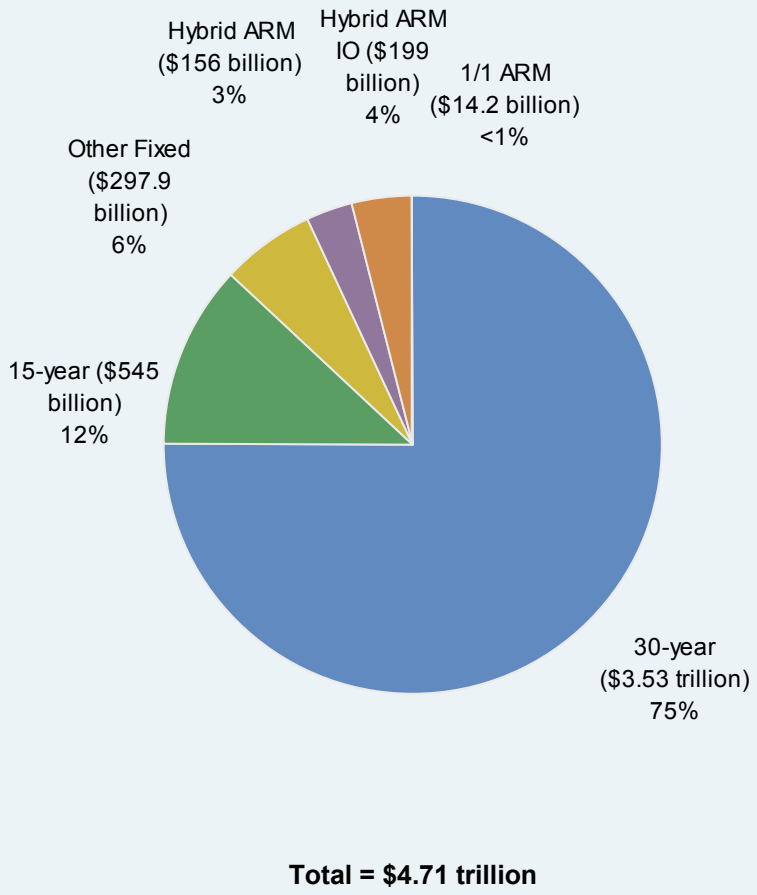
Fixed income market composition



Source: Securities Industry and Financial Markets Association (4Q 2008)

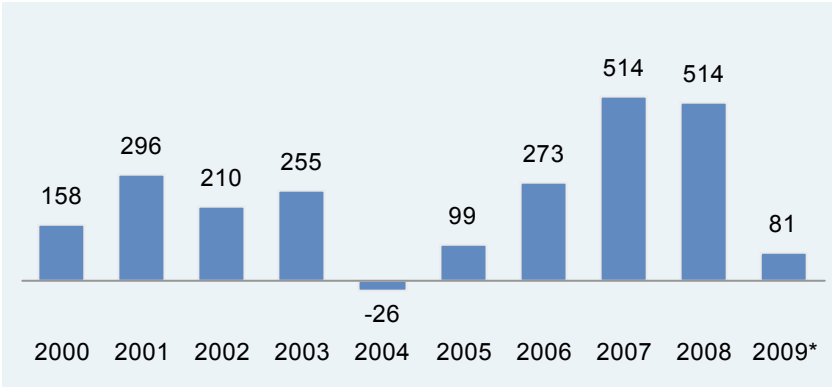
Agency MBS market composition and issuance

Securitized agency market composition



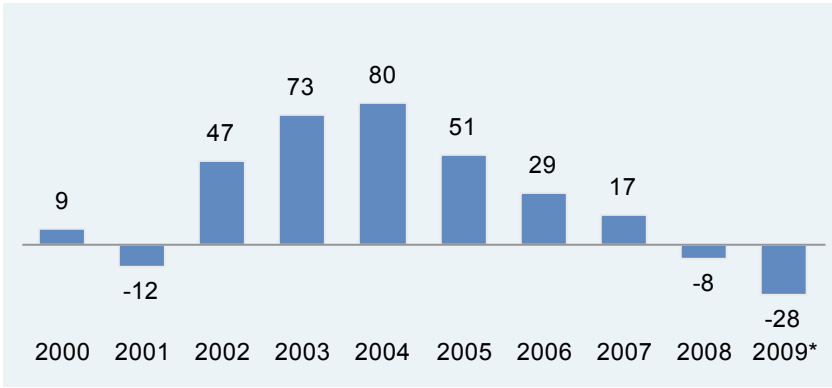
Source: JPMorgan, FNMA, FHLMC, GNMA
As of Sep 2008

Annual fixed-rate net issuance ($ billions)



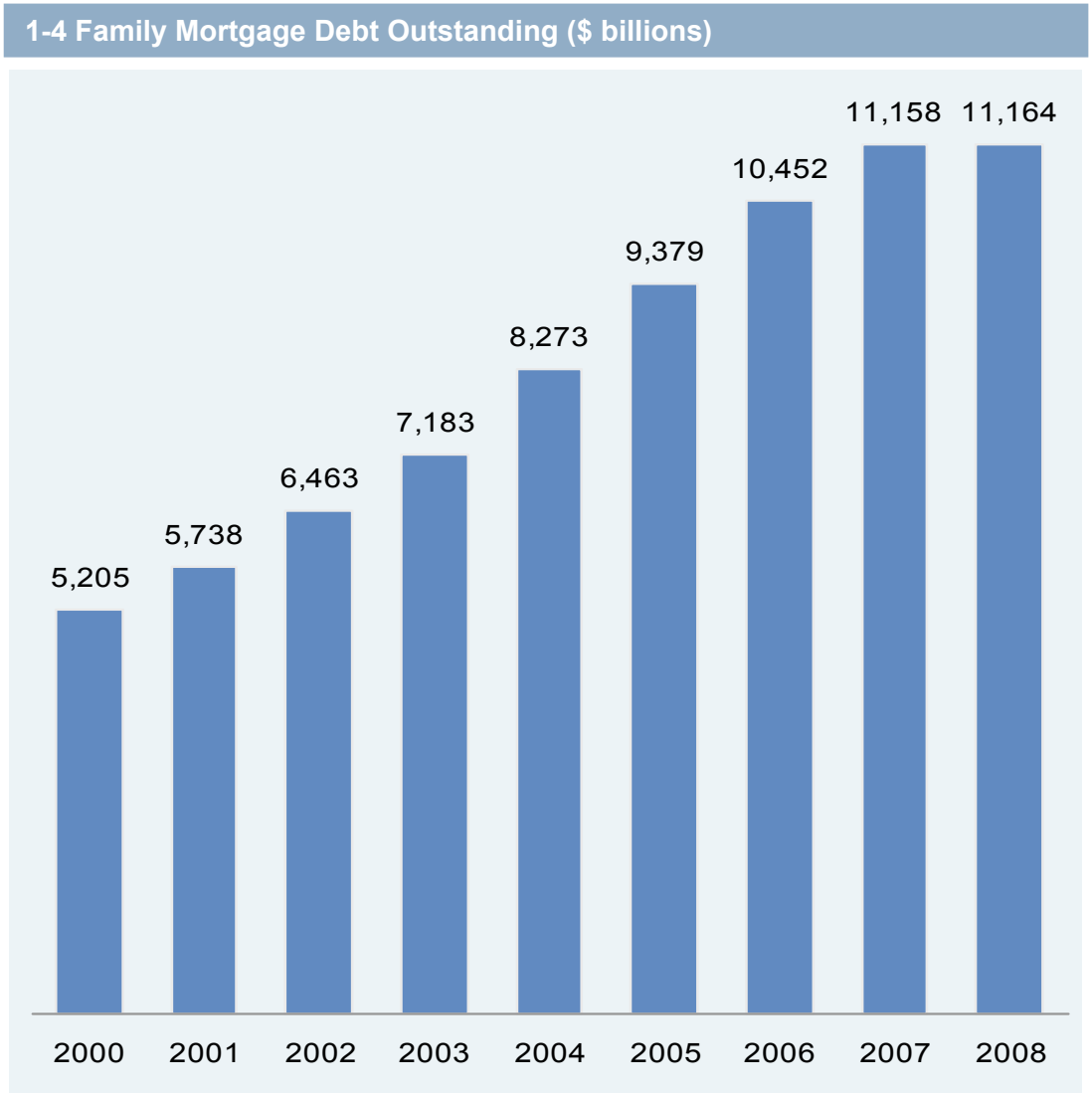
Source: JPMorgan, FNMA, FHLMC, GNMA
* As of April 2009

Annual ARM net issuance ($ billions)



Source: JPMorgan, FNMA, FHLMC, GNMA
* As of April 2009

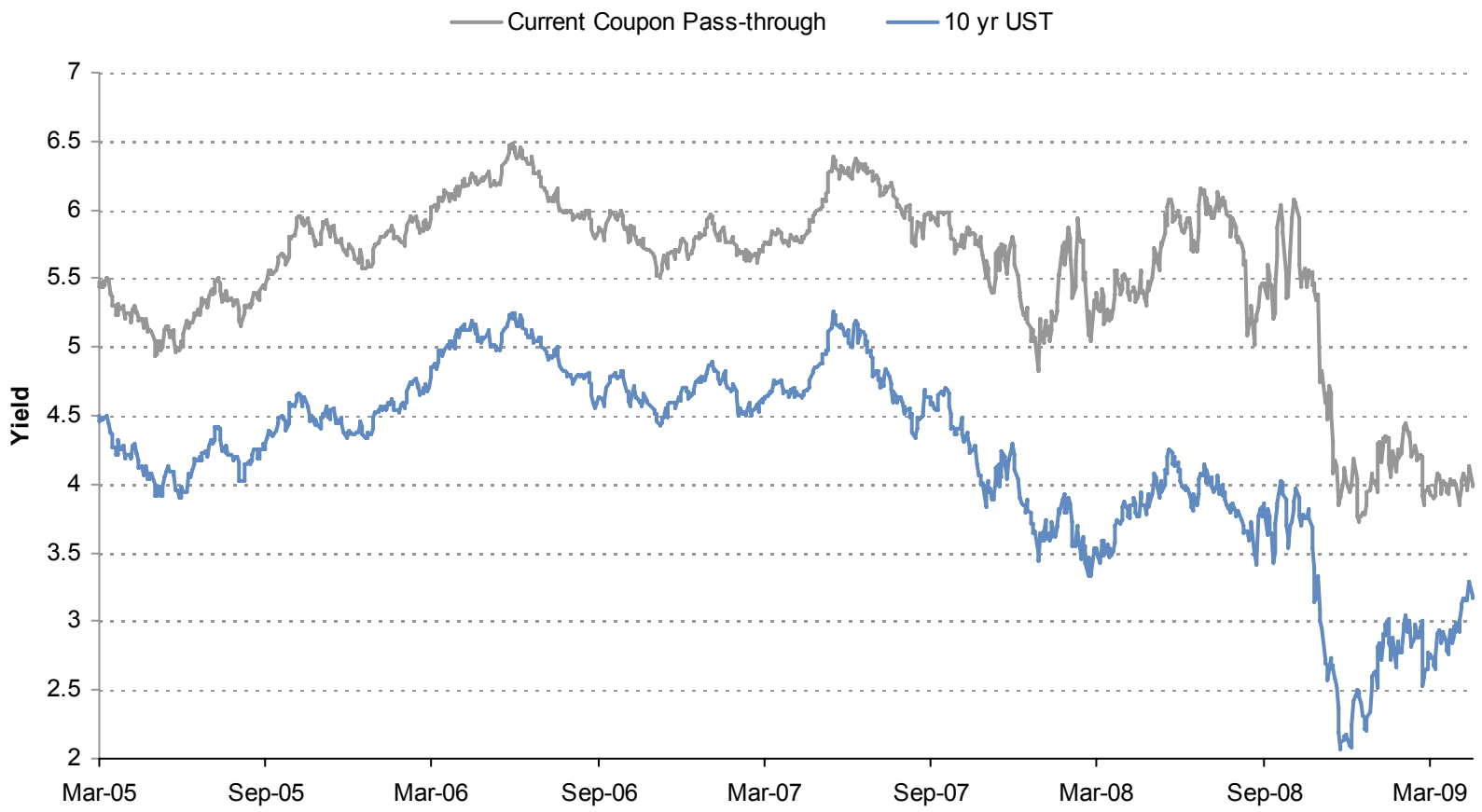
The mortgage market surged, thanks to a strong housing market and cash-out refis



Source: Federal Reserve Board
* As of 3Q2008

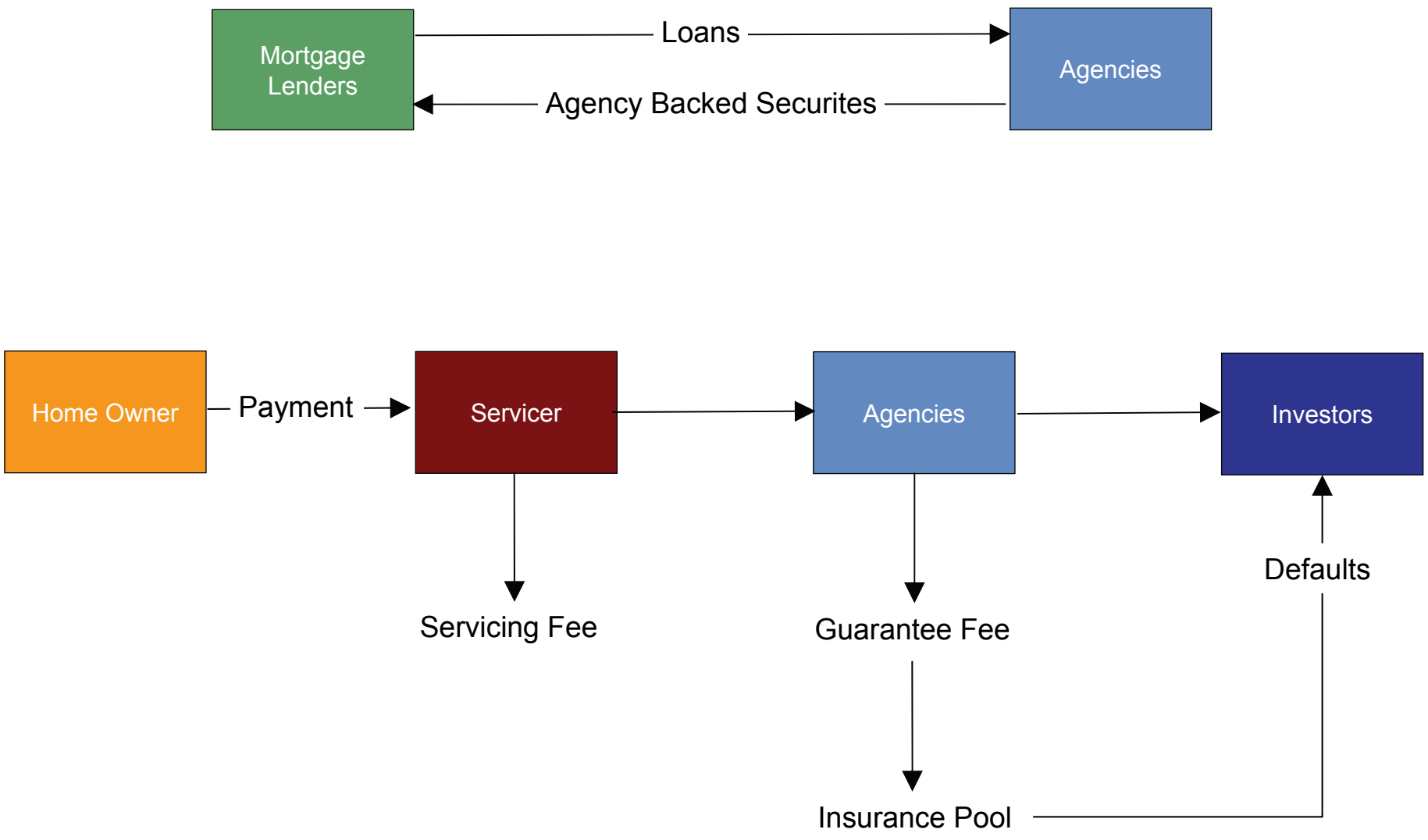
Why do investors buy mortgages? Yield pickup over Treasuries, with little credit risk in Agency space

Yield History of the FNMA 30yr CC and the 10 yr On-the-run UST

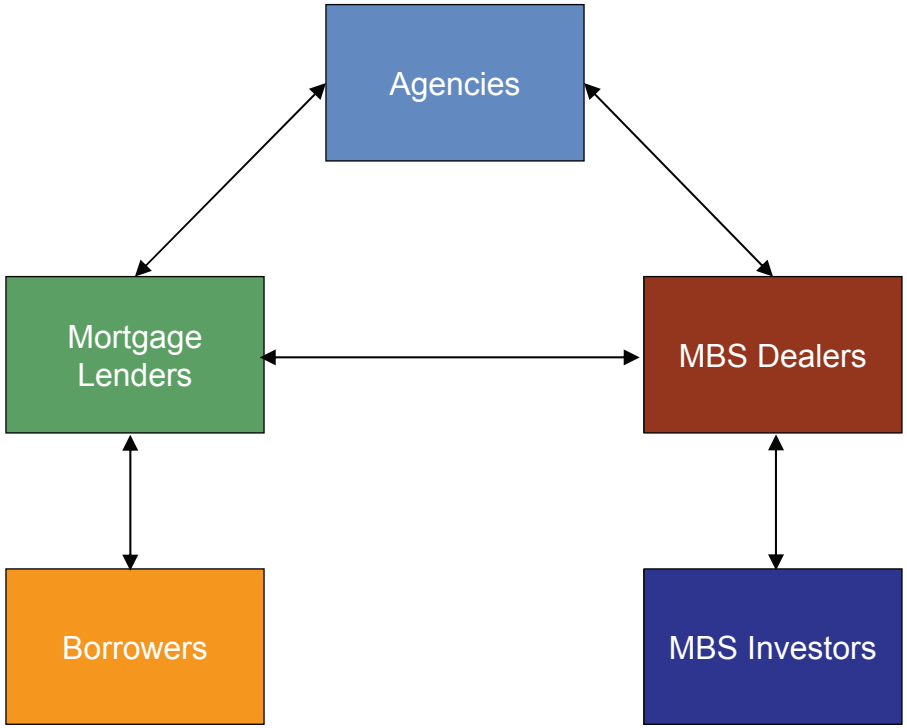


Source: JPMorgan

Securitization and the money flow of pass-throughs



The MBS market links borrowers and investors



- A “pass-through” is the basic MBS structure
- The issuer of the pass-through obtains the mortgages either by purchasing or originating the loans
- Loans with similar characteristics are pooled together and then securitized
- Investors are entitled to a pro-rata share of monthly principal and interest payments of the underlying loans, minus a servicing spread and guarantee fee

Origination: The Menu of Mortgages Has Expanded

- Origination: production of new loans in primary market
- Products
  - Fixed-rate mortgages (30-year / 20-year / 15-year)
  - Adjustable rate mortgages (Hybrid ARMs: 3/1, 5/1, 7/1, 10/1)
  - Interest-Only
  - MTAs; Option ARMs
  - Others
    - Balloon mortgages (5-year / 7-year)
    - Prepayment penalty mortgages
- "Conforming" balance loans: agency eligible loans need to meet certain collateral criteria
- "Non-conforming" loans (Private label or Non-agencies)
    - **Jumbos and Alt-As**

Understanding Mortgage Collateral : Borrower Credit & Housing Leverage

Borrower Credit and Information

- FICO Score – Historical Credit Use and Management
  - Avg FICO Score for Jumbo Mortgages : ~730
  - Avg FICO Score for Alt-A Mortgages : ~700
  - Avg FICO Score for Subprime Mortgages : ~600
  - *Non-Linear Relationship Between FICO and Propensity to Default*

- Documentation
  - Full vs. Limited/Reduced/No Doc
- Leverage (Debt to Income Ratios)
- Reserves : *Staying Power in the event of financial trouble*

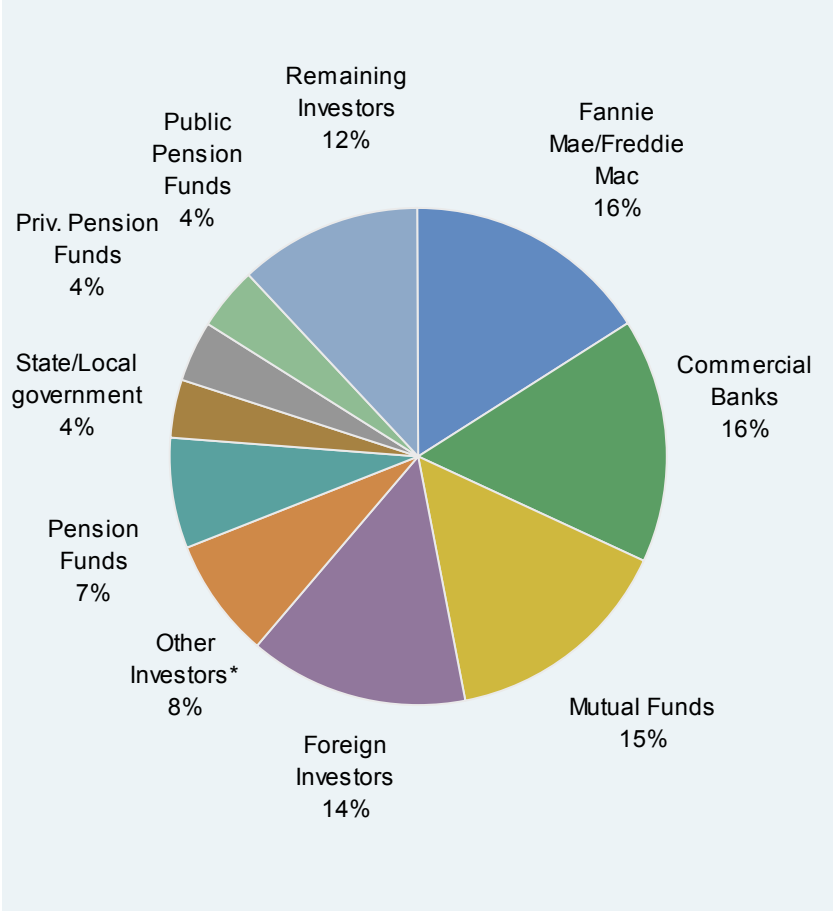
Understanding Collateral cont…

Housing Leverage

- Loan-to-Value Ratio
  - Mortgage Amount / House Value
    - *Higher LTV → Less Equity Protection for the Mortgage Investor → Higher Risk*
- Occupancy
  - Owner Occupied – Borrower Lives in the Property *(Most Secure*)
  - Second Home – Borrower has personal ties to the property
  - Investor – Business Decision on Economic Situation *(Least Secure*)
- Property Type
  - Single Family Property (*Most Secure*)
  - Condos
  - Multi-Family

Major MBS investors

MBS Investor Breakdown



Total = $6.79 trillion

Source: Inside MBS & ABS

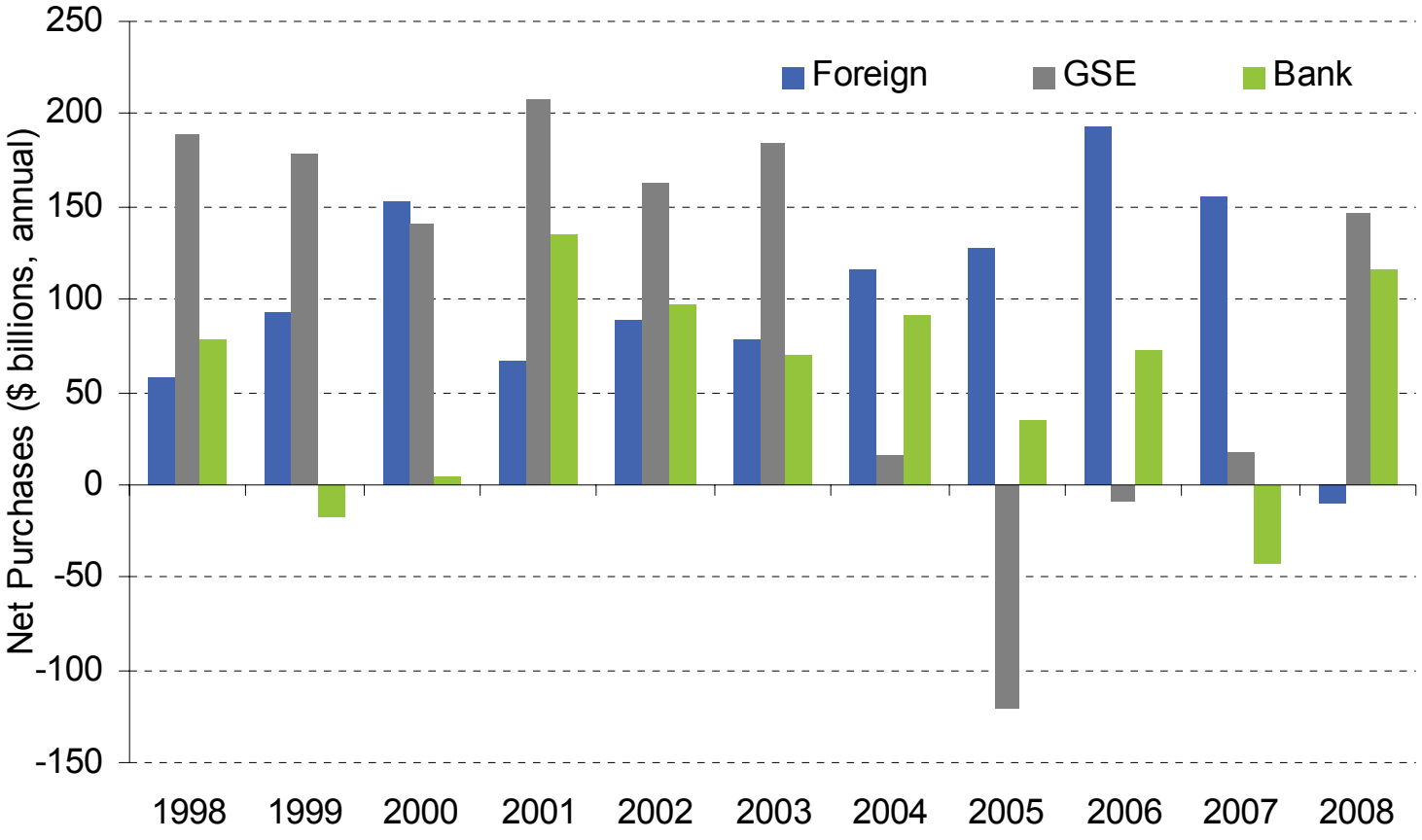
MBS Investors ($ billion)

	2007		2008			
	All MBS	Non-Agency	All MBS	Non-Agency	Change	Market Share
Fannie Mae/Freddie Mac	1,040	346	1,113	295	7%	16%
Commercial Banks	971	260	1,089	210	12%	16%
Mutual Funds	655		995	185	52%	15%
Foreign Investors	1,220	550	920	320	-25%	14%
Other Investors*	700		565	200	-19%	8%
Life Insurance Cos.	360		475	240	32%	7%
State/Local government	285		280	20	-2%	4%
Priv. Pension Funds	225		268	75	19%	4%
Public Pension Funds	235		245	52	4%	4%
Savings Institutions	265	123	212	68	-20%	3%
Securities Brokers & Dealers	260		171	26	-34%	3%
FHLBanks	127	82	160	75	26%	2%
Property/Casualty Insurers	145		145	60	0%	2%
US Treasury/NY Fed			72	-		1%
Credit Unions	63		46	3	-27%	1%
REITs	85	85	39	7	-54%	1%
Total Outstanding	**6,636**	**2,117**	**6,793**	**1,835**	**2%**	

Source: Inside MBS & ABS

Foreign demand had dominated the mortgage market during the boom

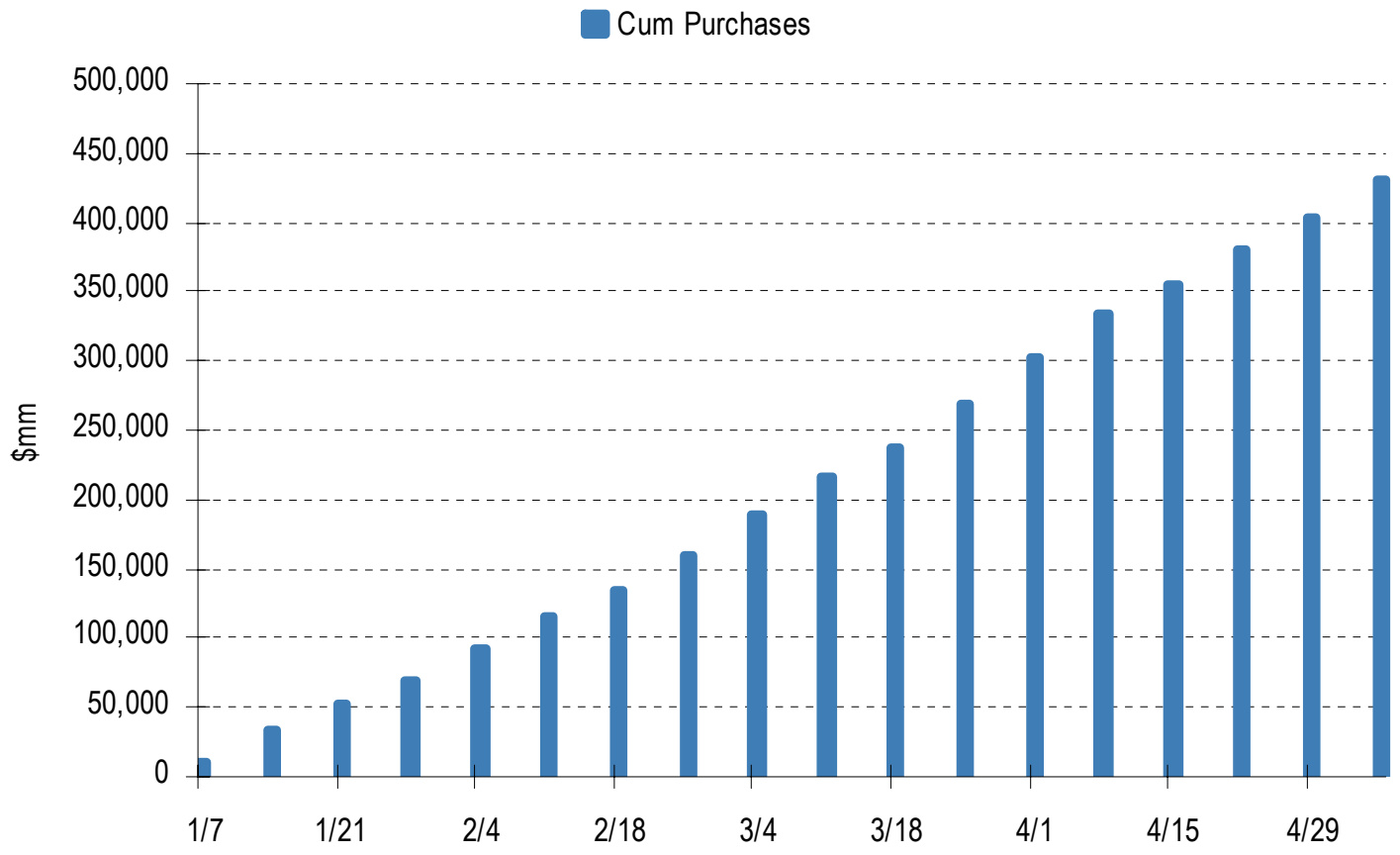
Net Purchases ($ billions, annual)



Source: US Treasury, Federal Reserve, FNMA, FHLMC, JPMorgan
* As of YE 2008.

Now, the Fed and Treasury have stepped in to support the market…

Cumulative Federal Reserve Purchases of Agency MBS



Source: JPMorgan, Federal Reserve

The GSEs

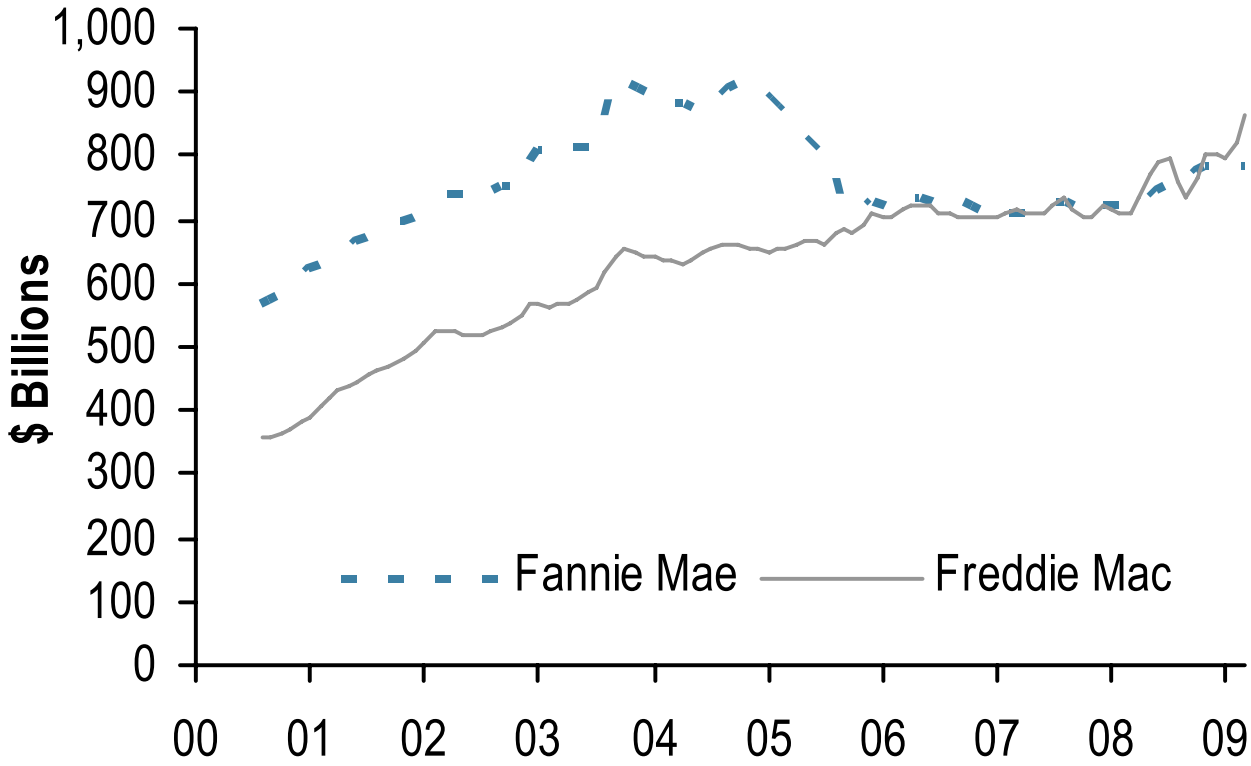
- Fannie Mae and Freddie Mac
  - Conforming loan limits are now the higher of $417,000 or 125% of median home price, with a cap of $729,750.
  - 20% risk capital weighting, regulators considering 10% weighting
- **Ginnie Mae**
  - Explicitly government guaranteed
  - Zero risk weighting
- **Federal Home Loan Banks (FHLBs)**
  - No securitization program like the other agencies
  - Represent a funding mechanism for commercial banks in the US to tap capital markets
  - Have portfolios of loans that they hold, similar to Fannie and Freddie

Unique role of Fannie and Freddie: issuer / investor

- Placed in a conservatorship with support from the US Treasury in September 2008
- Mission is to facilitate secondary mortgage market in U.S. which provides steady flow of low cost mortgage funds
- 2 major functions:
  - Guarantee loans against credit losses (charge a guarantee fee)
  - Buy loans and securities and issue agency debt
- Hold MBS, CMOs, and loans as well as ABS, CMBS, and mortgage-related spread products
- Large portfolios (FN + FH hold over $1.5 trillion in loans and MBS)

Agency Portfolio Growth, 1994-2008

Agency Retained Portfolios



Source: FNMA, FHLMC, JPMorgan

As of March 2009

Top 20 banks ranked by MBS portfolios as of year end 2008

Bank MBS and 1-4 family whole loan holdings: Top 20 banks ranked by total assets, as of 4Q08 and changes since 3Q08, $mm

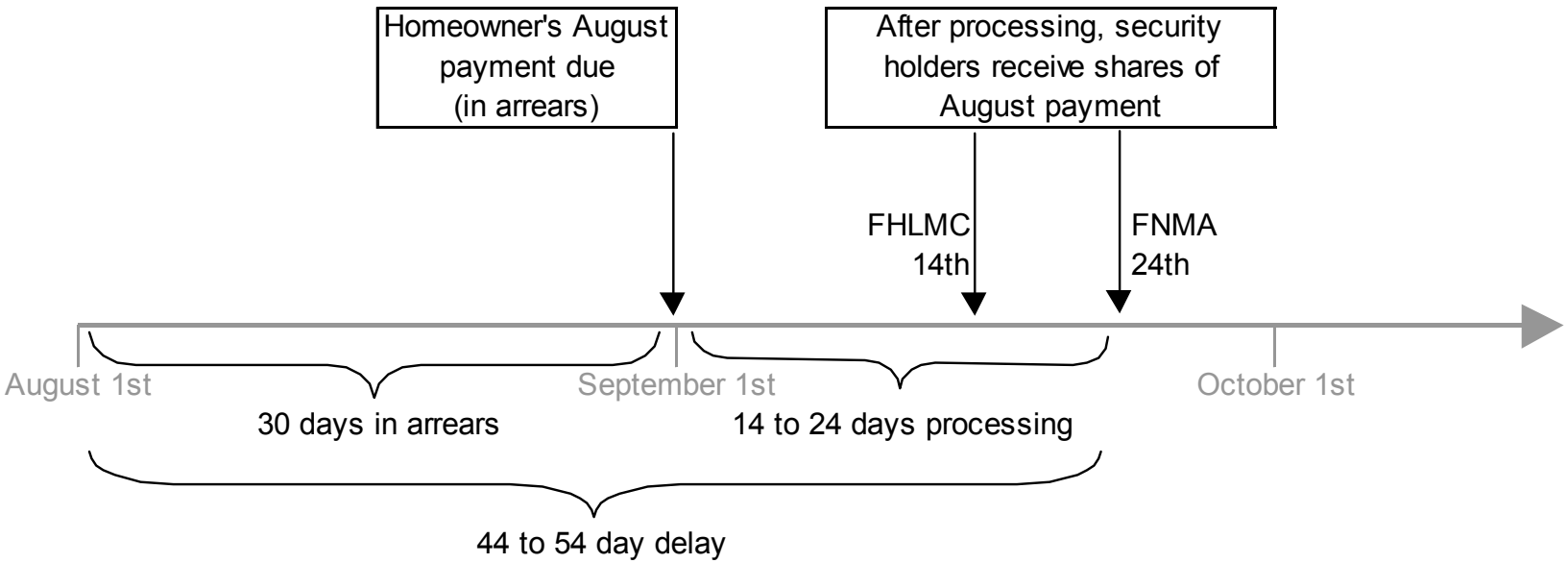
	Bank	MBS	Chg	% Chg	Pass-through	Chg	% Chg	CMO	Chg	% Chg
1	BANK OF AMERICA CORPORATION	231,771	13,894	6%	196,188	16,109	9%	35,583	(2,215)	-6%
2	JPMORGAN CHASE & CO	131,127	23,415	22%	108,192	16,250	18%	22,935	7,165	45%
3	WELLS FARGO & COMPANY	106,497	(42,824)	-29%	64,374	(37,262)	-37%	42,123	(5,562)	-12%
4	CITIGROUP INC	63,313	6,672	12%	23,199	5,431	31%	40,114	1,241	3%
5	PNC FINANCIAL SERVICES GROUP INC	42,240	4,898	13%	20,129	5,441	37%	22,111	(543)	-2%
6	BANK OF NEW YORK MELLON CORPORATION	36,869	(1,837)	-5%	5,377	355	7%	31,492	(2,192)	-7%
7	US BANCORP	31,271	(104)	0%	16,155	(464)	-3%	15,116	360	2%
8	BB&T CORPORATION	28,690	12,207	74%	20,292	12,240	152%	8,398	(33)	0%
9	CITIZENS FINANCIAL GROUP INC	26,868	(872)	-3%	10,359	(510)	-5%	16,509	(363)	-2%
10	CAPITAL ONE FINANCIAL CORPORATION	25,765	3,660	17%	14,016	1,930	16%	11,749	1,730	17%
11	STATE STREET CORPORATION	23,401	(1,214)	-5%	7,133	(232)	-3%	16,268	(982)	-6%
12	SUNTRUST BANKS INC	15,022	5,192	53%	13,998	5,212	59%	1,024	(19)	-2%
13	REGIONS FINANCIAL CORPORATION	14,606	1,526	12%	9,331	1,692	22%	5,274	(166)	-3%
14	TD BANKNORTH INC	13,456	888	7%	3,107	1,083	54%	10,349	(195)	-2%
15	FIFTH THIRD BANCORP	8,621	(1,247)	-13%	4,956	(1,493)	-23%	3,664	246	7%
16	BBVA USA BANCSHARES INC	7,974	(131)	-2%	4,590	144	3%	3,383	(274)	-7%
17	KEYCORP	7,885	5	0%	1,504	(7)	0%	6,380	12	0%
18	COMERICA INCORPORATED	7,624	(299)	-4%	6,146	(215)	-3%	1,479	(84)	-5%
19	M&T BANK CORPORATION	7,090	(291)	-4%	2,998	(97)	-3%	4,093	(194)	-5%
20	BOK FINANCIAL CORPORATION	6,481	395	6%	1,779	(394)	-18%	4,702	789	20%
	Top 20	836,572	23,933	3%	533,824	25,213	5%	302,747	(1,280)	0%
	Next 30	68,404	3,567	6%	35,305	2,909	9%	33,099	657	2%

Source: JPMorgan, Federal Reserve

MBS Terminology

- **Pools** are comprised of mortgage loans with similar rates and terms
- **WAC** – weighted average coupon of all loans in pool (vs **Coupon**)
- **WAM** – weighted average maturity of loans in pool
- **WALA** – weighted average loan age
- **Original face** – original principal amount of pool
- **Current face** – remaining principal balance of pool
- **Origination year** – average origination year of loans in pool; **age (WALA)** is important in prepayment assessment (“seasoning”)
- **CPR – Constant Prepayment Rate** – annualized percentage of remaining principal prepaid

Mortgage cash-flow characteristics



Mortgage cash-flow

- **Example: $500,000 purchase price; $400,000 loan amount; 6% mortgage rate; 30-year fixed-rate loan**
- **Using "MP" function on BBG…**

MORTGAGE PAYMENT SCREEN Page 1 of 25

PAYMENT OPTIONS

Enter 2 of the below 3 variables

LOAN AMOUNT	INTEREST RATE	PAYMENT
400000.00	6.000	2398.20

PAYMENT FREQ M

LOAN PERIOD

YEARS	MONTHS	or START	END
30	0	8/18/05	8/18/35

POINTS/OTHER

POINTS 0.00 PROCEEDS 400000.00

EFFECTIVE RATE 6.000

PREPAYMENT OPTIONS

Complete below for scheduled prepayments

I wish to prepay the additional amount of 0.00 every M beginning with the payment on 9/18/05.

Enter up to 8 single prepayments below

DATE	AMOUNT	DATE	AMOUNT
/ /		/ /	
/ /		/ /	
/ /		/ /	
/ /		/ /	

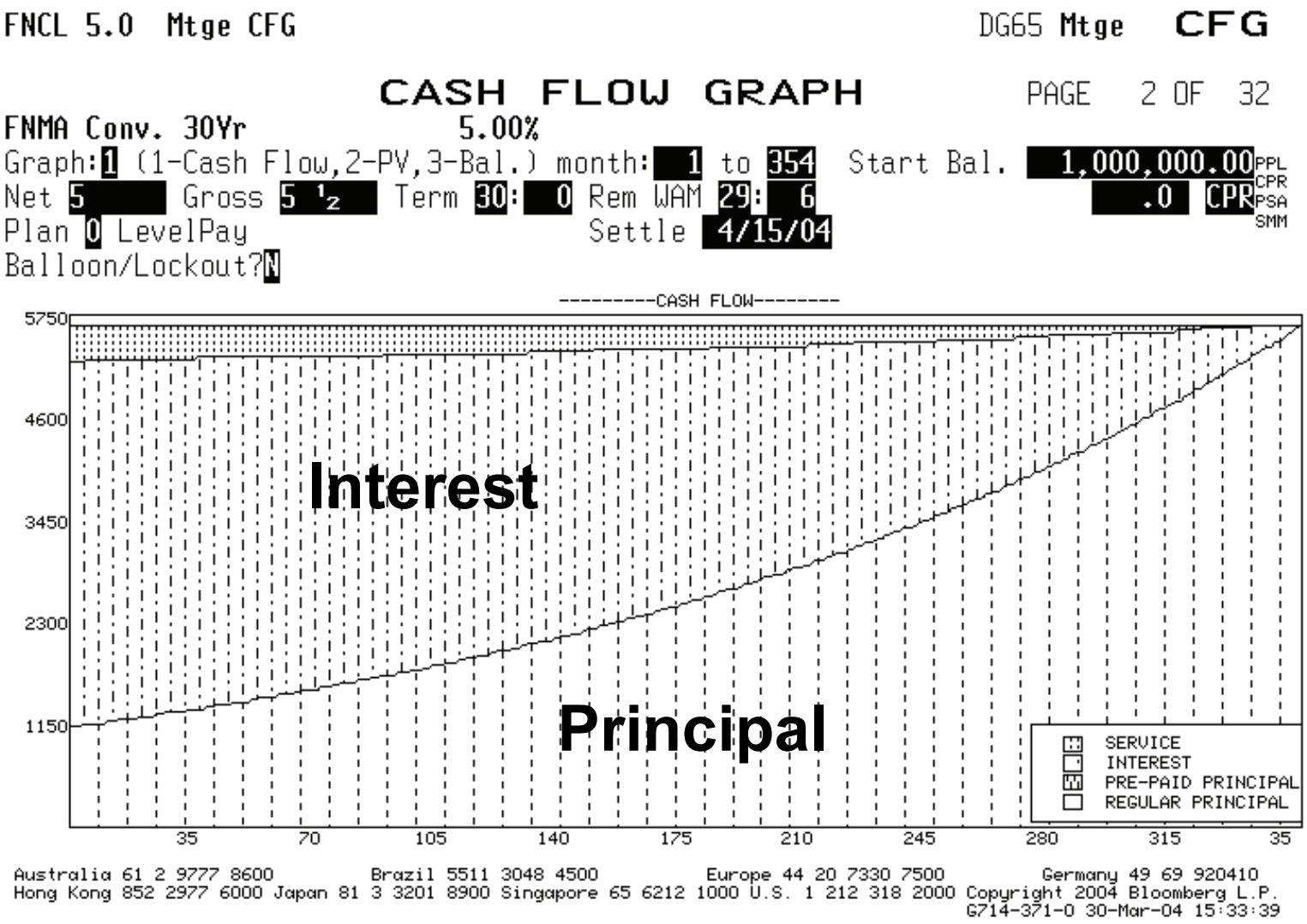
To reduce interest expense and/or shorten the loan term, evaluate using prepayment options.

AMORTIZATION SCHEDULE

PAYMENT PERIOD SPECIFIC				CUMULATIVE		OUTSTANDING AMOUNTS	
Date	Payment	Interest	Principal	Interest	Principal	Interest	Principal
9/18/05	2398.20	2000.00	398.20	2000.0	398.2	461352.8	399601.8
10/18/05	2398.20	1998.01	400.19	3998.0	798.4	459354.8	399201.6
11/18/05	2398.20	1996.01	402.19	5994.0	1200.6	457358.8	398799.4
12/18/05	2398.20	1994.00	404.21	7988.0	1604.8	455364.8	398395.2
1/18/06	2398.20	1991.98	406.23	9980.0	2011.0	453372.8	397989.0
2/18/06	2398.20	1989.94	408.26	11969.9	2419.3	451382.8	397580.7

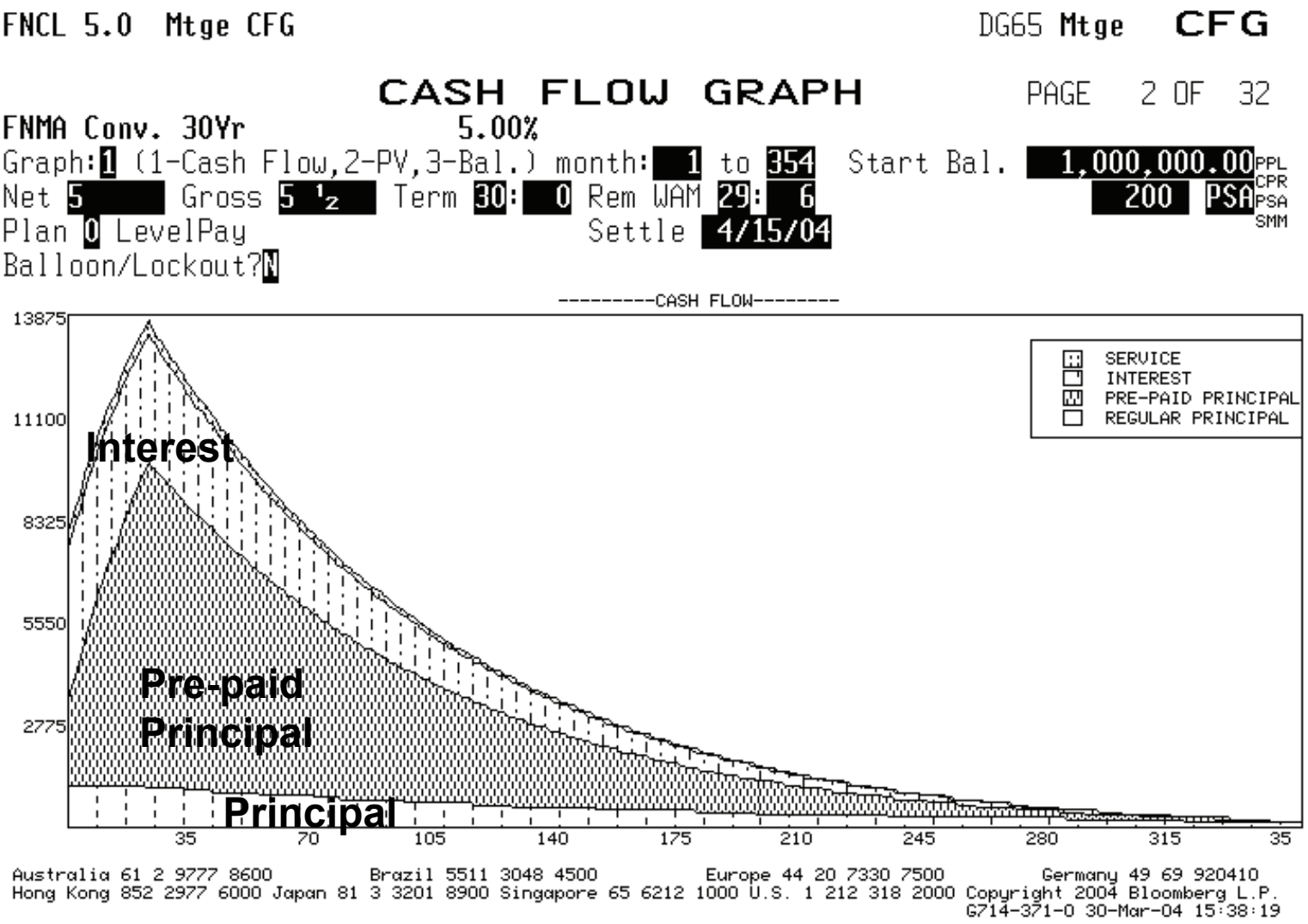
Source: Bloomberg

Mortgage cash-flows: without prepayments



Source: Bloomberg

Mortgage cash-flows: with prepayments



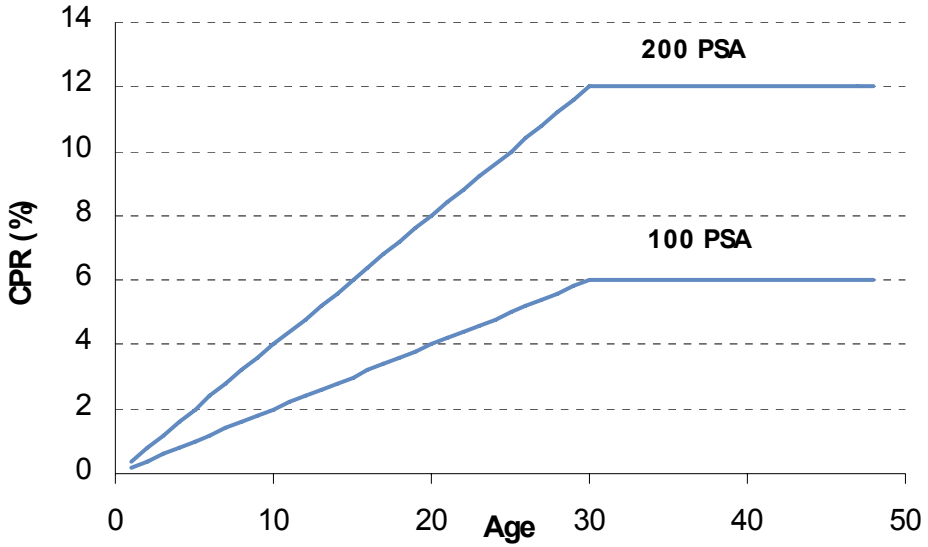
Source: Bloomberg

Prepayments: source of MBS optionality

- Borrowers have the right to prepay at any time without penalty – in effect “calling” their loans away from investors; prepayments may be partial or complete
- Valuing this call option and the cash flow uncertainty it creates is the key to understanding MBS
- Timing and rate of prepayments vary and produce non-level, less-predictable cash flows

Prepayment standards

- CPR – Constant Prepayment Rate – annualized percentage of remaining principal prepaid
- PSA – prepayment vector expressed as a series of CPRs; begins at .2% in the first month, increases .2% per month, leveling out at 6.0% in month 30; prepayment assumptions for pricing stated as linear multiples of PSA schedule



Many Different Types of Spreads

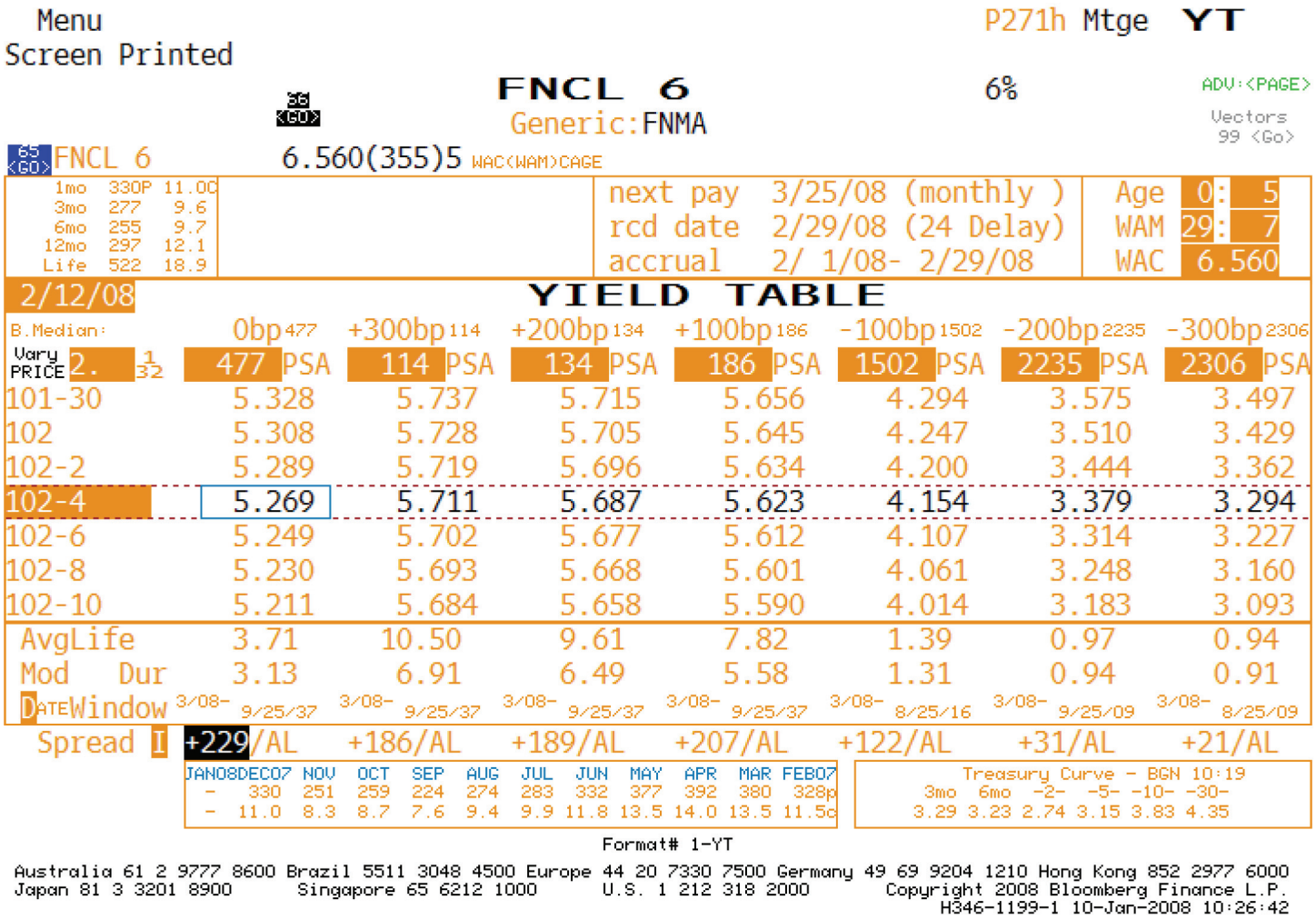
- Basic: static yield spread over a single point on the curve
  - "I" : spread to Treasury
  - "N" : spread to swaps
- Intermediate: zero volatility yield curve spread
  - "Z" : spread to Treasury curve
  - "E" : spread to Libor/swap curve
    Libor ZSpread on JPMorgan's analytic reports.
- Advanced
  - OAS : option-adjusted spread
    - LIBOR OAS
    - Treasury OAS

Yield analysis in the MBS market

- Static Spread (Yield Spread): standard measure of incremental return over a single benchmark Treasury
  - ➔ Compares MBS to single point on the yield curve, usually to the interpolated point closest to the Weighted Average Life of the MBS
  - ➔ But MBS does not return principal in one lump sum but over many periods. A better assumption would include multiple data points on the yield curve. Z Spread takes this another step further.

- ZV Spread (Yield Curve Spread) : discounts each monthly MBS cashflow by the monthly forward rates derived from the current yield curve
  - ➔ More accurate for securities that return principal over many periods as opposed to bullets
  - ➔ Still a static measure since it assumes that interest rates and MBS cashflows remain constant

Evaluating pass-throughs: yield / average life



Source: Bloomberg

Prepayments and OAS

- Prepayment issues:
  - ➔ Reinvestment risk:
    1. When rates decline and speeds increase the investor has to reinvest an increased amount of principal at lower rates
    2. When rates increase and speeds decline, the investor has less cashflow to reinvest at higher rates
  - ➔ Discount bonds: when rates decline, the benefit of earlier return of principal at par may mitigate reinvestment risk
  - ➔ Premium bonds: when rates increase, the benefit of a larger outstanding principal balance and longer average life means higher and more interest payments which may mitigate the reinvestment risk
- OAS has been derived to account for the dispersion and uncertainty associated with this return of principal from MBS

OAS Calculation

- To incorporate prepayment volatility in the valuation of MBS, we can calculate a theoretical price for a given OAS
  1. Hundreds of hypothetical interest rate paths are simulated
  2. On each interest rate path the prepayment model is used to predict prepayment speeds and thus, MBS cashflows
  3. For each path, the present value of the projected cashflows are calculated using a specified spread, s, which is added to the forward rates
  4. Value of MBS = Average value of PV(s) over all simulated interest rate paths
     = AVGPV(s) where s is OAS
- To find OAS given market price:
  1. Start with an initial estimate for OAS
  2. Calculate AGVPV(s) and keep adjusting until AVGPV(s) = market price
- Drawback of OAS:
  1. The spread earned by the investor depends on the actual path realized and can be drastically different from the OAS
  2. Wide differences in OASs are produced by different firms models due to different term structures, volatility assumptions and prepayment projections
  3. Doesn't account for dollar roll financing
  4. Is a "black box" – difficult for investors to decompose OAS into its component parts.

Pass-through risk measurement (duration)

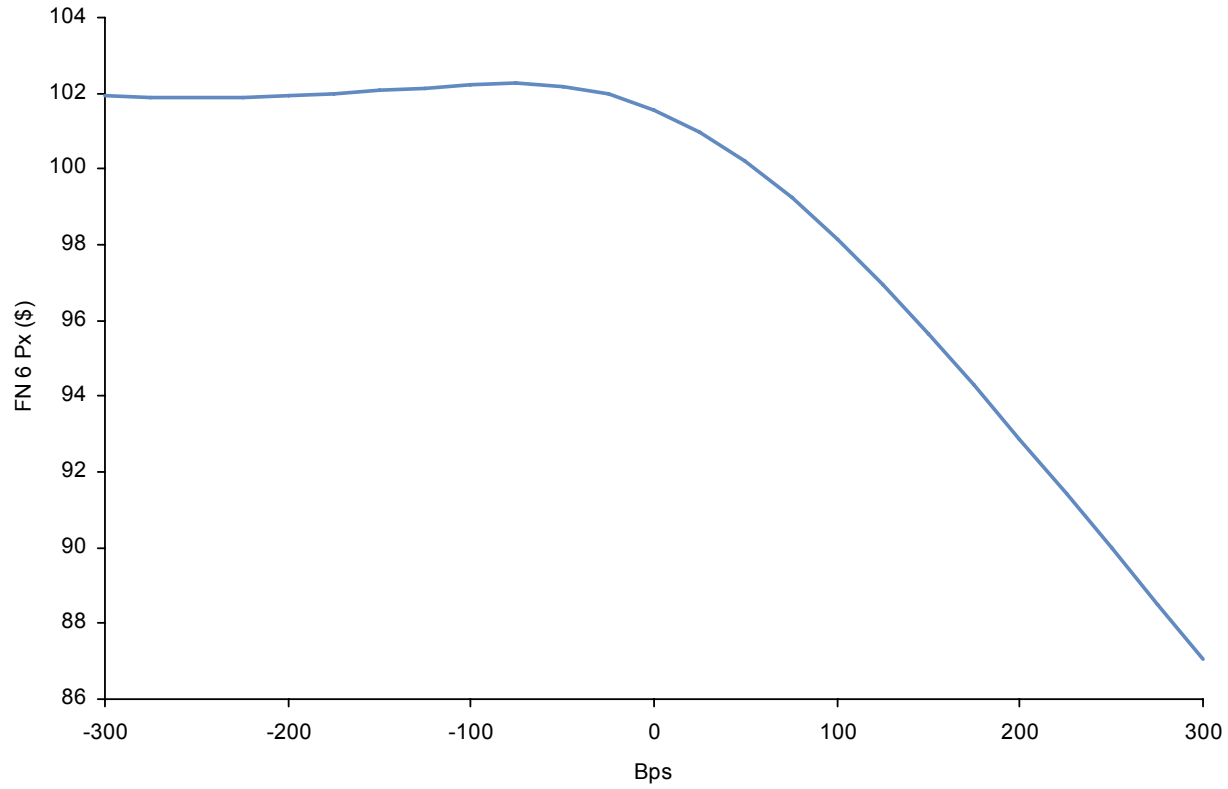
- **Various measures of duration:** % change in price for a 1% change in rates.
- **Modified duration** is inappropriate for pass-throughs as it cannot accommodate varying cash flows.
- **OAD** is found by calculating constant OAS prices for parallel curve shifts.
- **Empirical duration** uses actual observations regressed against a Treasury benchmark. Directional/empiricals could be different against different parts of the yield curve.
- Duration is typically expressed as a % of the 10-year Treasury duration:
  - *For instance, a par-priced mortgage with a duration of 3 years, compared to a 10-yr Tsy duration of 7.5 yrs: 3/7.5 = 40% of a 10-yr*
- None of these measures is perfect. We tend to use a combination of them all.

Pass-through risk measurement (convexity)

- **Convexity:** the rate at which the duration of a security changes as interest rates change.
  - Positive convexity implies that for small, equal and opposite changes in interest rates, the increase in price if rates go down will be more than the decrease in price if rates rise.
  - Negative convexity implies that the increase in price if rates go down will be smaller than the decrease in price if rates rise.
  - Bullet Treasuries have positive convexity. Pass-throughs typically have negative convexity.

Negative convexity of mortgages

FN 6 prices ($) vs shift in rates (bps), as of July 2007



Source: JPMorgan

A real-world example: Hedging a position of FNMA 6s

Buy $100m FNMA 30 6.0

Hedging Possibilities

- Hedge duration with $54m 10Y Treasuries (OAD=4.12 Treas Dur=7.64). This provides protection against parallel yield curve shifts.

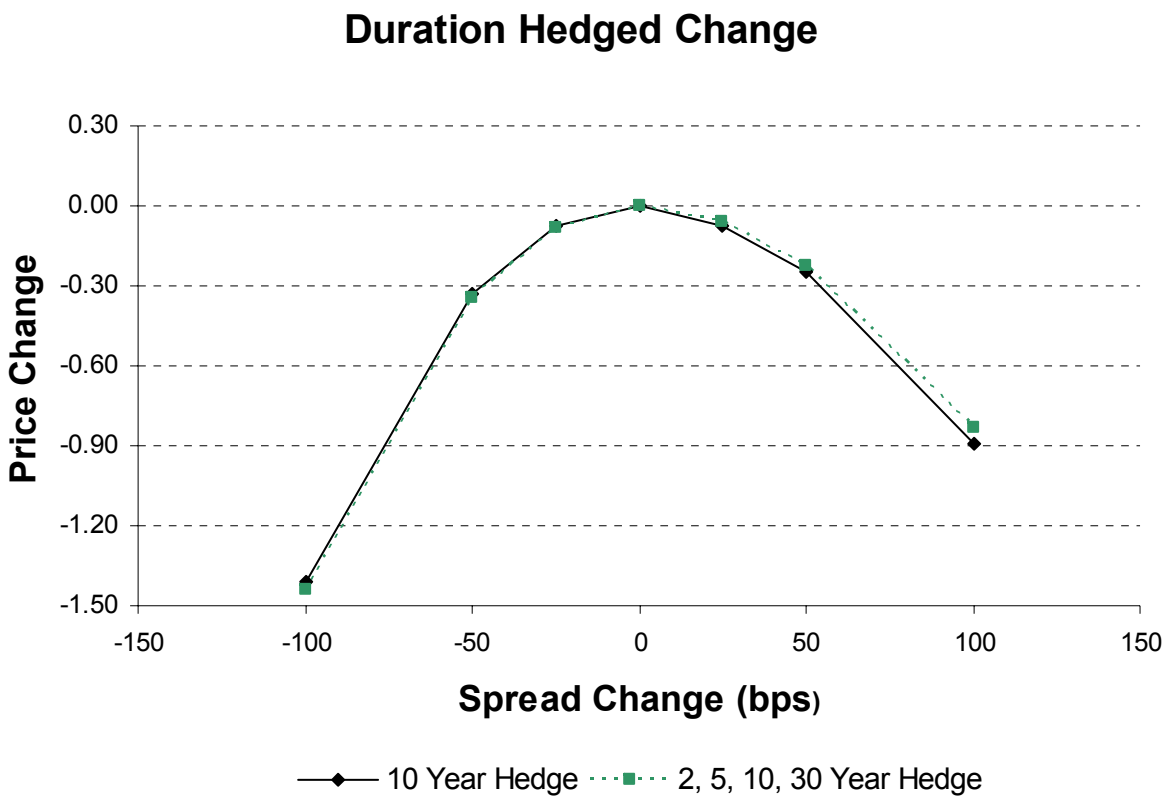
- Hedge duration with 2Y, 5Y, 10Y, and 30Y Treasuries. This protects against any yield curve movements.

- Convexity hedge with $19m ATM 3Mx10Y swaption straddle.

	Pass-through Partial	Treasury Duration	Hedge Ratio
2Y	0.74	1.89	0.39
5Y	1.17	4.37	0.27
10Y	1.67	7.64	0.22
30Y	0.59	14.09	0.04
Total	4.17		

Scenario Analysis with Duration Hedging

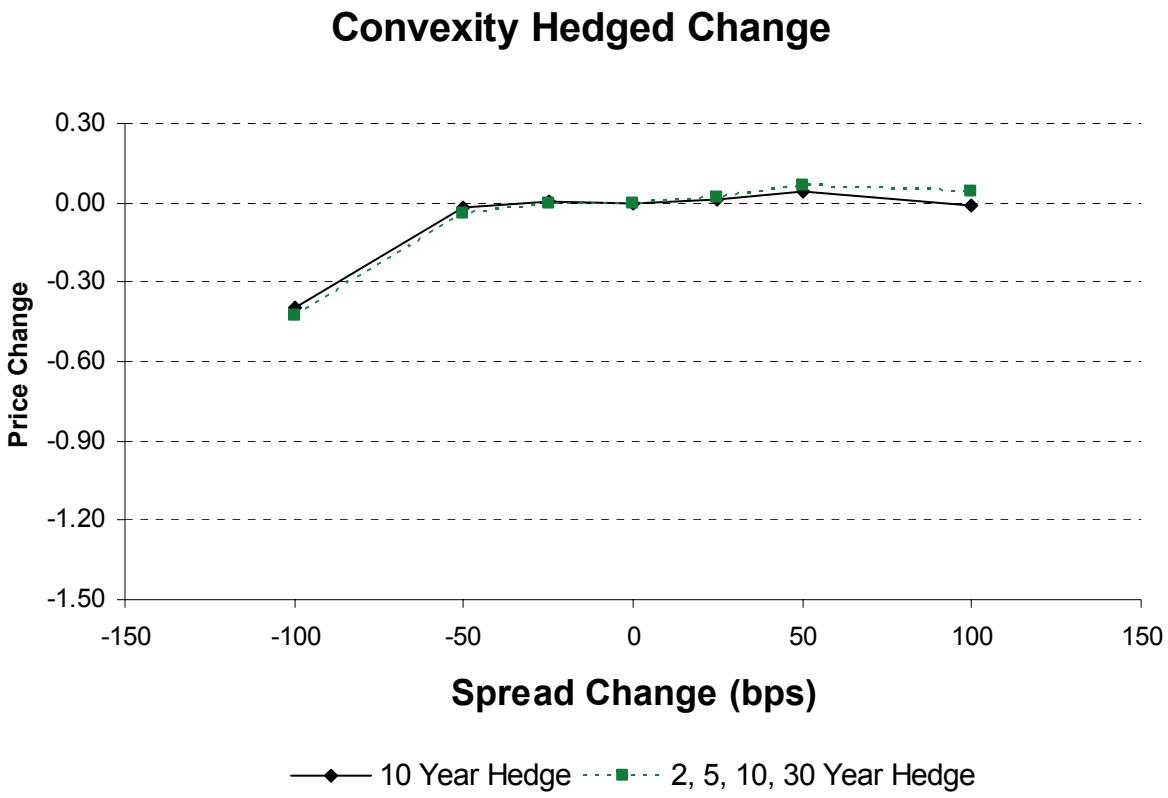
What happens if the yield curve shifts in parallel?



The portfolio incurs convexity costs for large yield movements

Duration and Convexity Hedging

With a static position in options, one can nearly eliminate the convexity cost.

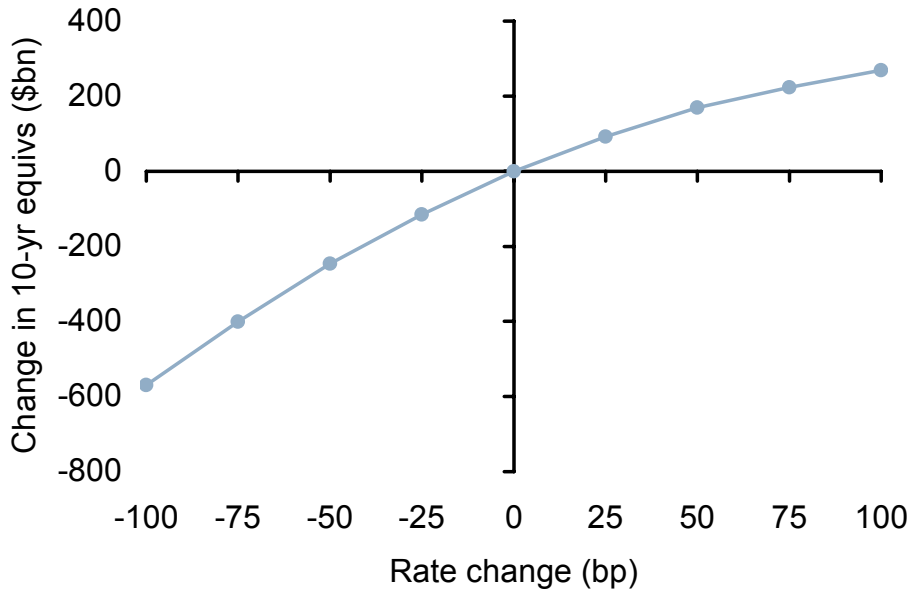


Note that multiple options are needed to completely hedge the convexity of the mortgage prepayment option.

Changes in mortgage market duration can impact the rates markets

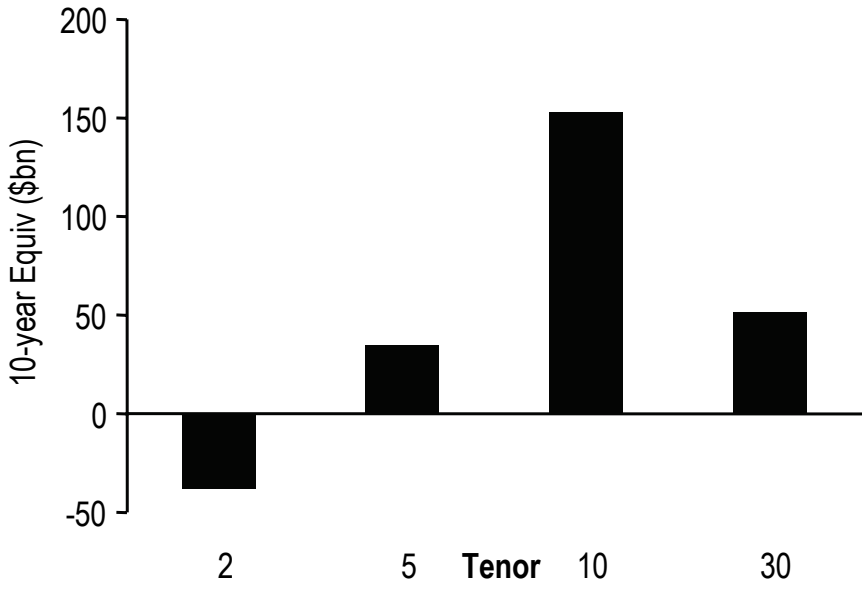
The rate of extension of the mortgage market will slow in a sell-off

Change in 10-year equivalents of the agency fixed rate market for various parallel shifts in rates



A sell-off could cause the curve to steepen

Change in 10-year equivalents for the mortgage market across the curve for a parallel +50 rate shock



Mortgages have embedded options – Investors need to hedge changes in vol as well….

- Homeowners have the right to prepay at any time during the life of the mortgage
- Consequently, an MBS investor is short many options to the homeowner:

		Underlying	
		Short	Long
Option	Short	1m x 1y	1m x 10y
	Long	5m x 1y	5m x 10y

- Term structure models are calibrated to the entire vol surface in swaptions
- Higher vol should cause mortgages to cheapen

FN 30	Vega	FN15	Vega
5.0	-0.21	4.5	-0.091
5.5	-0.26	5.0	-0.123
6.0	-0.27	5.5	-0.145
6.5	-0.23	6.0	-0.111

Source: JPMorgan

Where to find mortgage risk measures:

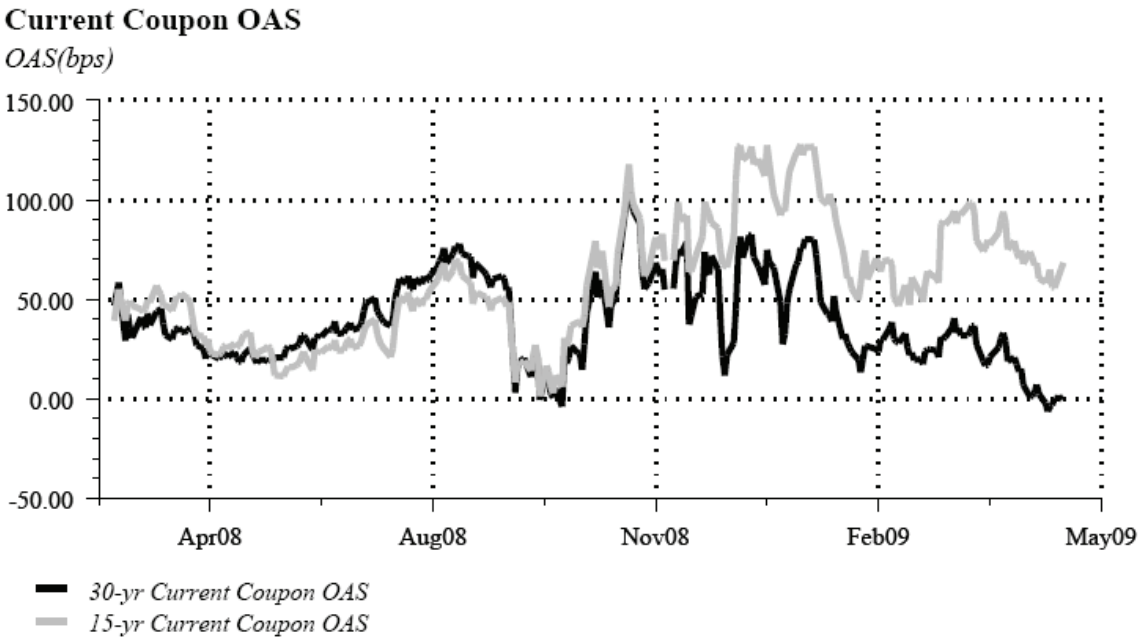
Front page of the JPMorgan mortgage daily packet

MBS Prices/Spreads (June)

								Price and Changes				Trader Hedge Ratio*			LIBOR ZSpreads					LIBOR OAS								CPR	
Bond	WAC	WAM	WALA	Avg LnSz	AL	Yield	Sprd UST	Last	1 Day Chg	1 W Chg	Cpn Swap	Last	1 Day Err	1 W Err	Last	1 Day Chg	1 W Chg	1M Chg	Option Cost	Last	1 Day Chg	1 W Chg	1 M Chg	OA Dur	OA Cnvx	Vega	OAS val per 1/32	Proj 1m	Proj 3m	Proj LT
FNMA 30																														
3.5	4.10	354	6	237	8.6	3.87	93	97-16+	0-05+	0-04		0.59	0-04+	0-05+	48	1	0	-34	43	5	1	5	-36	7.1	-0.0	-0.18	0.52	3	3	8
4.0	4.75	358	2	237	6.3	3.98	153	100-00	0-03+	0-02+	2-15+	0.49	0-03	0-04	70	2	1	-30	70	0	1	7	-30	6.0	-1.4	-0.23	0.60	4	4	13
4.5	5.10	358	2	259	3.6	3.91	235	101-24	0-03	0-04+	1-24	0.36	0-02	0-05+	100	2	0	-27	94	6	0	6	-27	4.7	-2.8	-0.23	0.71	11	13	23
5.0	5.63	352	8	246	1.7	3.19	238	102-24	0-04+	0-05	1-00	0.28	0-04	0-05+	127	0	1	-12	117	10	-3	6	-13	2.7	-4.1	-0.18	0.96	41	44	44
5.5	6.11	346	14	234	1.1	2.03	145	103-18	0-04	0-06+	0-26	0.24	0-03+	0-07+	131	-4	1	8	116	15	-4	4	-4	1.5	-3.2	-0.14	1.18	62	64	60
6.0	6.63	344	16	219	1.2	1.64	105	104-24+	0-02+	0-12+	1-06+	0.20	0-02	0-13+	132	-3	-4	-1	102	30	-2	-3	-19	1.4	-2.3	-0.13	1.17	58	59	58
6.5	7.21	342	18	194	1.2	0.97	36	106-09+	0-05+	0-21+	1-17	0.17	0-05+	0-22	91	-9	-15	-38	72	19	-6	-14	-55	1.0	-1.3	-0.11	1.21	58	59	58
FNMA 15																														
3.5	4.05	125	55	136	4.1	3.68	196	99-07	0-03+	0-03	2-11+	0.41	0-03	0-04+	101	1	6	-18	20	81	0	7	-21	3.7	-0.3	-0.05	0.90	8	8	9
4.0	4.67	178	2	154	3.9	3.59	194	101-09	0-02	0-03	2-02	0.33	0-01+	0-04	80	2	4	-19	56	24	1	6	-20	3.8	-1.6	-0.12	0.84	9	11	16
4.5	5.10	172	7	201	2.1	3.09	212	102-20	0-03+	0-04+	1-11	0.27	0-03	0-05	93	0	3	-10	81	12	-2	4	-11	2.1	-2.9	-0.11	1.10	39	41	34
5.0	5.56	169	11	173	1.4	2.19	152	103-14+	0-02	0-06	0-26+	0.23	0-01+	0-06+	92	-2	-1	-1	85	7	-2	0	-6	1.0	-2.2	-0.09	1.33	64	64	51
5.5	6.15	164	16	141	1.3	2.00	135	104-08	-0-00	0-12	0-25+	0.19	-0-00+	0-12+	97	1	-8	-2	65	32	1	-7	-9	1.2	-0.7	-0.07	1.36	65	65	52
6.0	6.50	159	21	139	1.4	1.79	111	105-15+	0-05+	0-16+	1-07+	0.17	0-05+	0-17	85	-7	-12	-29	55	30	-6	-13	-40	1.1	-0.2	-0.06	1.36	64	63	49
GOLD 30																														
3.5	4.00	354	6	240	8.7	3.97	102	96-28+	0-05+	0-04		0.59	0-04+	0-05+	58	1	0	-34	37	21	1	5	-36	7.1	0.2	-0.17	0.51	3	3	8
4.0	4.75	358	2	240	6.4	4.03	156	99-27+	0-03	0-01+	2-31	0.49	0-02	0-03	74	2	1	-29	68	6	1	8	-29	6.1	-1.3	-0.22	0.60	4	4	12
4.5	5.10	358	2	268	3.5	3.97	245	101-19+	0-02+	0-04+	1-24	0.36	0-02	0-05+	104	2	0	-27	94	10	0	7	-26	4.6	-2.8	-0.22	0.72	12	14	23
5.0	5.66	352	8	236	1.5	3.06	235	102-21+	0-04+	0-05	1-02	0.28	0-04	0-06	129	-1	1	-10	118	11	-4	6	-12	2.4	-4.1	-0.17	1.03	47	50	49
5.5	6.13	346	14	236	1.1	1.99	145	103-14	0-04	0-07	0-24+	0.24	0-03+	0-07+	133	-4	1	11	116	17	-4	3	-3	1.4	-3.1	-0.13	1.24	65	66	63
6.0	6.58	344	16	221	1.1	1.45	90	104-20+	0-02+	0-13+	1-06+	0.20	0-02	0-14	128	-4	-5	5	101	27	-2	-5	-15	1.2	-2.1	-0.12	1.24	63	64	62
6.5	7.14	342	18	190	1.2	1.10	50	106-05+	0-05+	0-19+	1-17	0.17	0-05	0-20	104	-9	-12	-26	77	27	-6	-12	-45	1.0	-1.3	-0.11	1.22	58	59	58
GNMA 30																														
3.5	4.00	354	6	200	8.0	3.95	112	97-06+	0-05+	0-08+		0.59	0-04+	0-10	58	1	-2	-34	36	22	1	2	-35	6.7	0.3	-0.15	0.54	4	5	9
4.0	4.50	358	2	200	7.1	4.00	133	100-00+	0-03	0-01+	2-26	0.49	0-02+	0-03	72	2	1	-28	55	17	2	8	-28	6.2	-0.6	-0.19	0.57	2	3	11
4.5	5.00	355	5	202	5.3	4.08	196	101-28	0-01	0-02+	1-27+	0.36	0-00	0-03+	100	3	1	-25	78	22	2	8	-24	5.0	-1.8	-0.21	0.67	6	7	15
5.0	5.50	351	9	211	2.6	3.54	238	103-13	0-05+	0-08	1-17	0.28	0-05	0-08+	119	-1	-1	-19	102	17	-3	4	-19	3.2	-3.5	-0.19	0.84	29	32	31
5.5	6.00	349	11	188	1.4	2.51	182	103-31+	0-05	0-11	0-18+	0.24	0-04+	0-11+	130	-3	-3	-6	105	25	-4	-1	-13	2.0	-2.7	-0.14	1.08	57	57	50
6.0	6.50	350	10	179	1.3	2.27	162	104-21+	0-03+	0-13+	0-22	0.20	0-03	0-14	140	-4	-4	0	90	50	-3	-4	-17	1.8	-1.7	-0.12	1.17	55	56	53
6.5	7.00	351	9	159	1.5	2.62	189	105-16+	0-06+	0-14+	0-27	0.17	0-06+	0-15	147	-8	-5	-21	65	82	-6	-5	-37	2.0	-1.4	-0.10	1.18	46	48	48
GNMAII 30																														
3.5	4.00	354	6	200	8.0	4.11	127	96-06+	0-05+	0-08+		0.59	0-04+	0-10	72	1	-2	-34	33	39	1	2	-35	6.7	0.3	-0.14	0.55	4	5	9
4.0	4.56	358	2	200	6.9	4.04	139	99-24+	0-03	0-03+	3-18	0.49	0-02+	0-05	76	2	0	-29	57	19	2	7	-28	6.2	-0.6	-0.19	0.58	2	3	11
4.5	5.06	355	5	202	5.0	4.07	204	101-24	0-01	0-03+	1-31+	0.36	0-00	0-04+	101	3	1	-25	79	22	2	7	-24	5.0	-1.9	-0.21	0.68	6	8	16
5.0	5.53	351	13	211	2.5	3.50	237	103-10	0-05+	0-09	1-18	0.28	0-05	0-09+	119	-1	-2	-20	102	17	-3	3	-20	3.2	-3.5	-0.18	0.85	31	34	32
5.5	5.96	349	8	188	1.5	2.65	193	103-28+	0-05	0-11	0-18+	0.24	0-04+	0-11+	134	-3	-3	-8	105	29	-4	-1	-14	2.1	-2.8	-0.14	1.05	55	56	49
6.0	6.45	350	9	179	1.4	2.39	172	104-18+	0-03+	0-14+	0-22	0.20	0-03	0-15	147	-3	-6	-3	93	54	-3	-5	-18	1.9	-1.9	-0.12	1.14	53	54	52
6.5	6.88	351	21	159	1.6	2.73	199	105-12+	0-06+	0-14+	0-26	0.17	0-06+	0-15	160	-8	-4	-20	72	88	-6	-5	-37	2.0	-1.4	-0.10	1.14	45	47	48
FNMA 20																														
4.0	4.50	230	7	218	5.6	3.92	169	100-09	0-03+	0-02+	2-24+	0.42	0-03	0-03+	83	2	3	-27	52	31	1	8	-29	5.0	-1.1	-0.15	0.69	6	6	11
4.5	5.10	230	6	218	3.0	3.65	230	102-05	0-03	0-04+	1-28	0.31	0-02+	0-05+	103	2	2	-25	84	19	-0	6	-27	3.4	-2.8	-0.17	0.85	19	21	26
5.0	5.58	229	7	195	1.6	2.91	216	102-30+	0-04+	0-05	0-25+	0.24	0-04	0-05+	124	-2	2	-6	102	22	-4	5	-8	1.9	-3.4	-0.14	1.10	46	48	46
5.5	5.94	230	11	160	1.3	2.19	158	103-23+	0-04	0-06+	0-25	0.20	0-03+	0-07	130	-3	1	8	99	31	-4	2	-1	1.2	-2.7	-0.11	1.24	59	60	56

Source: JPMorgan Pricing and Analytics Package, May 12, 2009

Tracking valuations historically: Current coupon OAS



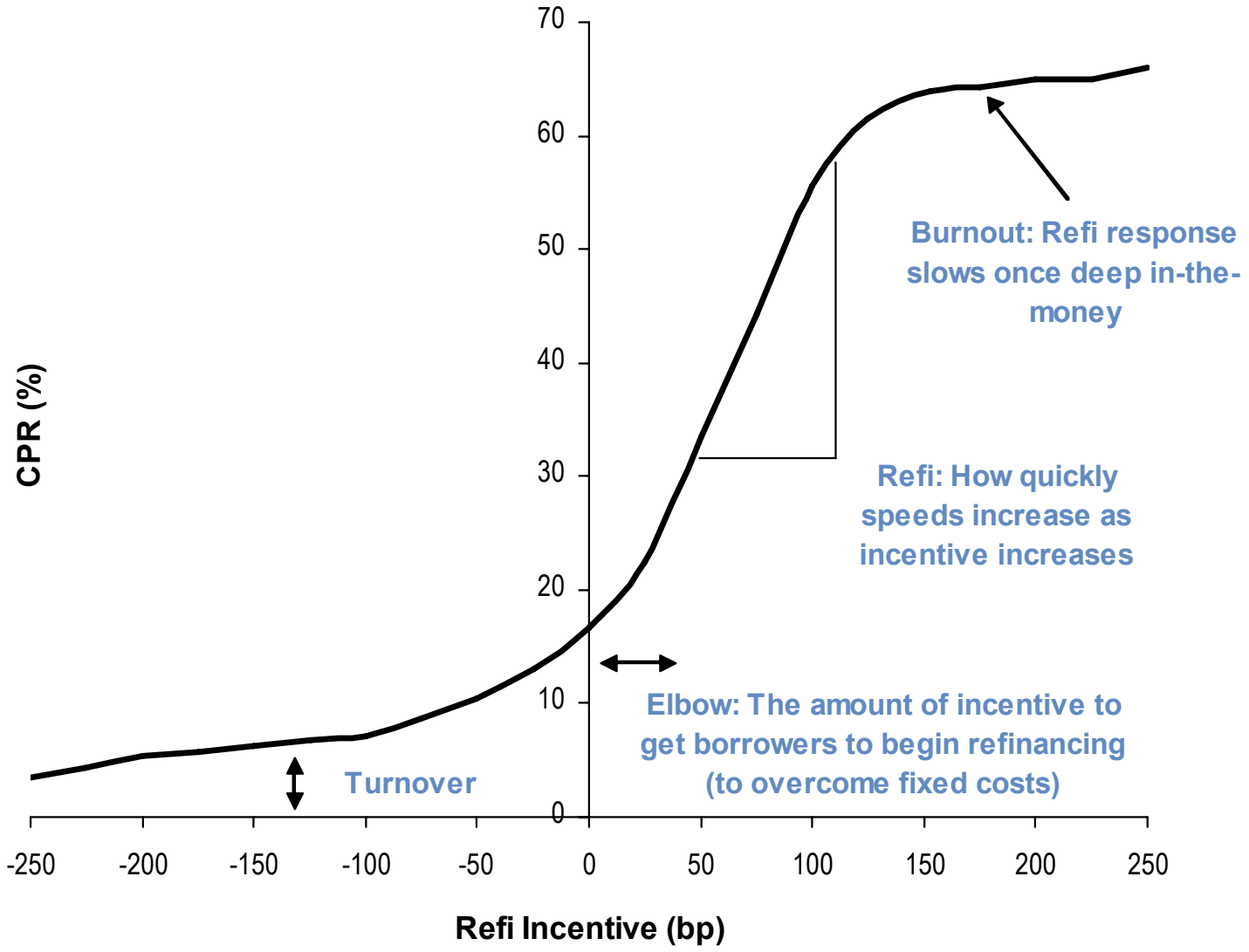
30Yr Current Coupon OAS

Curr	1-Day Chg.	5-Day Chg.	1-Mo Chg.
1.2	1.1	7.6	-29.5

	OAS	1-Mo	3-Mo	6-Mo	1-Yr
	Avg	7.8	21.1	36.7	41.3
	StD	11.2	12.6	23.2	23.6
	Lo	-6.4	-6.4	-6.4	-6.4
	Hi	33.0	40.5	82.6	105.4
StD 1D	Chg	4.4	4.4	8.8	8.9
StD 1W	Chg	9.6	9.6	20.4	19.8
StD 1M	Chg	15.8	16.4	23.9	30.6

Source: JPMorgan Pricing and Analytics Package, May 12, 2009

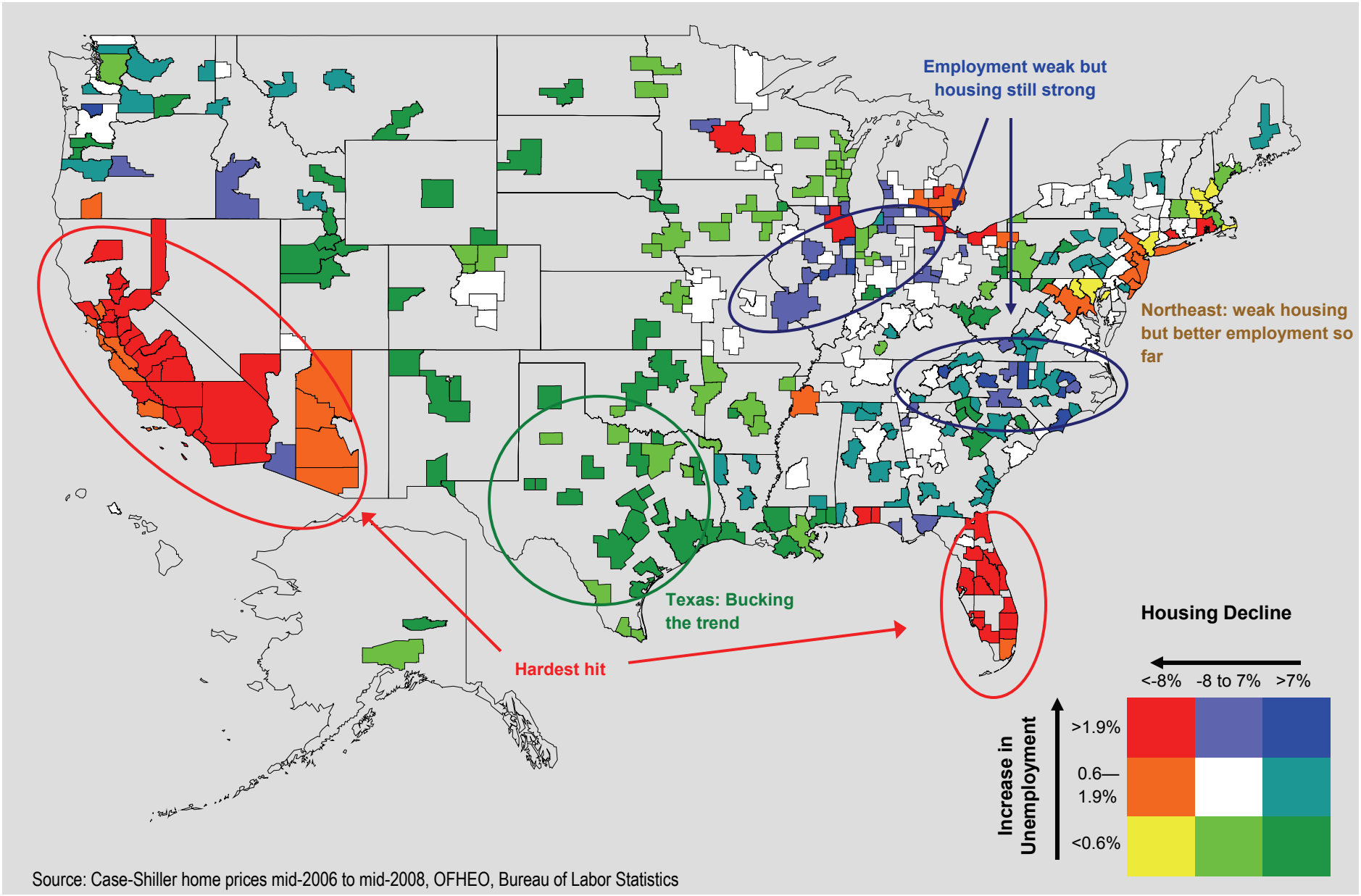
The Prepayment S-Curve



A closer look at prepayments: The major components

- Rate refinancing
  - Largest component of prepayments
  - Borrowers take advantage of lower interest rates to refinance
  - A steep curve can cause borrowers to refi into shorter mortgages (ARMs)
- Turnover
  - Prepayment occurs when borrower moves from one home to another
  - As loans age (or “season”) they show higher turnover speeds
  - Seasonality is an important driver of turnover, as most families move during the summer (when kids are out of school)
- Cash-out refinancing
  - Borrowers with accumulated equity can refinance and take out a larger mortgage
  - Cash can be used for home improvement, paying off bills, or other debt consolidation
  - This effect is driven primarily by home price appreciation (HPA)

Unemployment vs. HPA

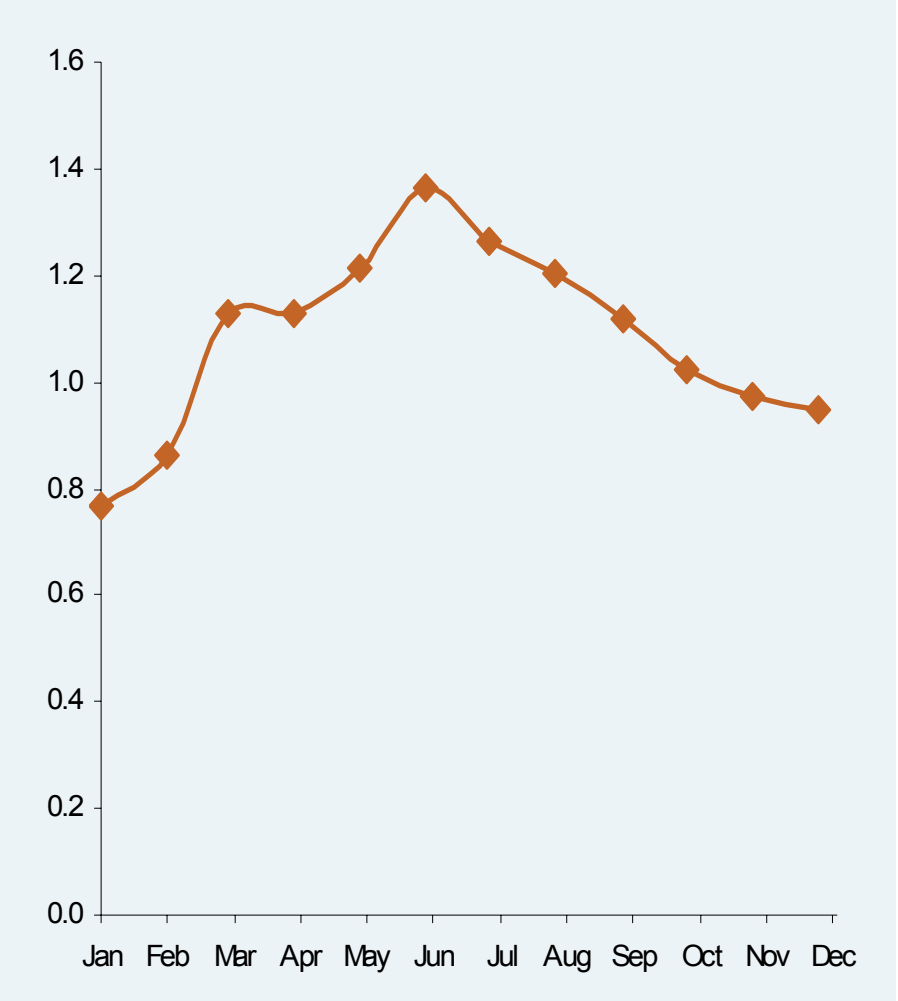


Source: Case-Shiller home prices mid-2006 to mid-2008, OFHEO, Bureau of Labor Statistics

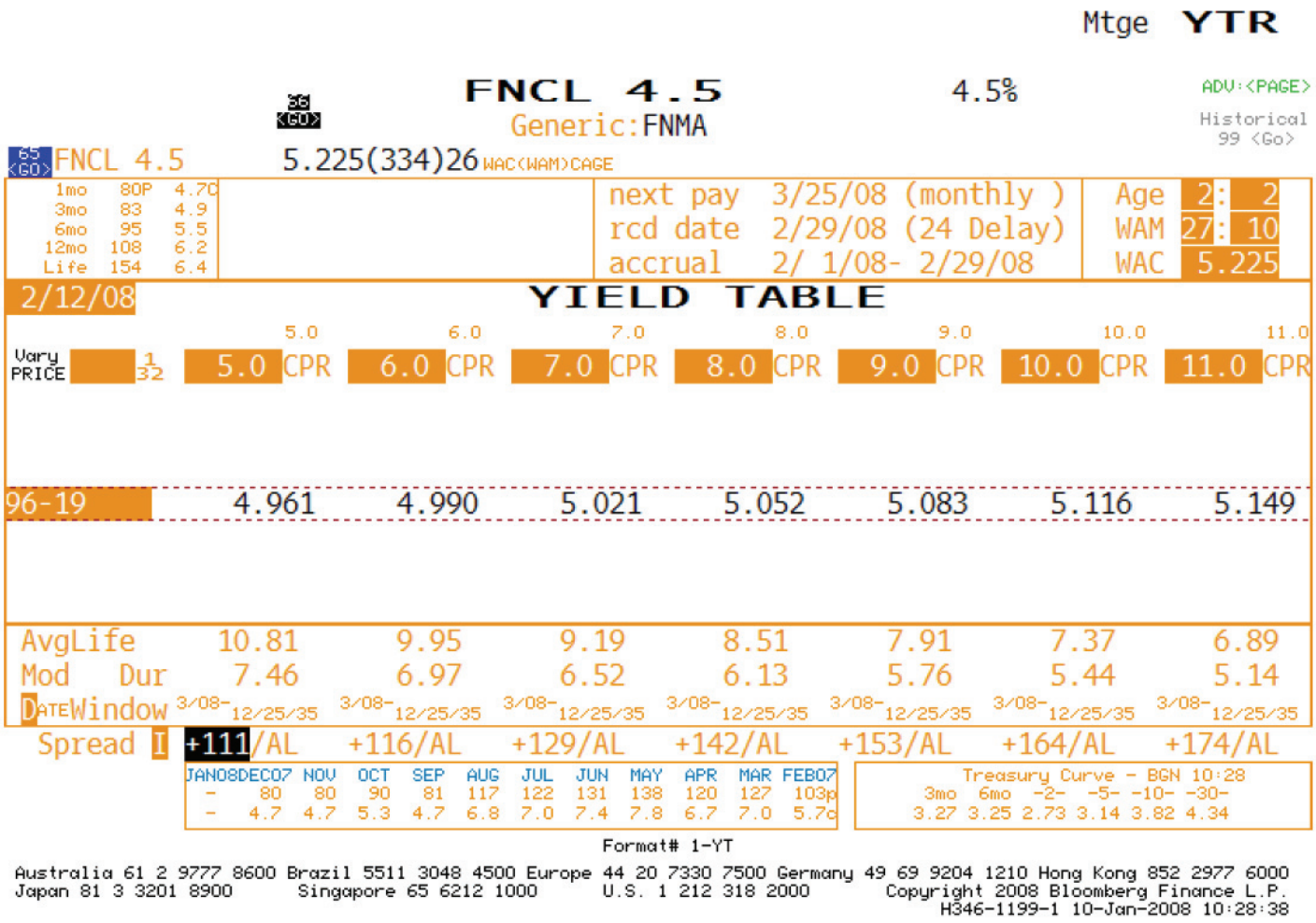
Seasonality in prepayments, especially turnover

Seasonality: Patterns tend to be impacted by weather and school schedules

- School schedules and weather conditions are the main reasons for seasonal behavior
- There is also a separate “day count” adjustment to account for different collection days in each month



Housing prices and turnover matter a lot for a discount mortgage …



J.P.Morgan

Prepayment reports: speeds by origination year

FNMA 30-Year											Prepayment (%CPR)													
Coupon	Orig Year	Curr Bal ($B)	Factor	WAC	WAM	WALA	Loan Sz Orig / Curr	LTV	FICO	Refi(%)	2009 Apr	1 Mo %Chg	3 Mo	6 Mo	12 Mo	Life	2009 Mar	2009 Feb	2009 Jan	2008 Dec	2008 Nov	2008 Oct	2008 Sep	2008 Aug	2008 Jul	2008 Jun	2008 May
3.50	GEN	0.4	0.9809	4.02	348	7	212 / 209	72	755	41	**0.3**	-56	0.1	0.8	1.4	1.9	0.7	0.0	0.1	3.7	0.9	0.1	0.1	3.6	0.1	0.4	5.6
	2009	0.3	0.9969	4.03	353	2	210 / 209	70	764	60	**0.4**	-58	0.1	0.0	0.0	0.5	0.9	0.0	0.0	-	-	-	-	-	-	-	-
4.00	GEN	44.4	0.9907	4.66	355	3	243 / 242	66	767	84	**1.2**	28	1.3	3.7	3.8	2.0	0.9	0.9	2.7	2.2	2.7	5.0	2.8	3.1	5.6	2.6	3.5
	2009	43.0	0.9959	4.66	356	2	246 / 244	66	768	85	**1.0**	23	1.0	0.0	0.0	0.8	0.8	0.7	0.0	-	-	-	-	-	-	-	-
	2008	0.8	0.9832	4.73	346	10	212 / 207	68	761	53	**6.7**	118	7.7	2.4	1.6	4.8	3.1	5.8	2.9	0.0	3.5	0.1	0.1	0.1	0.1	0.1	0.3
	2005	0.2	0.8967	4.62	306	48	195 / 179	68	723	53	**3.3**	115	2.1	2.2	2.6	2.9	1.5	1.4	1.9	2.6	3.3	2.1	0.9	2.8	6.2	2.4	3.3
	2003	0.4	0.6763	4.66	280	69	187 / 162	69	738	62	**9.4**	123	5.9	4.7	4.7	5.0	4.2	3.2	4.9	2.6	2.7	6.8	4.3	4.0	6.5	2.5	4.1
4.50	GEN	132.5	0.8734	5.06	338	19	224 / 215	68	756	76	**7.2**	22	9.7	7.5	6.1	6.2	5.9	8.4	7.1	3.6	3.0	4.0	4.1	4.3	5.0	5.4	5.2
	2009	87.6	0.9931	5.01	356	2	237 / 235	68	762	84	**3.3**	100	4.2	0.0	0.0	2.6	1.7	2.4	1.2	-	-	-	-	-	-	-	-
	2008	9.5	0.9371	5.26	346	11	247 / 239	69	753	65	**17.9**	40	14.4	4.6	3.1	5.8	12.8	12.3	6.5	1.8	0.8	1.4	1.3	1.2	1.4	1.3	1.4
	2007	0.5	0.9218	5.20	334	23	241 / 231	74	741	33	**10.3**	76	7.2	5.3	4.1	3.0	5.9	5.3	4.3	2.2	3.8	1.7	2.3	3.7	2.7	3.3	3.6
	2006	0.6	0.8720	5.21	319	32	230 / 208	64	760	58	**38.3**	49	29.7	5.5	4.6	13.1	25.8	23.8	18.8	3.8	4.3	3.7	1.3	1.0	3.6	6.2	6.0
	2005	8.8	0.7506	5.29	306	47	212 / 193	69	741	53	**15.3**	19	13.6	9.5	7.6	5.9	12.8	12.5	8.6	4.2	3.5	4.9	5.0	4.9	6.1	6.6	6.5
	2004	4.5	0.7283	5.12	291	59	198 / 176	68	743	62	**12.9**	25	11.1	8.1	6.5	6.0	10.4	10.4	7.5	4.1	3.3	4.4	4.8	5.3	5.4	5.3	4.9
	2003	20.9	0.6138	5.05	281	69	188 / 164	68	737	75	**11.4**	13	10.5	7.5	6.4	6.8	10.1	10.0	7.0	4.2	3.3	4.4	4.4	4.8	5.6	6.1	5.8
5.00	GEN	382.4	0.6585	5.59	309	44	200 / 182	70	736	64	**20.7**	13	19.5	13.2	9.5	9.1	18.3	18.7	12.9	5.3	3.4	5.2	4.6	5.0	5.8	6.2	6.7
	2009	21.0	0.9731	5.53	355	3	218 / 214	70	751	71	**15.7**	96	16.1	0.0	0.0	11.6	8.0	11.1	5.5	-	-	-	-	-	-	-	-
	2008	79.9	0.8992	5.66	346	12	238 / 228	72	746	64	**24.2**	18	22.3	14.5	8.5	9.4	20.5	22.2	17.3	5.1	1.6	2.4	2.1	2.0	1.9	1.8	1.8
	2007	17.8	0.8401	5.76	331	25	233 / 219	70	735	56	**24.3**	11	23.6	15.7	10.1	7.3	21.9	24.7	18.0	5.4	3.0	3.8	3.5	4.0	4.4	4.7	4.8
	2006	9.4	0.7704	5.79	320	34	218 / 202	69	734	49	**26.3**	11	25.1	17.7	12.0	7.7	23.7	25.2	18.1	7.5	3.4	5.8	4.9	5.3	5.5	6.7	6.4
	2005	95.0	0.6994	5.64	307	46	203 / 185	70	732	53	**19.2**	9	18.2	12.6	9.6	7.8	17.6	18.0	11.1	5.2	3.8	6.0	5.2	5.9	6.9	7.3	7.7
	2004	50.1	0.5876	5.53	291	59	188 / 168	69	732	60	**19.8**	7	18.5	12.6	9.6	9.0	18.5	17.1	11.0	5.3	3.7	6.1	5.4	5.6	6.6	7.2	8.0
	2003	108.3	0.5070	5.48	280	70	176 / 153	69	731	76	**19.6**	11	17.8	12.2	9.4	9.9	17.7	16.2	10.5	5.4	4.0	6.0	5.4	5.9	6.9	7.4	7.9
	2002	0.8	0.4116	5.63	267	78	159 / 134	71	735	57	**23.9**	2	22.6	14.8	11.0	11.5	23.4	20.6	12.4	4.8	3.0	6.3	6.1	5.6	6.7	7.0	9.1
5.50	GEN	593.9	0.5529	6.02	313	40	184 / 168	72	728	57	**26.8**	1	26.7	19.1	13.0	13.5	26.5	26.7	19.7	8.2	4.2	6.8	5.6	5.6	6.7	7.8	8.9
	2009	2.3	0.9492	6.06	354	3	177 / 173	74	733	50	**22.8**	20	22.2	0.0	0.0	18.4	19.0	15.3	14.1	-	-	-	-	-	-	-	-
	2008	128.0	0.8618	6.03	346	12	216 / 207	75	738	53	**29.6**	5	29.2	21.1	11.6	13.7	28.2	29.8	24.4	9.3	2.5	4.9	3.2	2.8	3.1	3.5	4.0
	2007	120.7	0.7817	6.13	333	23	217 / 204	73	728	51	**29.1**	-1	29.9	22.1	14.5	11.3	29.4	31.3	25.1	9.7	4.0	6.8	4.8	4.8	5.6	6.6	8.0
	2006	52.1	0.6941	6.15	321	34	212 / 196	72	728	50	**31.1**	-3	32.2	23.5	16.2	11.2	31.9	33.4	25.0	10.0	5.0	8.0	6.6	6.3	7.4	9.4	10.5
	2005	82.8	0.6353	5.98	308	46	170 / 157	73	717	53	**18.3**	-2	18.3	13.2	10.5	10.2	18.6	18.3	12.4	6.5	4.9	6.9	6.4	6.5	7.8	8.8	9.5
	2004	65.4	0.4885	5.92	293	58	162 / 145	72	720	51	**22.5**	0	21.9	15.4	11.7	12.7	22.4	21.0	13.6	6.4	4.6	7.0	6.6	6.6	8.3	9.1	9.9
	2003	115.0	0.3602	5.92	277	71	157 / 136	70	725	73	**25.9**	3	24.6	16.9	12.3	14.9	25.2	22.7	13.9	6.6	5.0	7.4	6.4	7.0	8.1	9.4	10.3
	2002	25.9	0.2593	6.00	269	78	157 / 133	70	733	73	**33.4**	2	32.1	22.3	15.8	17.6	32.8	30.1	19.0	8.2	5.4	8.0	7.1	7.2	8.8	10.1	11.1
	2001	1.1	0.1878	6.10	254	90	138 / 113	73	730	60	**32.8**	0	32.4	22.0	15.9	18.7	32.9	31.7	17.9	7.5	4.7	7.4	8.0	8.9	8.3	9.5	13.7
	1999	0.3	0.1663	6.12	219	122	120 / 91	73	728	49	**26.7**	-14	26.6	17.9	13.7	15.4	31.2	23.1	12.7	6.3	5.8	9.6	7.4	8.1	11.5	10.6	11.4
	1998	0.3	0.1285	6.20	213	127	120 / 89	74	729	48	**27.9**	3	26.1	17.9	13.8	16.9	27.2	22.5	14.0	5.7	5.9	8.0	8.6	7.3	8.6	11.6	11.4
6.00	GEN	408.4	0.4283	6.54	321	34	168 / 156	76	714	49	**24.5**	-7	25.7	19.5	13.9	18.3	26.2	26.6	20.7	10.9	6.2	9.6	6.9	7.1	8.6	10.7	12.9
	2009	0.8	0.9688	6.52	355	3	156 / 153	75	715	43	**17.2**	36	15.4	0.0	0.0	13.2	12.6	7.1	9.4	-	-	-	-	-	-	-	-
	2008	67.4	0.8418	6.53	347	11	189 / 181	78	722	43	**29.3**	-4	30.5	24.2	10.2	17.3	30.4	31.8	28.4	15.3	5.5	9.6	5.4	4.8	5.9	6.6	7.2
	2007	143.3	0.7690	6.57	336	21	189 / 180	78	712	49	**23.0**	-8	24.8	19.1	14.0	13.2	24.9	26.5	20.8	10.9	6.2	9.6	6.6	6.2	7.3	9.7	11.8
	2006	99.2	0.6423	6.56	321	34	183 / 171	74	716	47	**25.6**	-10	27.4	20.7	15.7	13.7	28.3	28.4	21.7	10.9	6.4	10.1	7.4	7.9	9.6	12.5	15.3
	2005	20.8	0.5453	6.50	310	45	138 / 129	78	700	46	**14.5**	-5	15.1	11.4	10.6	14.3	15.3	15.6	10.3	6.6	6.2	8.9	8.1	8.5	9.7	11.0	12.6
	2004	22.0	0.3640	6.41	294	58	136 / 123	77	708	41	**21.0**	-6	21.3	15.4	12.8	18.0	22.4	20.4	13.8	7.3	6.0	8.6	7.8	8.6	10.4	11.6	13.8
	2003	19.7	0.2317	6.46	279	71	125 / 111	74	708	64	**18.9**	-4	18.7	13.4	11.3	21.1	19.7	17.5	10.4	6.9	5.7	8.5	7.2	8.0	9.6	10.9	12.6
	2002	21.7	0.1335	6.49	266	80	131 / 112	73	720	66	**28.3**	-1	27.4	19.4	15.1	25.1	28.4	25.6	16.0	8.6	6.5	9.4	8.2	9.1	10.7	12.1	14.1
	2001	6.9	0.0834	6.56	253	92	125 / 104	74	720	63	**30.0**	-4	29.2	20.9	16.2	26.7	31.2	26.9	18.3	9.0	7.4	10.1	8.5	9.6	11.0	13.5	14.7
	1999	2.5	0.0698	6.62	219	122	115 / 88	74	721	57	**27.1**	6	24.6	17.6	14.1	21.9	25.5	21.9	14.0	8.7	7.6	9.8	8.5	9.1	10.5	11.5	14.2

Source: JPMorgan, FNMA (April 2009)

Prepayment reports: speeds by WALA

FNMA 30-Year											Prepayment (%CPR)														
		Curr *						Loan Sz	(%)		2009	1 Mo					2009	2009	2009	2008	2008	2008	2008	2008	2008	2008
Cpn	Age	Bal($M)	Factor	Wac	Wam	Ltv	Fico	Orig/Curr	Refi	Sato	Apr	%Chg	3 Mo	6 Mo	12 Mo	Life	Mar	Feb	Jan	Dec	Nov	Oct	Sep	Aug	Jul	Jun
3.50	1	102	0.998	3.98	357	69	766	225/225	-	-116	0.6	na	0.0	0.0	0.0	0.6	-	-	-	-	-	-	-	-	-	-
	2	116	0.997	4.06	349	72	761	204/203	63	-114	0.2	na	0.0	0.0	0.0	0.1	0.0	-	-	-	-	-	-	-	-	-
	3	70	0.995	4.04	356	69	767	198/197	62	-131	0.3	-83	0.1	0.0	0.0	0.9	2.0	0.0	-	-	-	-	-	-	-	-
	4	4	0.997	3.99	356	74	764	287/286	-	-191	0.0	-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-
	5	8	0.997	3.94	354	72	746	258/255	-	-248	0.1	100	0.0	0.0	0.0	0.1	0.0	0.1	0.8	0.1	-	-	-	-	-	-
	6	24	0.995	4.04	349	64	759	217/213	-	-233	0.5	-70	0.0	0.0	0.0	1.0	1.7	0.0	0.0	0.0	0.0	-	-	-	-	-
	7	5	0.990	4.00	353	87	724	243/240	-	-252	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	-	-	-	-
	8	6	0.988	4.00	352	88	726	281/277	-	-269	0.0	-50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
	9	2	0.987	4.00	351	94	722	286/283	-	-256	0.0	-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
	10	1	0.985	4.00	350	93	672	351/346	-	-242	0.0	na	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
	11	3	0.984	4.00	349	90	704	280/275	-	-226	0.0	na	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	12	4	0.981	4.00	347	80	753	302/296	-	-227	0.1	0	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2
	13	3	0.979	4.00	346	91	715	350/342	-	-233	0.0	0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
	14	7	0.979	4.00	345	86	729	307/301	-	-215	0.1	50	0.1	0.0	0.0		0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
	15	2	0.977	4.00	345	82	749	348/340	-	-243	0.0	na	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	16	4	0.976	4.00	344	87	744	285/279	-	-258	0.0	-67	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	17	2	0.975	4.00	343	85	696	266/260	-	-275	0.0	na	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18	5	0.970	4.00	340	88	686	277/269	-	-281	0.1	-75	0.2	0.2	0.2	0.2	0.4	0.1	0.1	0.0	0.2	0.1	0.2	0.1	0.2	0.3
	19	3	0.902	4.00	341	84	705	273/265	-	-289	0.0	na	0.0	0.0	7.1	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.8	0.0	0.0
	20	3	0.969	4.00	340	82	727	259/251	-	-299	0.0	0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	21	2	0.953	4.00	330	88	744	303/288	-	-294	0.3	0	0.3	0.2	1.0	0.8	0.3	0.3	0.3	0.3	0.1	0.0	1.3	0.7	0.3	7.5
	22	1	0.965	4.00	337	91	766	372/359	-	-269	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.0
	23	0	0.965	4.00	337	92	752	417/402	-	-251	0.0	0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.0

Source: JPMorgan, FNMA (April 2009)

How does the TBA market work?

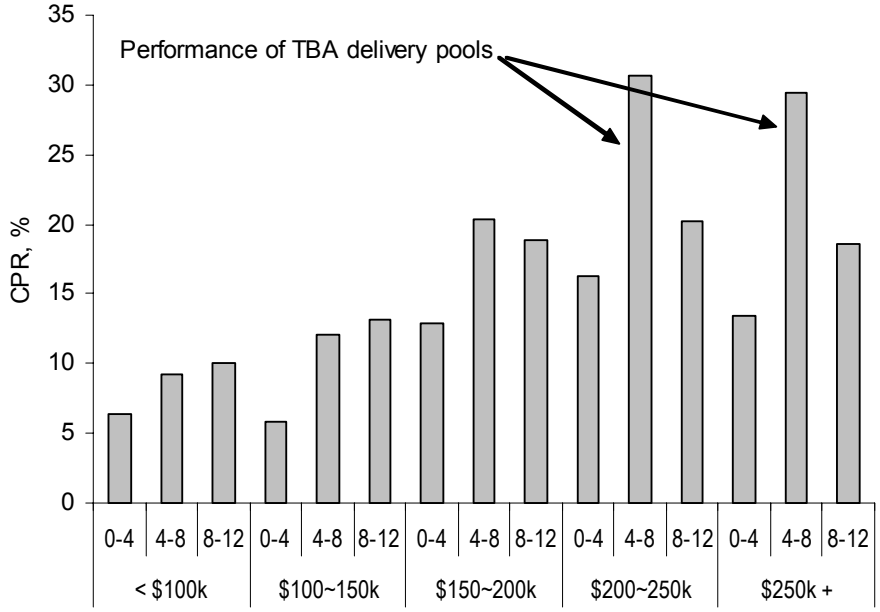
- The TBA mortgage market has been incredibly successful
  - Liquidity that is at least as good as in the Treasury market
  - Estimated $X billion trades daily as TBA on average
- What is TBA?
  - Buyer agrees to buy a coupon and program (e.g. 30-year 6s), but
  - Seller can decide what collateral to deliver (WAC, WAM, WALA, loan size, etc.)
  - Allows very large trades to occur (>$10 billion at times)
  - TBA trades settle on 1 day per month (a.k.a. PSA settle)
- The problem? The seller is long the delivery option, so the buyer will always get the “worst to deliver”
  - Highest loan size
  - Worst servicers
  - Adverse WALA

Collateral Performance Varies
TBA = Cheapest to Deliver

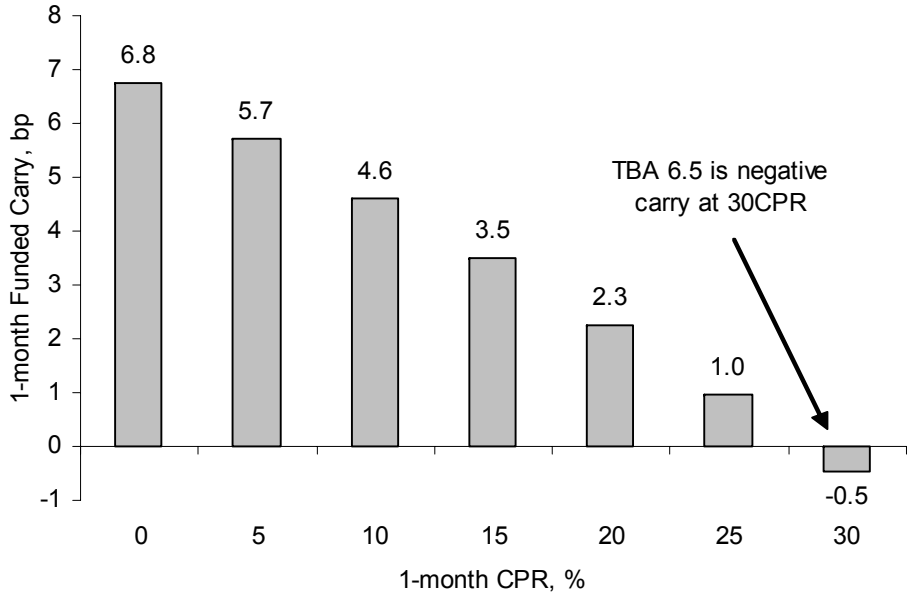
Realized return on MBS investments depends on collateral performance

Efficient allocation by dealers and investors and pooling by originators ensure that "cheapest" pools are delivered into the TBA market

Prepayments of FNMA 30-year 6.5% coupons in March 2007, grouped by age and loan size



Carry of $102 TBA FNMA 6.5s versus 1-month CPR, bp



Source: JPMorgan, Fannie Mae

Why consider specified pools?

- Avoid the uncertainty of TBA delivery
- Pick up value in specific loan characteristics
- Improve convexity relative to TBAs
- Match the mortgage index composition
- Anticipate demand from specific buyers

Demand for Specified Pools Comes from Many Sources

CMO

- CMO execution is often driven by model valuation
- Dealers arbitrage between collateral intrinsic value and demand from different investor types
- Collateral selection is important when buying structured securities, particularly for structures with leverage

Money Managers

- Indexed investors need exposure to specified pools as seasoned pools comprise 80% of the outstanding agency MBS universe
- Total return investors aim to reduce convexity hedging costs

FNMA and FHLMC

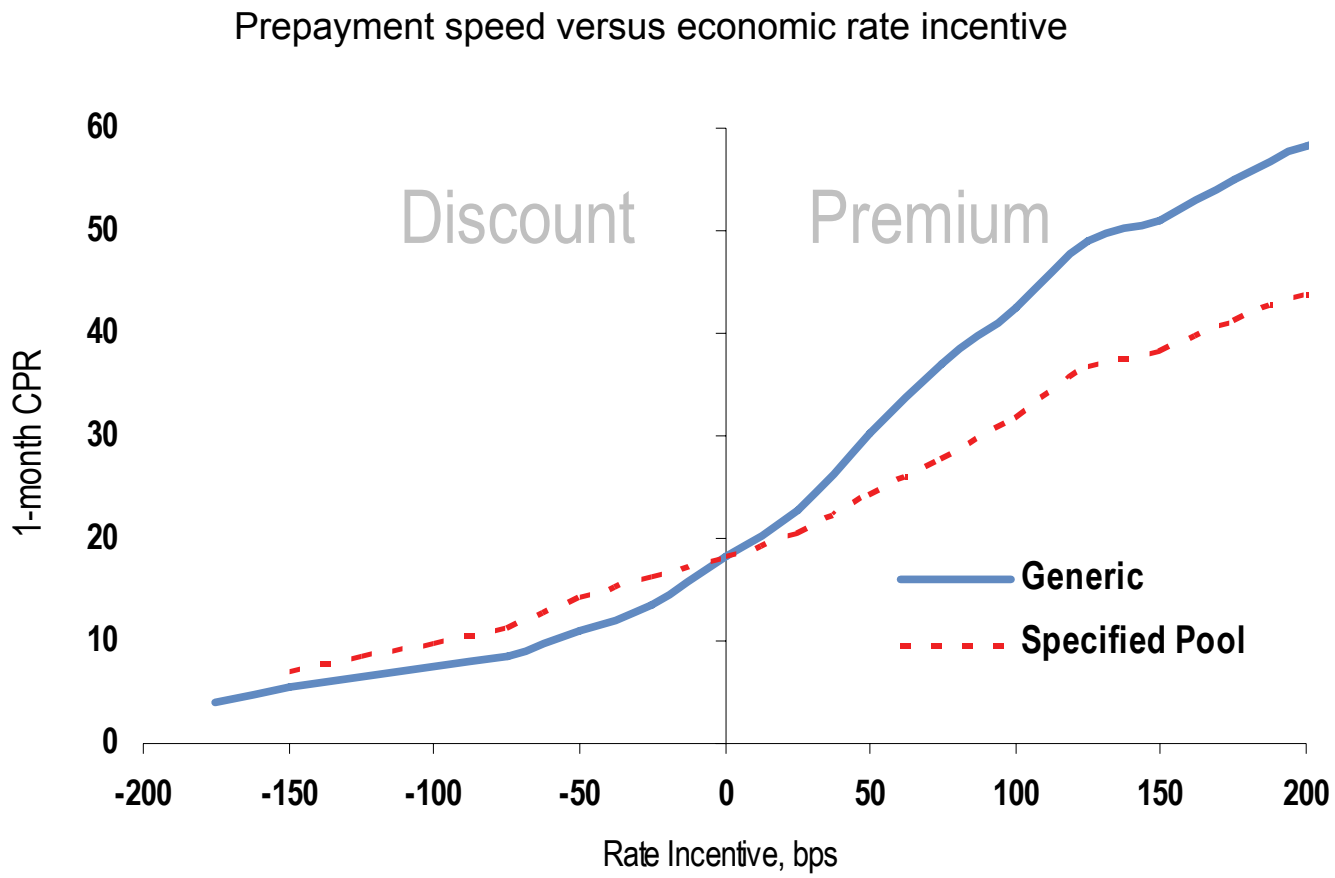
- Portfolio risk management and hedging are model dependant, thus improvements in portfolio convexity reduce hedging cost

Hedge Funds

- Buy/sell specified pools versus TBA to take advantage of relative value opportunities

Specified Pools Offer a Superior Prepayment Profile

Choosing the right pool attributes can lead to slower speeds as a premium (Call Protection) and faster speeds as a discount (Extension Protection)



Specified Pools Come In Many Flavors

Types of specified Pools

Attribute	Name	Definition	Purpose
WAC	Low WAC	Lower than average gross WAC	Call Protection
			Lower the WAC, slower the speeds
WALA	Seasoned Premium	Loan age > 24 months and older than TBA	Call protection
			Burnout: after the most reactive borrowers leave the pool, the remaining borrowers are less likely to prepay
	Seasoned Discount	Loan age > 12 months and older than TBA	Extension protection
Loan Size	LLB / $85k Max	Maximum loan size < $85k	Call protection
			Lower the loan size, slower the speeds
	MLB/ $110k Max	Max loan size < $110k	
	HLB / $150k Max	Max loan size < $150k	
	$175k Max	Max loan size < $175k	
Geography	Texas	All loans originated in Texas	Call Protection
	New York	All loan originated in NY	Call Protection
LTV	High LTV	90% LTV or higher	Call Protection
FICO	Low FICO	Credit Score < 620	Call Protection
			Credit impaired borrowers have fewer refinancing options
Occupancy	NOO – Non Owner Occupied	100% Investor property or 2nd Home	Call protection

Specified Pools: Quoted as price payups vs TBAs

Seasoned Pass-Through Prices and Spreads (June)

Orig. Year	Amount (MM)	WAC	WAM	WALA	LnSz Orig/Cur	LTV	FICO	Refi Share	NOO Share	OFHEO HPA	CS HPA	Top State	Price/ Payup	Yield	AL	Sprd UST	OAS	Chg 1W	Chg 1M	Option Cost	ZSprd	OA Dur	TBA HR	OA Cnvx	Projected CPR 1M	Projected CPR 3M	Projected CPR 1Y	Projected CPR LT	CPR History 1M	CPR History 3M	CPR History 1Y	Model Payup	% of Model
FNMA 4.5 30Y																																	
TBA	-	5.10	358	2	259.28	-	-	-	-	-	-	-	101-24	3.91	3.6	235	6	6	-27	94	100	4.67	1.00	-2.8	11.2	13.1	17.3	23.0	-	-	-	-	-
2008	9,504	5.26	346	11	250/ 239	69	753	65	0	-4	-14	18%CA	0	3.82	3.2	242	5	7	-25	96	101	4.31	0.92	-3.3	21.4	22.8	23.9	26.2	17.9	14.4	3.1	-0.5	0
2005	8,785	5.29	306	47	212/ 193	69	741	53	0	6	-16	15%CA	5.5	3.75	3.1	236	14	6	-24	87	101	4.21	0.90	-2.7	21.1	22.1	22.3	26.1	15.3	13.6	7.6	16.0	34
2004	4,525	5.12	291	59	202/ 176	68	743	62	0	19	-10	19%CA	7.5	3.85	3.8	223	22	7	-24	79	101	4.35	0.93	-2.3	15.6	16.3	16.1	21.1	12.9	11.1	6.5	29.5	26
2003	20,935	5.05	281	69	188/ 164	68	737	75	0	29	0	22%CA	9	3.89	4.2	214	27	7	-24	74	101	4.43	0.95	-2.0	13.5	14.0	13.6	18.8	11.4	10.5	6.4	38.5	24
FNMA 5.0 30Y																																	
TBA	-	5.63	352	8	245.95	-	-	-	-	-	-	-	102-24	3.19	1.8	238	10	6	-13	117	127	2.71	1.00	-4.1	41.4	44.6	47.0	44.3	-	-	-	-	-
2008	79,938	5.66	346	12	238/ 228	72	746	64	2	-5	-15	18%CA	0	3.19	1.8	238	12	6	-13	115	127	2.76	1.02	-4.1	44.4	46.1	47.1	44.1	24.2	22.3	8.5	2.0	0
2007	17,819	5.76	331	25	235/ 219	70	735	56	1	-10	-25	22%CA	0	3.13	1.7	234	18	6	-12	110	129	2.91	1.07	-3.6	44.5	45.7	45.5	44.9	24.3	23.6	10.1	8.5	0
2006	9,412	5.79	320	34	219/ 202	69	734	49	1	-8	-24	20%CA	1	3.10	1.7	231	20	6	-11	108	128	2.87	1.06	-3.4	44.3	45.6	45.9	45.2	26.3	25.1	12.0	11.0	7
2005	95,003	5.64	307	46	203/ 185	70	732	53	1	-0	-20	17%CA	4	3.41	2.1	245	28	6	-13	102	130	3.18	1.18	-3.3	35.5	36.6	36.7	37.4	19.2	18.2	9.6	24.0	17
2004	50,120	5.53	291	59	189/ 168	69	732	60	1	17	-11	22%CA	6	3.59	2.5	248	35	6	-13	96	131	3.31	1.22	-3.0	30.5	31.5	31.2	32.5	19.8	18.5	9.6	35.0	18
2003	108,249	5.48	280	70	176/ 153	69	731	76	2	28	-1	22%CA	8.5	3.69	2.7	247	40	6	-13	91	131	3.41	1.26	-2.8	27.6	28.4	28.1	29.6	19.6	17.8	9.4	44.0	19
FNMA 5.5 30Y																																	
TBA	-	6.11	346	14	233.52	-	-	-	-	-	-	-	103-18	2.03	1.1	145	15	4	-4	116	130	1.54	1.00	-3.2	62.4	63.6	63.6	60.3	-	-	-	-	-
2008	127,957	6.03	346	12	217/ 207	75	738	53	4	-4	-14	16%CA	0	2.17	1.2	157	17	4	-5	116	133	1.57	1.02	-3.4	62.0	63.1	62.9	58.6	29.6	29.2	11.6	1.5	0
2007	120,672	6.13	333	23	218/ 204	73	728	51	2	-8	-22	14%CA	0	2.31	1.3	169	28	4	-5	111	138	1.98	1.29	-3.0	58.0	58.8	58.7	56.6	29.1	29.9	14.5	11.0	0
2006	52,125	6.15	321	34	212/ 196	72	728	50	2	-7	-24	15%CA	2.5	2.19	1.2	158	25	4	-4	109	134	1.87	1.22	-2.8	58.1	59.1	58.9	57.2	31.1	32.2	16.2	11.5	23
2005	82,771	5.98	308	46	171/ 157	73	717	53	5	-0	-20	13%CA	5.5	3.01	1.7	222	46	5	-7	105	151	2.49	1.62	-3.0	45.7	46.9	46.7	44.8	18.3	18.3	10.5	36.5	15
2004	65,413	5.92	293	58	162/ 145	72	720	51	3	12	-10	17%CA	8.5	3.17	1.9	231	50	4	-8	101	151	2.61	1.70	-2.8	43.3	44.4	43.5	41.3	22.5	21.9	11.7	45.5	19
2003	115,044	5.92	277	71	157/ 136	70	725	73	4	30	0	20%CA	12	3.19	2.0	230	53	4	-7	97	150	2.62	1.71	-2.7	42.2	43.0	42.0	39.8	25.9	24.6	12.3	52.5	23
2002	25,860	6.00	269	78	157/ 133	70	733	73	1	35	7	17%CA	13.5	3.07	1.9	222	51	4	-7	95	146	2.53	1.65	-2.6	44.6	45.2	44.0	41.4	33.4	32.1	15.8	50.5	27
FNMA 6.0 30Y																																	
TBA	-	6.63	344	16	219.09	-	-	-	-	-	-	-	104-24+	1.64	1.2	105	30	-3	-19	103	132	1.42	1.00	-2.3	58.3	59.0	59.6	58.4	-	-	-	-	-
2008	67,424	6.53	347	11	189/ 181	78	722	43	10	-4	-14	15%CA	0	1.43	1.1	85	22	-4	-19	101	123	1.20	0.84	-2.2	62.7	63.3	63.0	60.6	29.3	30.5	10.2	-6.0	0
2007	143,260	6.57	336	21	189/ 180	78	712	49	6	-7	-21	10%CA	0	1.48	1.2	89	25	-4	-19	98	123	1.33	0.94	-2.0	61.6	62.4	62.2	60.0	23.0	24.8	14.0	-3.5	0
2006	99,244	6.56	321	34	183/ 171	74	716	47	6	-7	-23	11%CA	1.5	1.19	1.1	63	18	-5	-18	91	108	1.13	0.80	-1.7	64.9	65.4	64.4	62.1	25.6	27.4	15.7	-8.0	0
2005	20,762	6.50	310	45	138/ 129	78	700	46	16	1	-18	12%FL	11	2.55	1.7	178	56	-2	-20	94	150	2.23	1.58	-2.1	48.0	49.0	49.4	46.1	14.5	15.1	10.6	37.0	30
2004	22,028	6.41	294	58	136/ 123	77	708	41	11	14	-7	11%CA	20	2.66	1.8	183	56	-2	-20	90	146	2.29	1.62	-1.9	47.9	48.5	47.0	42.9	21.0	21.3	12.8	47.5	43
2003	19,704	6.46	279	71	125/ 111	74	708	64	18	30	2	15%CA	25	2.90	2.0	199	66	-1	-20	82	149	2.61	1.86	-1.6	44.0	44.5	42.8	39.0	18.9	18.7	11.3	64.5	39
2002	21,709	6.49	266	80	131/ 112	73	720	66	7	37	9	14%CA	32	2.81	2.0	189	64	-2	-19	76	139	2.65	1.89	-1.3	45.2	45.4	42.9	38.7	28.3	27.4	15.1	68.5	47
2001	6,855	6.56	253	92	125/ 104	74	720	63	2	47	19	13%CA	32	3.03	2.2	204	74	-2	-20	69	143	2.89	2.06	-1.1	43.0	43.0	40.3	36.0	30.0	29.2	16.2	81.0	40
1999	2,537	6.62	219	122	115/ 88	74	721	57	1	81	47	13%CA	32	3.29	2.4	220	91	-2	-19	57	148	3.05	2.17	-0.8	38.7	38.6	35.8	32.2	27.1	24.6	14.1	100.5	32
FNMA 6.5 30Y																																	
TBA	-	7.21	342	18	194.32	-	-	-	-	-	-	-	106-09+	0.97	1.2	36	19	-14	-55	72	91	0.98	1.00	-1.3	58.0	58.9	59.8	57.6	-	-	-	-	-
2008	17,415	7.00	347	11	160/ 155	80	699	44	26	-4	-13	13%CA	0	1.87	1.5	117	50	-11	-51	89	140	1.57	1.60	-1.9	50.2	50.7	51.0	50.4	19.2	19.7	12.5	29.5	0
2007	39,178	7.09	336	21	154/ 149	83	688	43	13	-6	-19	11%FL	0	1.67	1.4	99	43	-12	-52	79	122	1.51	1.54	-1.4	53.9	54.5	54.5	52.0	17.4	18.0	13.0	21.5	0
2006	37,653	7.02	322	34	148/ 140	79	700	44	15	-5	-21	13%FL	1	1.45	1.4	79	34	-14	-53	72	106	1.36	1.38	-1.0	57.6	57.9	57.1	53.5	18.0	19.0	13.8	14.5	8
2005	2,690	6.98	311	44	115/ 108	81	686	45	25	3	-16	12%FL	8.5	2.59	1.9	173	73	-10	-49	75	148	2.33	2.37	-1.2	45.5	46.2	46.5	41.9	13.4	12.9	10.9	64.5	13
2004	2,770	6.96	295	58	113/ 104	82	687	40	24	15	-5	9%FL	17	2.82	2.1	188	78	-9	-48	70	148	2.55	2.61	-0.9	46.5	46.5	44.3	38.2	12.7	12.7	10.9	81.5	21
2003	1,637	7.05	282	69	103/ 93	80	686	53	30	28	3	8%CA	23	3.19	2.4	212	93	-9	-47	62	155	2.98	3.05	-0.7	42.0	41.8	39.0	33.6	12.6	11.5	9.7	107.5	21
2002	10,246	6.96	264	84	113/ 97	76	706	59	10	40	13	11%CA	34	3.25	2.6	210	96	-8	-46	58	154	3.13	3.22	-0.6	38.7	38.3	34.7	31.3	20.3	20.5	13.5	124.5	27
2001	7,450	7.00	253	93	109/ 92	76	708	58	6	45	19	10%CA	34	3.41	2.7	219	104	-8	-45	54	158	3.29	3.39	-0.6	36.5	36.0	32.3	29.6	22.4	21.3	14.1	135.5	25
1999	3,139	6.97	221	121	101/ 79	75	713	53	4	75	42	12%CA	34	3.55	2.9	227	114	-8	-45	47	162	3.31	3.41	-0.4	33.5	33.1	29.6	27.4	22.4	21.0	13.5	148.5	23

Source: JPMorgan MBS Pricing and Analytics Package, May 12, 2009

Valuing loan balance and geographic pools

Specified Pools Prices and Spreads (June)

Spec Type	WAC	WAM	WALA	Price	Payup	Yield	AL	Sprd UST	Model PSA	CF DUR	LIBOR OAS	LIBOR ZSpread	LIBOR OADur	LIBOR OACnvx	Projected CPR 1M	Projected CPR 3M	Projected CPR 6M	Projected CPR 1Y	Projected CPR LT	B-even Payup	B-even %
FN 5.0 30Y																					
TBA	5.63	352	8	102-24		3.186	1.75	238	997	1.65	10	127	2.71	-4.14	41.4	44.5	46.7	47.0	44.3		
LLB	5.63	352	2	103-15	23.0	3.841	3.53	233	526	3.12	36	123	4.71	-2.27	17.8	19.7	21.6	23.7	23.9	60.8	38
MLB	5.63	352	2	103-07	15.0	3.762	3.04	241	632	2.74	32	126	4.33	-2.67	21.4	23.5	25.8	28.1	27.5	43.8	34
M125	5.63	352	2	103-04	12.0	3.661	2.71	245	729	2.47	26	126	4.03	-2.97	24.3	26.7	29.2	31.7	30.5	32.8	37
HLB	5.63	352	2	103-03	11.0	3.411	2.23	241	927	2.07	15	125	3.52	-3.45	29.5	32.2	35.1	37.8	36.2	17.3	64
M175	5.63	352	2	102-28	4.0	3.319	1.96	243	1092	1.84	14	127	3.28	-3.69	32.8	35.8	39.0	42.0	40.3	8.5	47
FN 5.5 30Y																					
TBA	6.11	346	14	103-18		2.027	1.15	145	1238	1.11	15	130	1.54	-3.19	62.4	63.6	64.6	63.6	60.3		
LLB	6.11	346	2	104-19	33.0	3.497	2.60	233	767	2.38	53	142	3.96	-2.16	27.8	29.9	32.4	34.7	31.7	81.5	40
MLB	6.11	346	2	104-07	21.0	3.276	2.14	231	982	1.99	46	145	3.48	-2.49	33.4	35.8	38.6	41.0	37.7	58.1	36
M125	6.11	346	2	104-02	16.0	3.030	1.84	219	1184	1.73	39	143	3.10	-2.71	37.8	40.3	43.4	46.0	42.5	42.9	37
HLB	6.11	346	2	103-30	12.0	2.497	1.46	180	1587	1.39	24	136	2.46	-3.00	45.2	48.0	51.3	54.1	51.0	21.3	56
M175	6.11	346	2	103-24	6.0	2.186	1.26	157	1895	1.21	18	134	2.11	-3.14	49.8	52.8	56.4	59.3	56.7	9.1	66
FN 6.0 30Y																					
TBA	6.63	344	16	104-24+		1.644	1.20	105	1132	1.17	30	132	1.42	-2.31	58.3	59.0	60.1	59.6	58.4		
LLB	6.63	344	2	105-28+	36.0	3.316	2.46	221	825	2.26	72	156	3.68	-1.71	28.7	30.5	32.8	35.0	33.4	89.5	40
MLB	6.63	344	2	105-17+	25.0	2.949	2.02	204	1059	1.89	62	154	3.14	-1.96	34.4	36.4	39.0	41.4	39.6	61.7	41
M125	6.63	344	2	105-09+	17.0	2.649	1.75	184	1271	1.65	54	150	2.75	-2.10	38.8	41.0	43.8	46.3	44.5	43.1	39
HLB	6.63	344	2	105-05+	13.0	1.932	1.39	126	1666	1.33	33	135	2.03	-2.27	46.4	48.8	51.8	54.4	52.9	16.5	79
M175	6.63	344	2	104-31+	7.0	1.475	1.20	88	2000	1.16	23	125	1.62	-2.32	51.0	53.6	56.9	59.7	58.4	1.3	
FN 6.5 30Y																					
TBA	7.21	342	18	106-09+		0.973	1.23	36	1068	1.21	19	91	0.98	-1.26	58.0	58.9	60.1	59.8	57.6		
LLB	7.21	342	2	107-13+	36.0	3.290	2.58	214	780	2.36	90	162	3.57	-1.30	27.0	28.6	30.7	32.7	32.1	125.0	29
MLB	7.21	342	2	107-01+	24.0	2.858	2.13	190	990	1.98	77	155	3.02	-1.46	32.4	34.2	36.5	38.7	37.9	89.6	27
M125	7.21	342	2	106-25+	16.0	2.484	1.85	164	1182	1.74	66	147	2.61	-1.55	36.7	38.5	41.0	43.3	42.5	65.8	24
HLB	7.21	342	2	106-21+	12.0	1.644	1.48	94	1556	1.42	39	121	1.87	-1.61	43.9	45.9	48.7	51.1	50.4	31.2	38
M175	7.21	342	2	106-15+	6.0	1.107	1.29	48	1830	1.25	24	104	1.41	-1.61	48.4	50.6	53.6	56.2	55.7	10.9	55
FN 7.0 30Y																					
TBA	7.74	343	17	107-18		1.733	1.56	100	899	1.50	58	117	1.49	-1.12	45.3	46.4	47.8	48.5	48.6		
LLB	7.74	343	2	108-02	16.0	4.000	3.07	264	632	2.72	146	206	3.97	-1.04	18.8	20.2	21.7	23.6	27.6	130.7	12
MLB	7.74	343	2	107-26	8.0	3.655	2.63	248	765	2.38	133	199	3.52	-1.21	22.4	24.0	25.7	27.8	31.7	98.4	8
M125	7.74	343	2	107-22	4.0	3.348	2.34	230	882	2.15	122	191	3.18	-1.31	25.4	27.0	29.0	31.1	35.0	76.3	5
HLB	7.74	343	2	107-20	2.0	2.718	1.95	183	1108	1.82	98	170	2.57	-1.44	30.6	32.4	34.6	36.9	40.8	43.4	5
M175	7.74	343	2	107-19	1.0	2.251	1.74	145	1281	1.64	81	153	2.16	-1.49	34.0	35.9	38.4	40.9	44.8	23.6	4

LLB-$85K Max Loan Size, MLB-$110K Max Loan Size, M125-125K Max Loan Size, HLB-$150K Max Loan Size, M175-175K Max Loan Size

Source: JPMorgan Pricing and Analytics Package, May 12, 2009

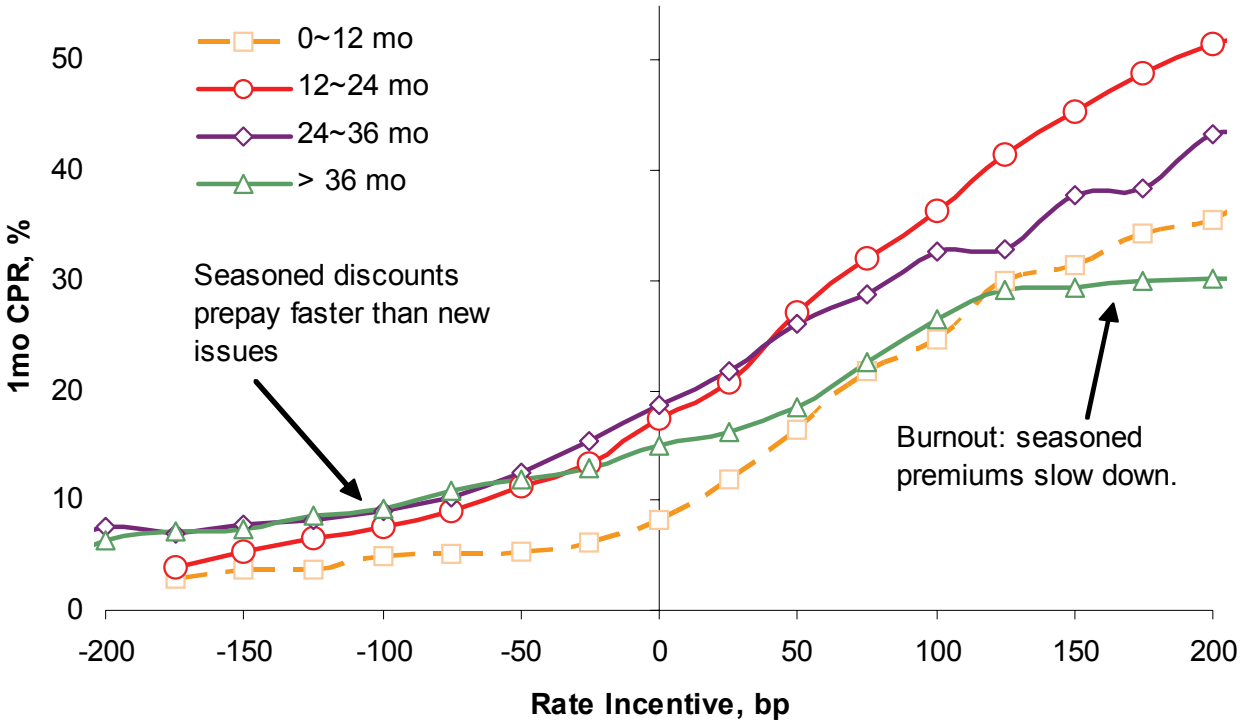
Loan Attribute: WALA (Loan Age)
Prepayment Convexity Improves With the Passage of Time

WALA (weighted average loan age) measures time elapsed in months from when borrowers took out the loan

- Seasoned Premiums: slower prepayments
  - Seasoned collateral that has been "in-the-money" for an extended period of time is considered to have "burnout"
  - Pools will start to slow-down as the most negatively convex, or the most reactive, borrowers prepay out of the pool
  - The surviving borrower population is less reactive to rates and can have more desirable attributes such as lower loan balances
- Seasoned Discounts: faster prepayments
  - Home tenure is how long a borrower has been in the current home
  - Longer the home tenure, more likely a borrower will move, leading to faster speeds
  - Monetize equity gains in their homes and curtail their loan
  - Built-in equity enables faster turnover speeds via increased mobility ("trade-up"), greater cash-out activity, and flexibility to refinance to different product types

Loan Attribute: WALA (Loan Age)
Prepayment convexity improves with the passage of time

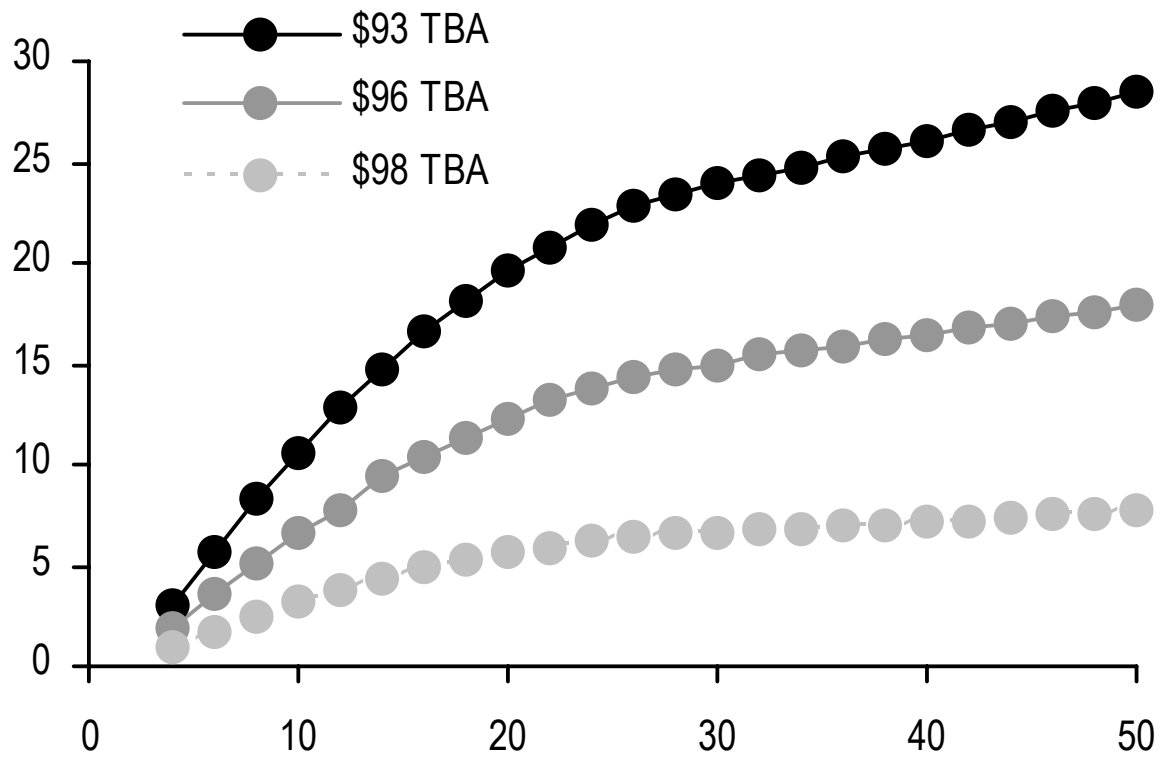
One month CPR versus Rate Incentive, in 2005~2006



Source: JPMorgan, Fannie Mae

Seasoned Discounts:
Fundamental value increases as dollar prices decline

Fair value payups by WALA for discount TBAs at different price levels, assuming constant libor static Z spread to TBA.



Loan Attribute: Loan Size
The Lower the Loan size, the Slower the Speeds

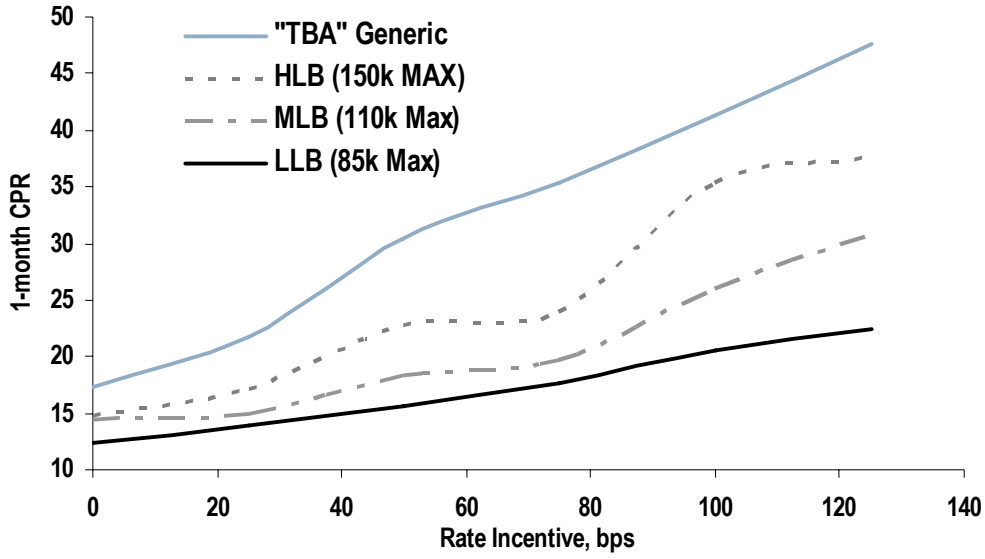
Borrowers with lower loan balances have less incentive to refinance – the fixed costs of refinancing represent a larger percentage of their monthly savings

Monthly Breakevens Refinancing from a 7% to 6% Rate

Loan Size	Monthly Savings	Months to BE
$ 65,000	$ 34	59
$ 100,000	$ 52	38
$ 130,000	$ 68	29
$ 300,000	$ 158	13

*assumes $2,000 Closing Costs

Loan Balance S-Curves



Loan Attribute: Geography
It is not just HPA

Regional prepayment differences are due to

- **Housing market**
- **Demographics & economy**
- **Taxes and fees**
  - **New York's mortgage recording tax is >2% in the metro area and >1% in the rest of the state**
  - **Other states with mortgage tax: Alabama, Florida, Georgia, Maryland, Minnesota, Oklahoma, Tennessee, Virginia**
- **Other factors**
  - **Cashout refinancing restrictions in Texas**
    - **Borrowers can only cash-out refi once per year**
    - **Cash-outs can only go to 80 LTV max**

Relative value strategies and analysis

Trading Strategies
Mortgage - Swap basis
Mortgage - Tsy basis
Coupon swap
15s / 30s
Ginnie / Fannie
TBA / Seasoned
Agency / Non-agency
Pass-through / ARM
CMO / Collateral

Evaluation Approaches
OAS
Spread
Hedge-Adj Carry
Regressions
Deliverable
Sponsorship

"I don't know whether mortgage rates had gone up. Now may I continue?"