

Time to Fix the US Mortgage Market

August 22nd, 2011



Why No Refinancing Wave Despite Historically Low Rates?

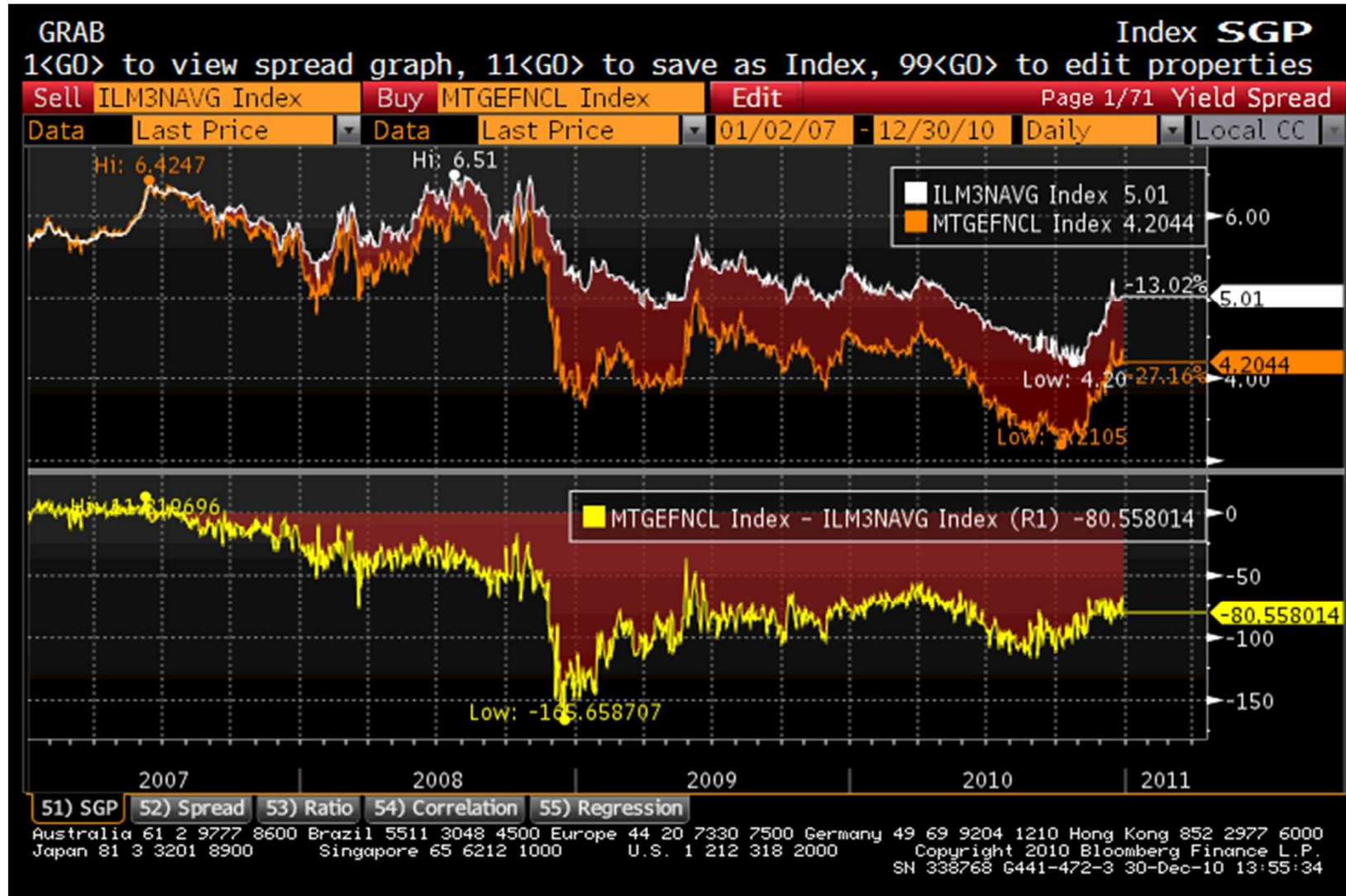
- 1. Low rates have not resulted in a refinancing boom in the current downturn.**
 - In the fall of 2008, the Fed lowered rates to historic lows. The Fed Purchase Program was designed to make credit more affordable for homeowners.
 - A wave of refinancing applications ensued in early 2009
 - But few refinancings were actually closed, and applications have tailed off
 - At current mortgage rates, prepayment speeds (CPR) should be 60%.
 - Instead they are 15%.
- 2. Why?**
 - Costs of refinancing above the bond market cost of funds have soared.
 - The rate that existing, performing borrowers actually receive is 50-200 bps higher than the headline 30-year rate. This is poorly understood.
 - Driven by upfront fees charged by the GSEs, uncompetitive mortgage banking industry and mis-categorization of MSRs in Basle III
- 3. Impact?**
 - Monetary policy transmission is frustrated by transaction costs.
 - Lower rates do not result in refinancings that increase homeowners' discretionary income
 - This should have become permanent income without affecting the federal budget and creating Riccardian equivalency issues.
 - \$67 billion in additional, annual permanent and discretionary income for 25mm systemically important households is lost.

Growth in Primary/Secondary Spread

- The spread (green area in graphs below) between primary mortgage loan rates (orange line in top graph) and mortgage bond yields (white line in top graph) has grown during financial crisis.
 - Primary/Secondary spread has been close to zero for 20 years
 - First bounced up to 10-30bp range in mid-2007 when the financial crisis began
 - When Countrywide was taken over in early 2008, spread moved to the 30-50bp range
 - Spread blew out in October of 2008 when the remaining competitive mortgage banks were taken over by uncompetitive large banks (WAMU went to JPM and Wachovia to Wells Fargo)
- The primary/secondary spread is understated, because it reflects only those loans that are funded. It does not measure loans that do not close because the rates are too high to be economic for the borrower.
- This unmeasured effect is called "Type II error" If these were included, the primary/secondary spread would be an additional 100bp wider



Primary/Secondary Spread



The Dog That Didn't Bark: GSEs and lack of competition



1. GSE's are trying to recapitalize themselves while in "conservatorship"

- Charging higher "G-fees" for guaranteeing MBS
- Tighter underwriting standards
- Every loan is assessed a ¼ point Adverse Market Delivery Charge (AMDC)
- Additional Loan Level Pricing Adjustments (LLPAs) are charged for low FICO, high LTV, property type, mortgage type, investor property
- Part of the LLPAs are directed to the struggling mortgage insurance (MI) industry, as the GSEs depend upon MI solvency
- Most borrowers who are current on a GSE guaranteed loan face 3 points of LLPA fees upon a refinancing

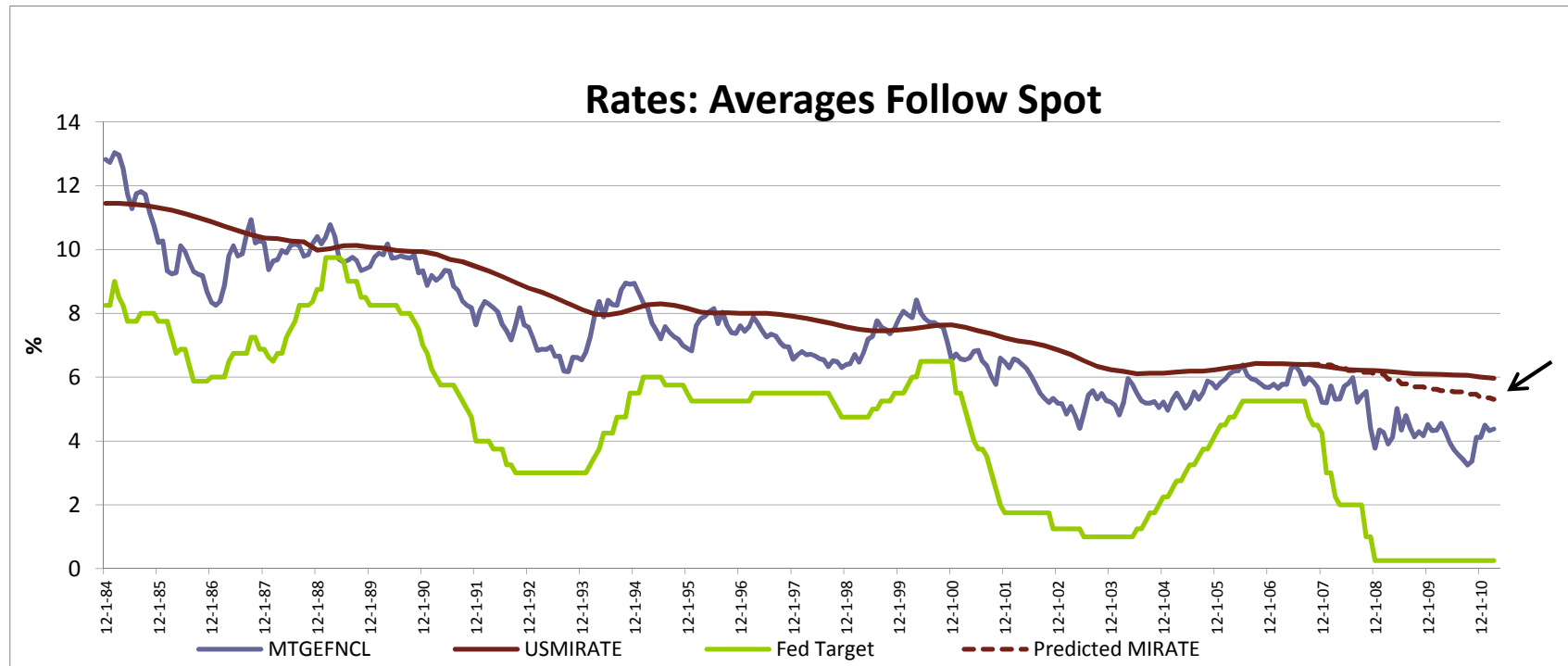
2. Mortgage banking is highly concentrated and uncompetitive

- 55% in top 3 originators control the TPO channels
- Profit margins increased as the competitive mortgage banks have been assimilated into the large, uncompetitive banks
- Remaining lenders are cautious response to aggressive loan put backs
- No expansion of staff to deal with surge in demand for refinancing.
 - Staffing levels running less than half of mid-2007 levels
 - Lack of industry capacity led to extraordinary profit margins

3. Basle III discourages the creation and holding of MSRs(see pages 42-46)

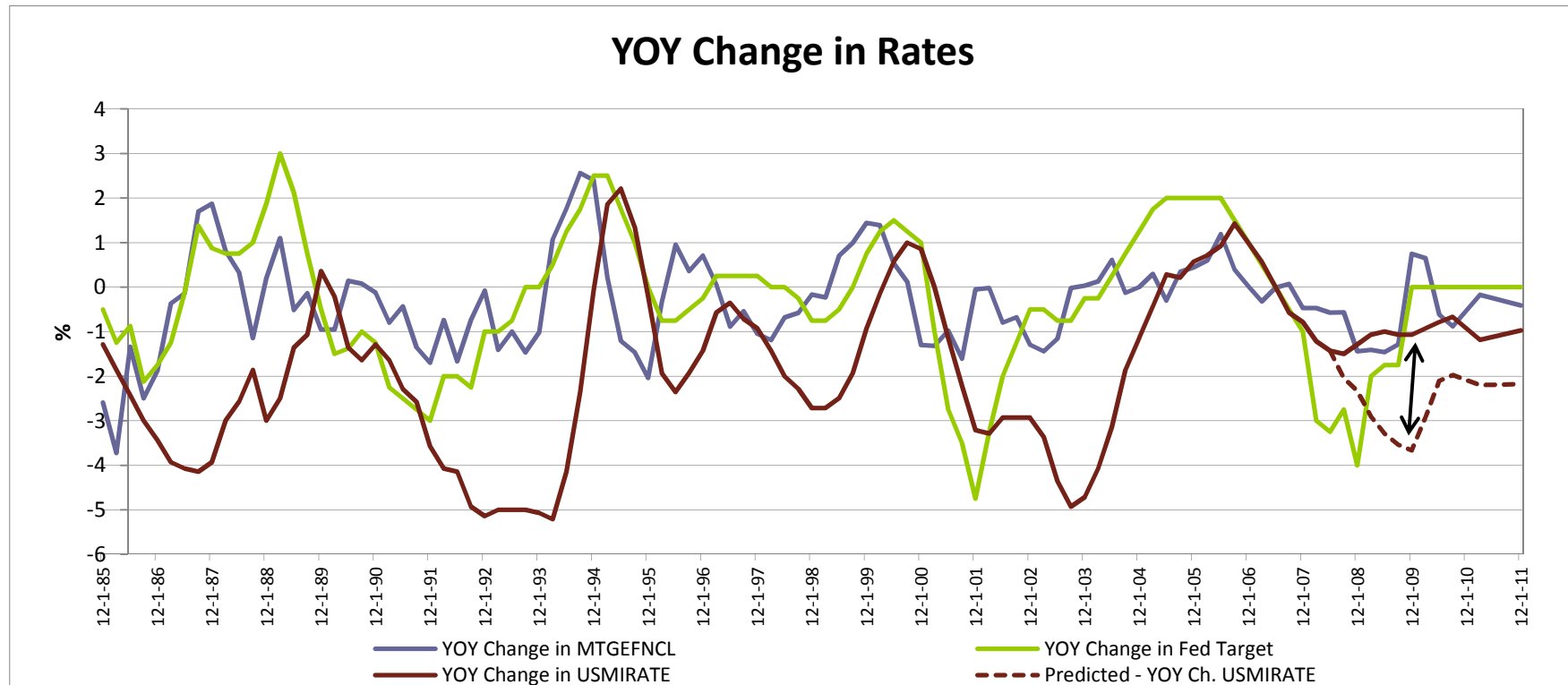
- MSRs , once viewed as the only "skin-in-the-game" , have dropped by 70%
- MSR and loan servicing are being driven out of regulated financial institutions
- Impact on every new mortgage loan is over 25bp

Refinancing is the Monetary Policy Transmission Mechanism



- To stimulate the economy, the FOMC reduces the fedfunds target rate
- Yield curve steepens, increased carry drives bond market rally
- Higher MBS prices (should) lead to lower mortgage rates to households
- Households exercise their contractual right to prepay their mortgages, without penalty
- Significant annual interest saving are taken into permanent income, which alters savings/consumption
- Increase in aggregate demand leads to higher employment, personal income and production

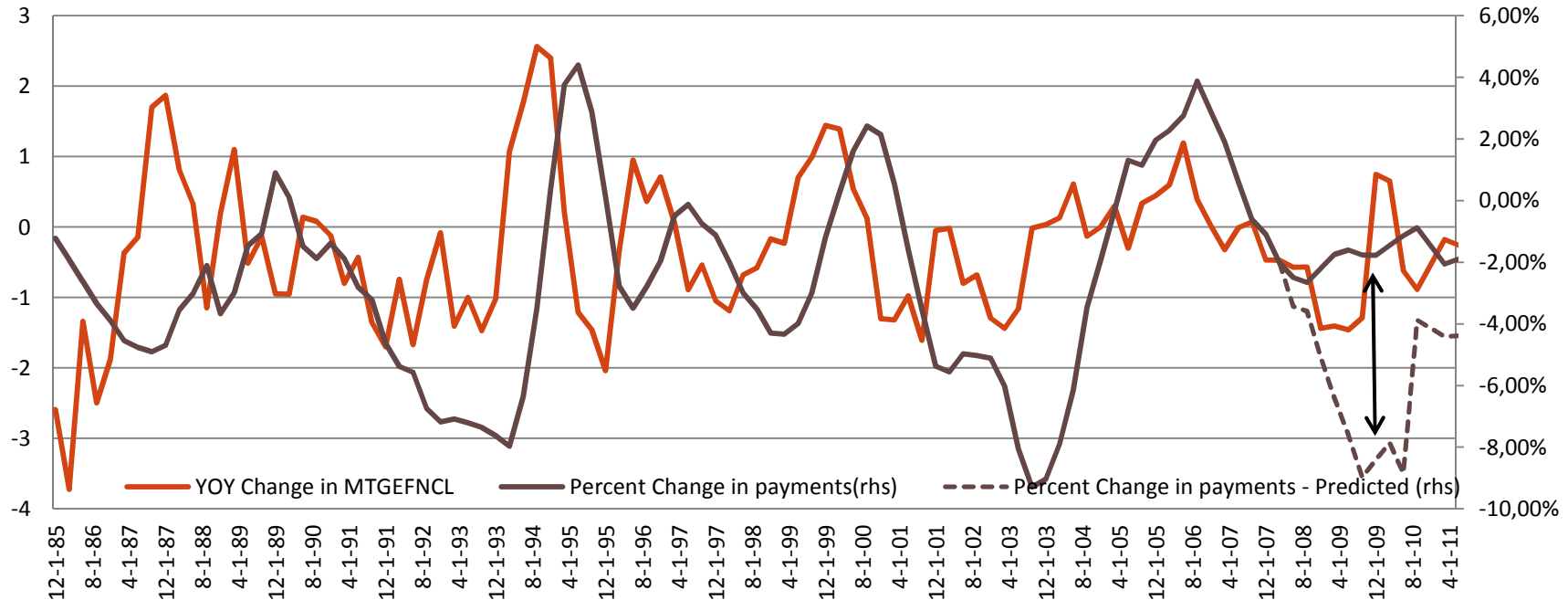
Changes in Market Rates Drives Outstanding Mortgage Rates



- The change in bond prices and interest rates is what matter
- In this rate cycle, actual rates offered to consumers are NOT following rates implied in the bond market, which has stopped intended refinancing wave
- An OLS model estimate suggests the MIRATE (weighted average mortgage rate paid by households) is 93 bp higher than it should be given the current coupon 30 year FNMA and the fed funds target rates

Historical Benefits of Refinancing: Percent Change

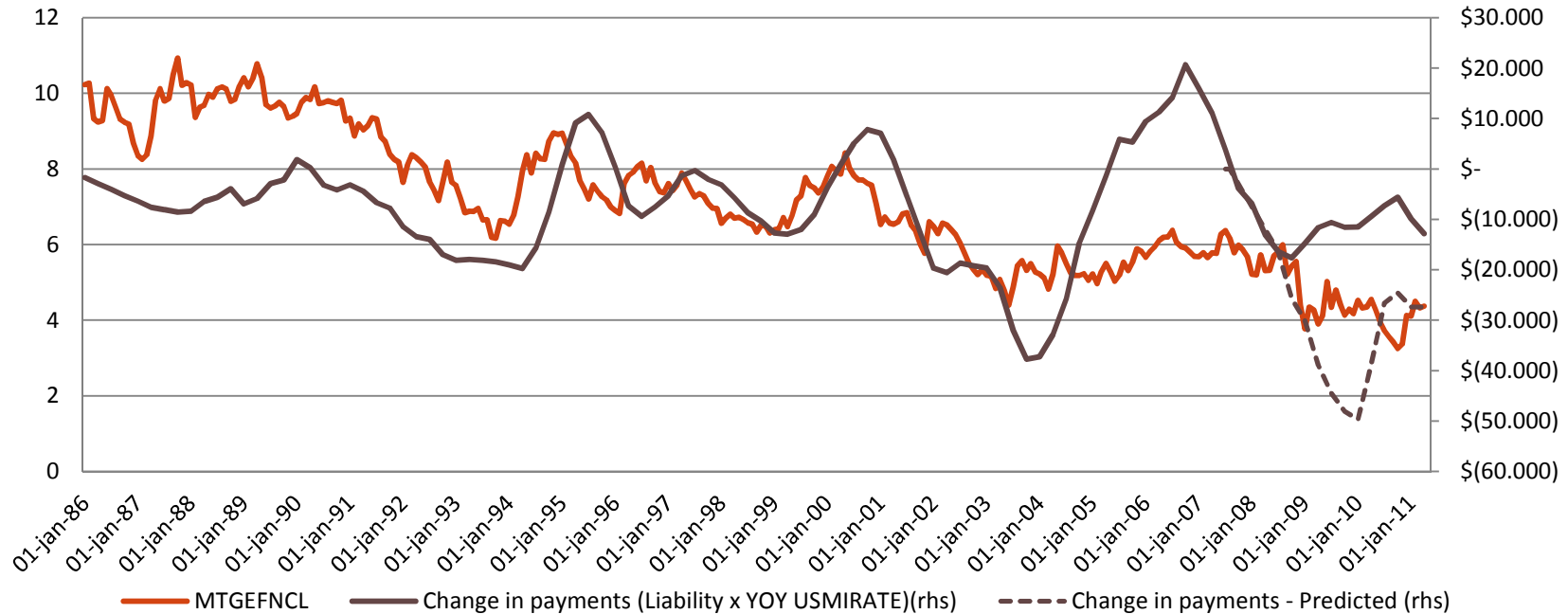
Historical Benefits of Refinancing



- Regression models show the potential benefit of changes in interest payments
- The drop in households' home mortgage interest payments has been small compared to prior cycles
- Refi wave in 1991/94 had a 202 bp drop in MIRATE which led to \$47 billion in annual savings
- Refi wave in 2001/04 had a 134 bp drop in MIRATE which led to \$67 billion in annual savings
- Refi wave in 2007/10 had a 45 bp drop in MIRATE which has led to \$45 billion in annual savings

Historical benefits of refinancing: Dollars Saved

Historical Benefits of Refinancing: Dollars Saved



- Regression models show the potential benefit of changes in interest payments
- Despite easy monetary policy and historically low mortgage rates, a major refinancing wave has failed to materialize
- A properly functioning mortgage system you put \$67 billion in annual disposable income back into our economy
- Bottom line, the most important monetary policy transmission mechanism has been impaired

Historical Benefits of Refinancing: Household Savings



- Refinancings result in *permanent* annual cost savings to households, not just one-time savings.
 - Refi wave in 1991/94:
 - 202 bp rate drop, \$2.3T mortgage outstandings → \$47 billion in annual savings.
 - Refi wave in 2001/04:
 - 134 bp rate drop, \$5T mortgage outstandings → \$67 billion in annual savings.
 - Refi wave in 2007/11 with traditional primary/secondary market spread, and with full monetary transmission:
 - 112 bps, \$10T mortgage outstandings → \$112 billion in annual savings.
 - Refi wave in 2007/11 (actual):
 - 45 bp rate drop, \$10T mortgage outstandings → \$45 billion in annual savings.
- **Growth of primary/secondary market spread has cost US households \$67 billion in annual savings. Savings would go to the 25mm households who are current on their existing loans but are unable to refinance due to LLPAs, restrictions on MSRs and less competitive pricing from the big banks.**

Mortgage pricing 101: August 19th, 2011



	Mythical Zero Point Borrower	Borrower 1	Borrower 1	Borrower 2	Borrower 4
FICO/CLTV	700/80	750/60	750/60	739/75.01	699/75.01
AMDC	0.00	0.00	0.00	0.25	0.25
LLPAs	0.00	0.00	0.00	0.50	1.75
Loan	100.00	100.00	100.00	100.00	100.00
Costs	1.00	1.50	1.50	1.50	1.50
Total \$ out	101.00	101.50	101.50	102.25	103.50
MSR Mult	7.04	4.23	4.23	3.84	2.62
Servicing-Gfee	0.60	0.35	0.60	0.35	0.35
MSR value	4.22	1.48	2.54	1.34	0.92
Points/Credits	-0.375	1.000	0.000	-1.000	-3.125
FNMA 30 yr Bond	3.00	3.50	3.50	4.00	5.00
Bond price	97.53	100.89	100.89	103.80	107.69
Total \$ in	101.38	103.37	103.43	104.15	105.48
Profit(\$in-\$out)	0.38	1.87	1.93	1.90	1.98
Implied 0 point rate	3.750	4.000	4.250	4.500	5.500
Ratio of MSR to Profit	11.18	0.79	1.32	0.71	0.46
Net Cash for mortgage banker \$	(3.84)	\$ 0.39	\$ (0.61)	\$ 0.55	\$ 1.06
Real Profit Margins	\$ 0.38	\$ 2.25	\$ 2.30	\$ 2.30	\$ 2.43

- U.S. mortgage market is a “premium origination” model. This process is used to get the bond market to pay most or all of upfront costs & profit margin
- Assumes 1.5 points of origination costs
- Borrower 4 has no economic incentive to refinance, so those loans are not funded.
- Assumes 15bp Guaranty Fee
- MSR is capitalized difference between note rate and bond coupon, less Gfee
- Minimum retained MSR of 25bp
- MSR's are being capitalized significantly below where the IO market values the cash flows due to Basle III limitations on DTAs
- Historically, MSR's are valued a full multiple above equivalent IO strips because of ancillary income from servicing.
- Today, low valuations (75% of Agency IO's) placed on MSR's hide 1/2 point of profit.
- TBA/MSR multiple pricing as of 8/19/11 for November delivery:
 - o FN 3.0 @ 96.53 / IOS is 6.04x
 - o FN 3.5 @ 100.89/ IOS is 5.30x
 - o FN 4.0 @ 103.80/ IOS is 5.00x
 - o FN 4.5 @ 106.73/ IOS is 3.94x
 - o FN 5.0 @ 107.69/ IOS is 3.91x

Reduction in availability drives housing prices down



Refis went to the people who did not need help

FIGURE 21

High-Income Homeowners Were More than Twice as Likely as Low-Income Households to Refinance in 2008–9

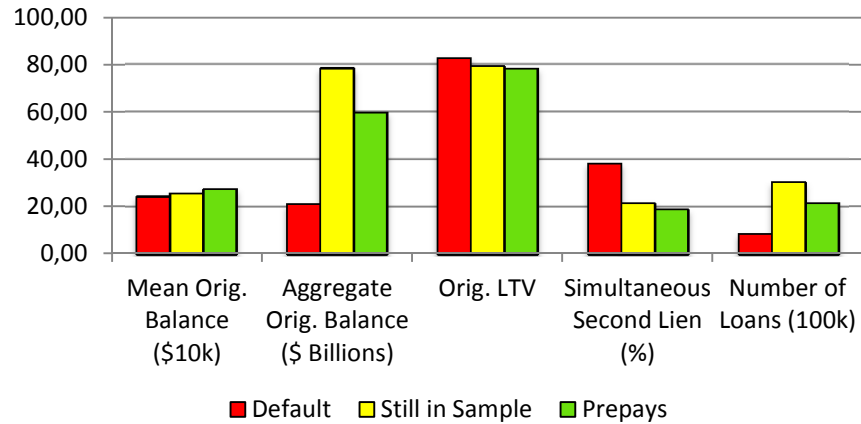
Share of Non-Mover Households with Mortgages that Refinanced (Percent)



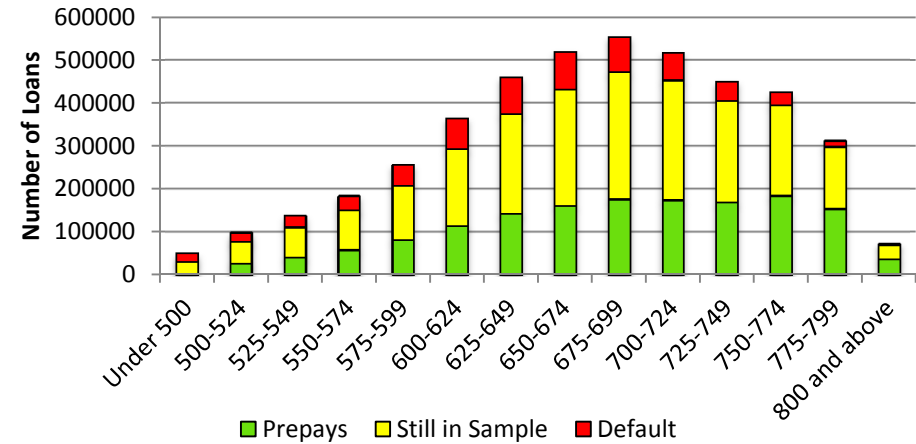
Source: JCHS tabulations of US Census Bureau, 2009 American Housing Survey, using JCHS-adjusted weights.

Outcomes for Loans Current in January 2007

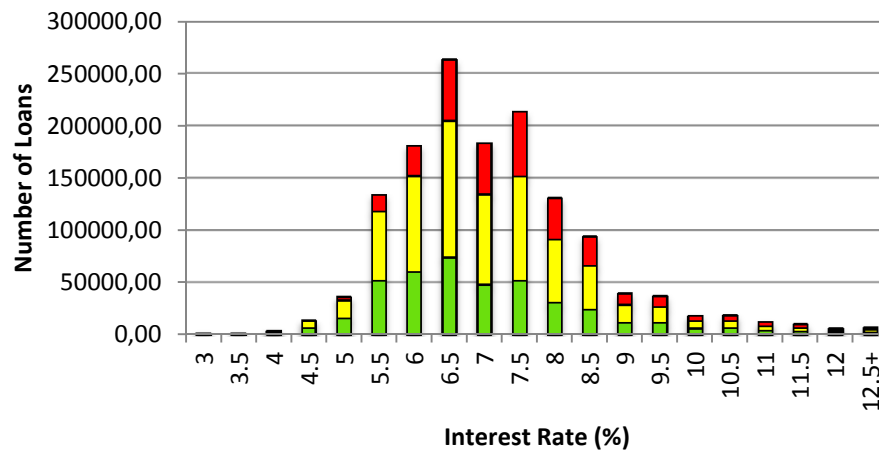
Summary Statistics



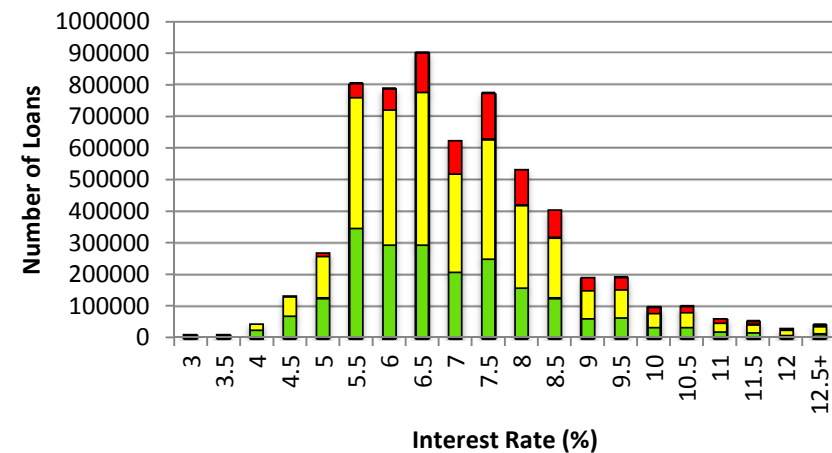
By FICO Score



By Int. Rate - Loans with Seconds



By Int. Rate - All Loans



Danish System: High Credit Quality

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- AAA ratings from Moodys, S&P
- There has never been a default
- Danish MCI's have implicit government backing through strong regulation by
 - Mortgage Credit Act
 - Danish Financial Supervisory Authority / Finanstilsynet
 - Danmarks Nationalbank
 - Denmark's title registration system
- Principle of balance keeps MCI's honest
- Late 80's housing collapse showed system's strengths
- Compares favorably to other European models
 - See Moody's May 2002 report
 - See MOW's September 2003 report
 - See BIS March 2004 Quarterly Review
- Danish system has been copied by Iceland, Norway and Mexico
- Absalon Project is now working with Ireland, UK, the Netherlands, Nigeria, Kenya, Peru, Korea, UAE and Poland

The “Best” Model for Mortgage Finance

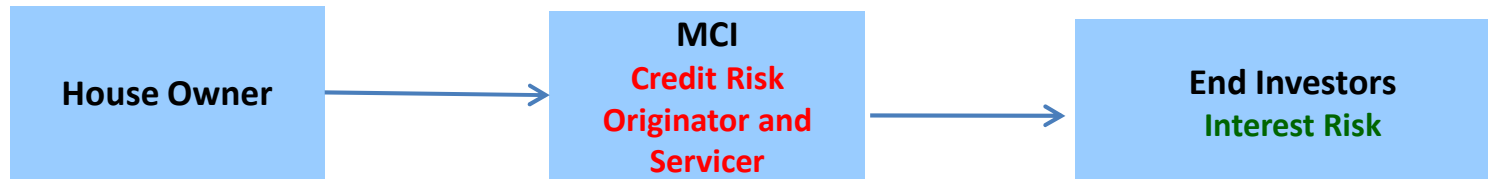
- Basle II risk capital guidelines
 - Article 22.4 of UCITS directive
 - Lowest risk capital weighting will rule the roost
- Central Bank “repo-ability” provides liquidity(see Fed and ECB)
- Consumers and bondholders will choose the winner
- Standardized and transparent loans and bonds = the best
- System should have macro economic stabilizers built in
- Extra Balance Sheets are unnecessary and a potential source of risk
- Deposit based systems are fraught with risks in volatile rate scenarios
- Inflexible Bond based systems do not scale up
- Other covered bond models are very inefficient structures (extra OC, see page 24)

US vs Danish MBS: Differences

- Transparency of loans to bonds and information search costs
- Regulatory and Ratings Issues
- Credit, Delinquency and Foreclosure Issues
- Externalities through linkage mechanism to Capital Markets
- Premium vs. Discount Origination
- Socialization of Credit Risk or Credit Availability
- Conflict of interest between bond holders and issuers/insurers
- Mortgage insurance through balance sheet or monoline providers
- Vertical integration or atomization of skills (separate origination, financing, securitization, trading, investing, servicing, master servicing and special servicing functions)

How the system could be fixed by emulating Denmark

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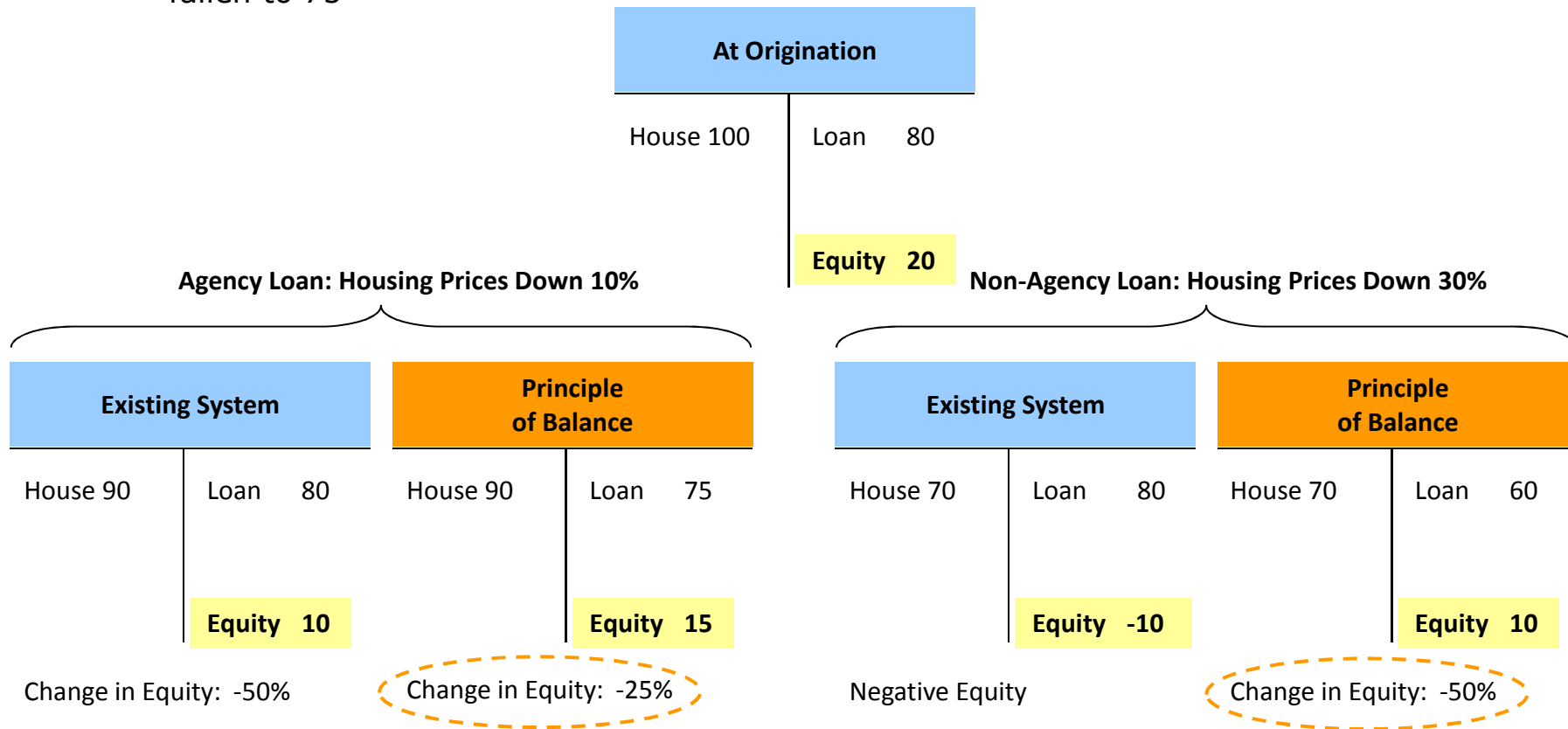


1. **Mortgage Credit Institutions (MCIs)** are required to retain credit risk and service the loans
 - Bond investors only retain interest risk rather than credit and interest risk
 - MCIs can participate on equal terms, subject to rigorous regulatory requirements
 - MCIs act as “liability advisors” to homeowners, seeking to put their customers into the lowest risk adjusted cost loans AND seeking to take advantage of temporary dislocations in the bond market that may allow for an NPV gain for the borrower
2. Mortgage is funded by the issuance of standardized bonds
 - Bond market deals with familiar and hedgeable risks: level of rates, slope and curvature of yield curve, interest rate volatility, financing and counterparty selection
3. Asymmetric nature of most mortgage systems is replaced by the Danish Principle of Balance

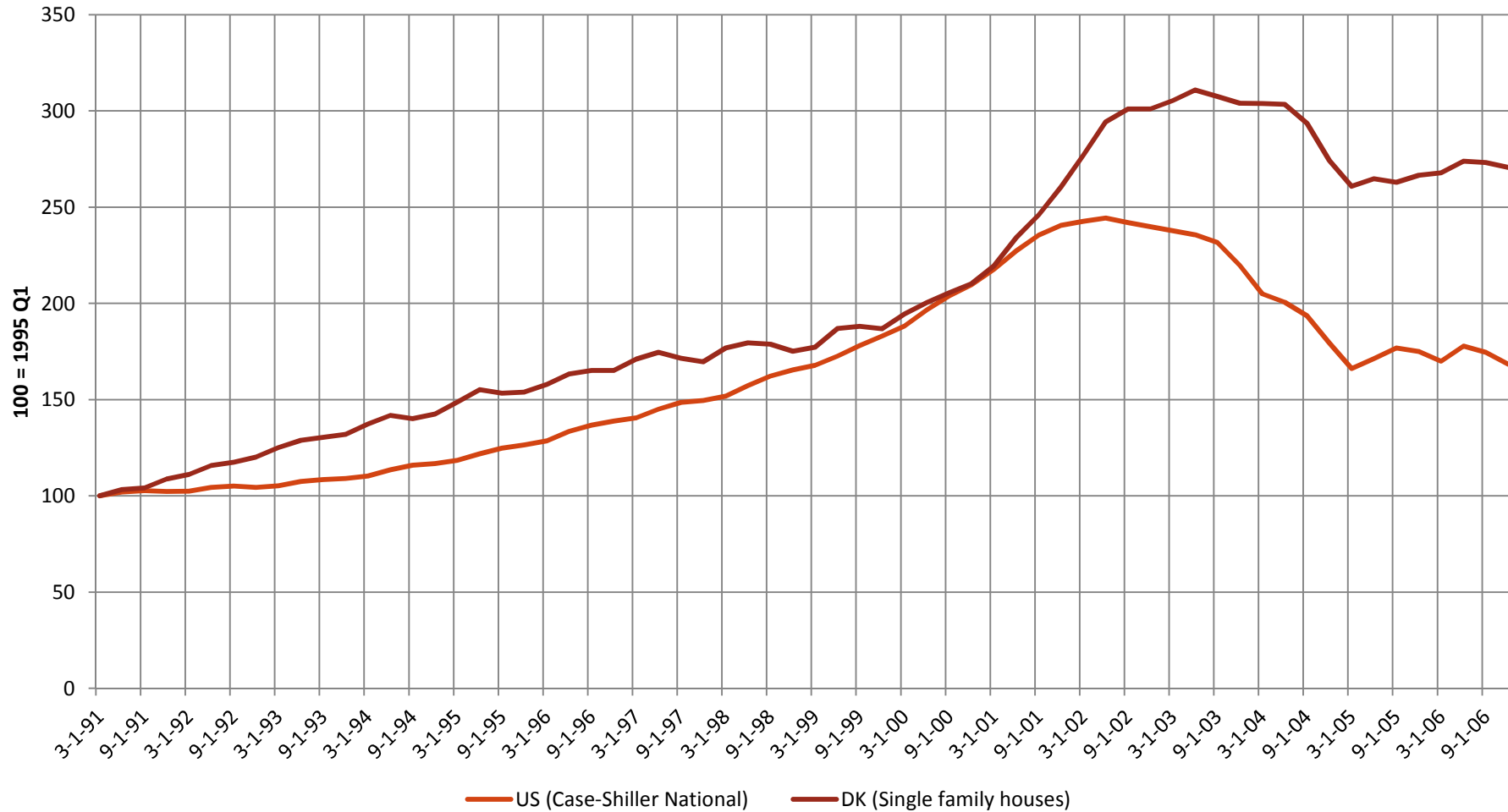
Principle of Balance: Borrowers can retire their mortgages by paying the lower of par or by purchasing the bond at the current market price

Choice of securitization model can reduce negative equity

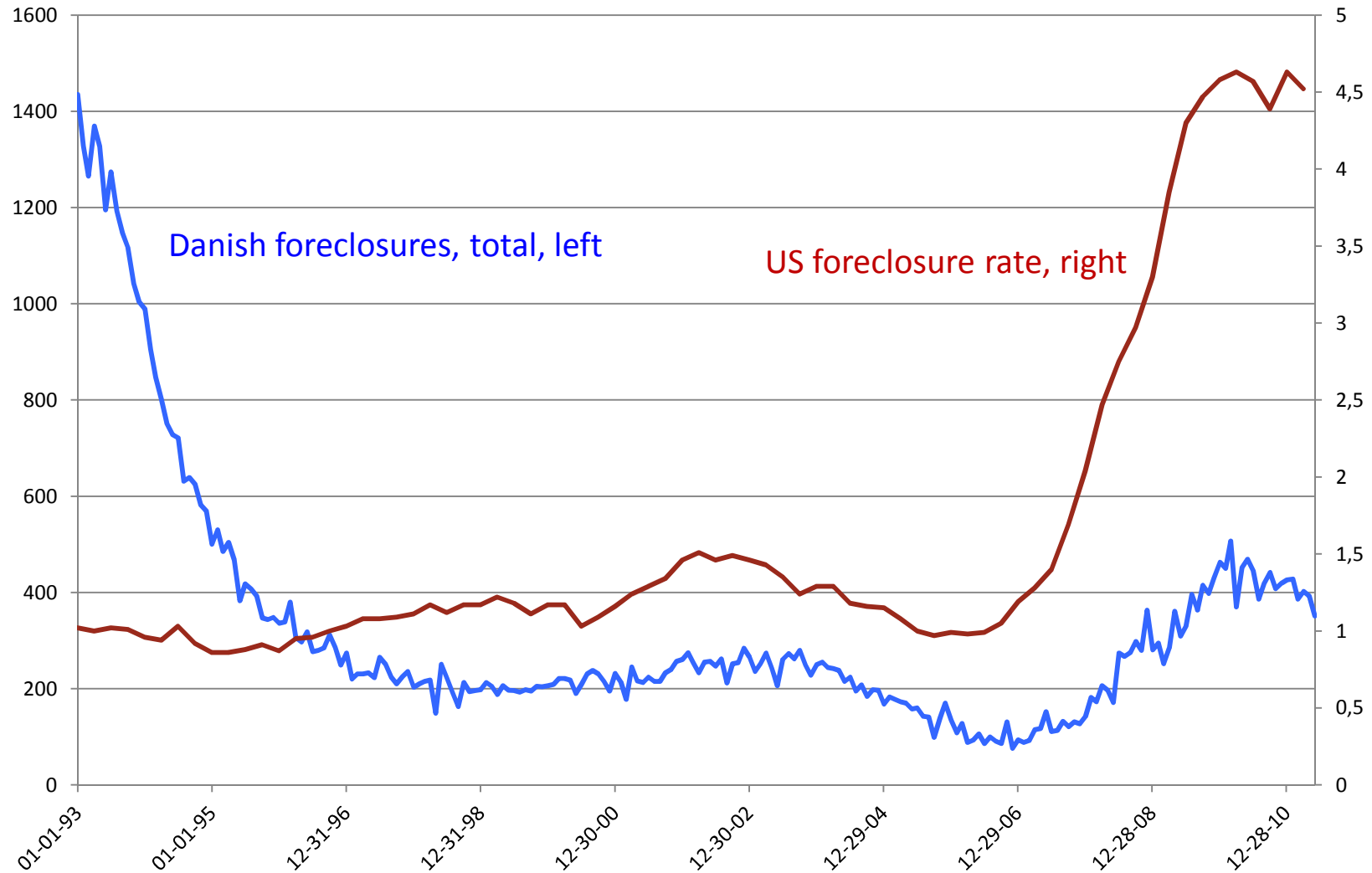
- Typical homeowner scenario:
 - Borrower pays \$100,000 for a house with an 80% LTV, loan originated at par
 - Agency Loan, housing prices have fallen 10% and FN 5% mortgage bond prices have fallen to 94
 - Non-Agency Loan, housing prices have fallen 30% and mortgage bond prices have fallen to 75



Denmark experienced a larger housing bubble...



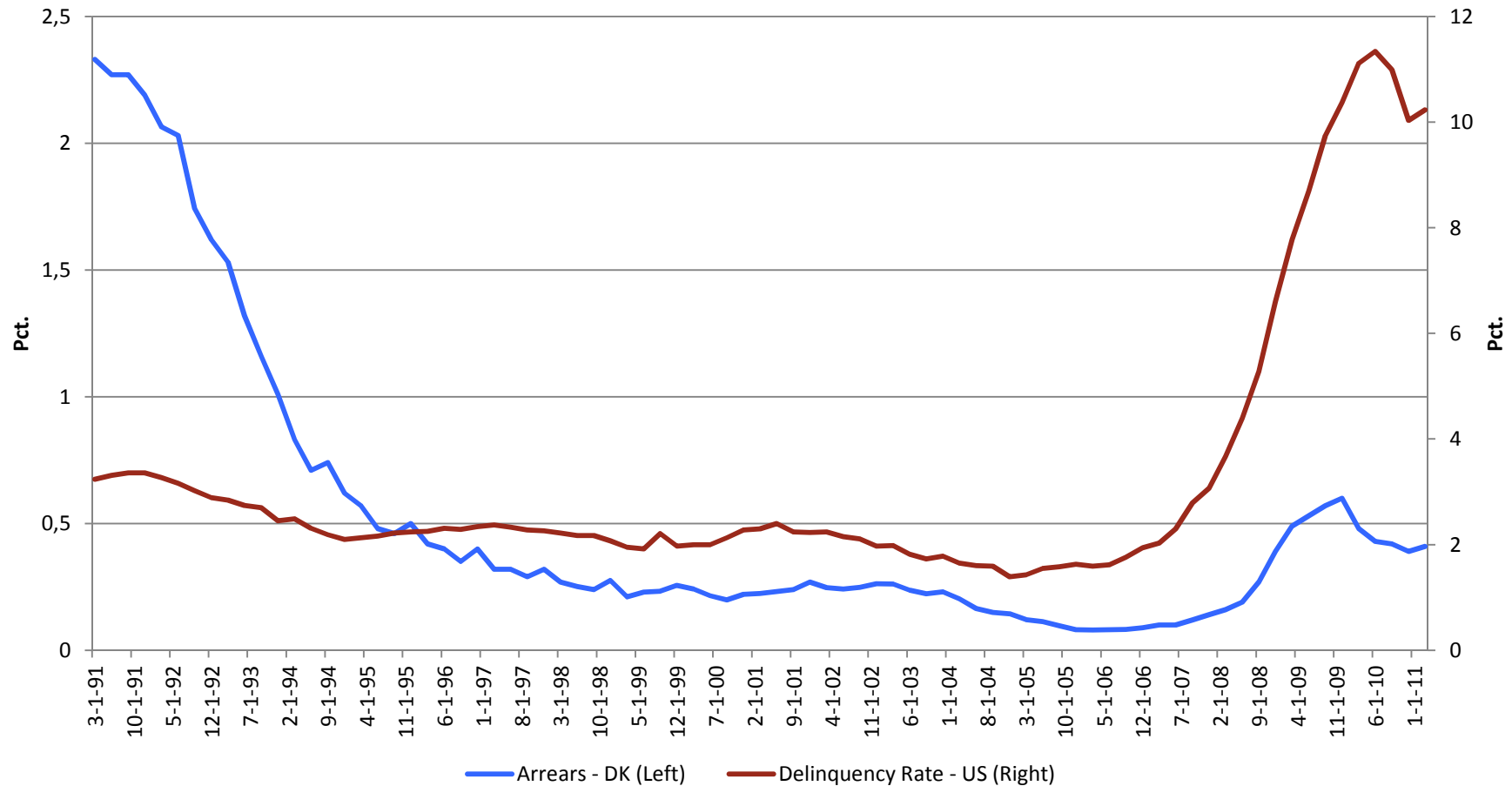
US experiences higher total foreclosure rates



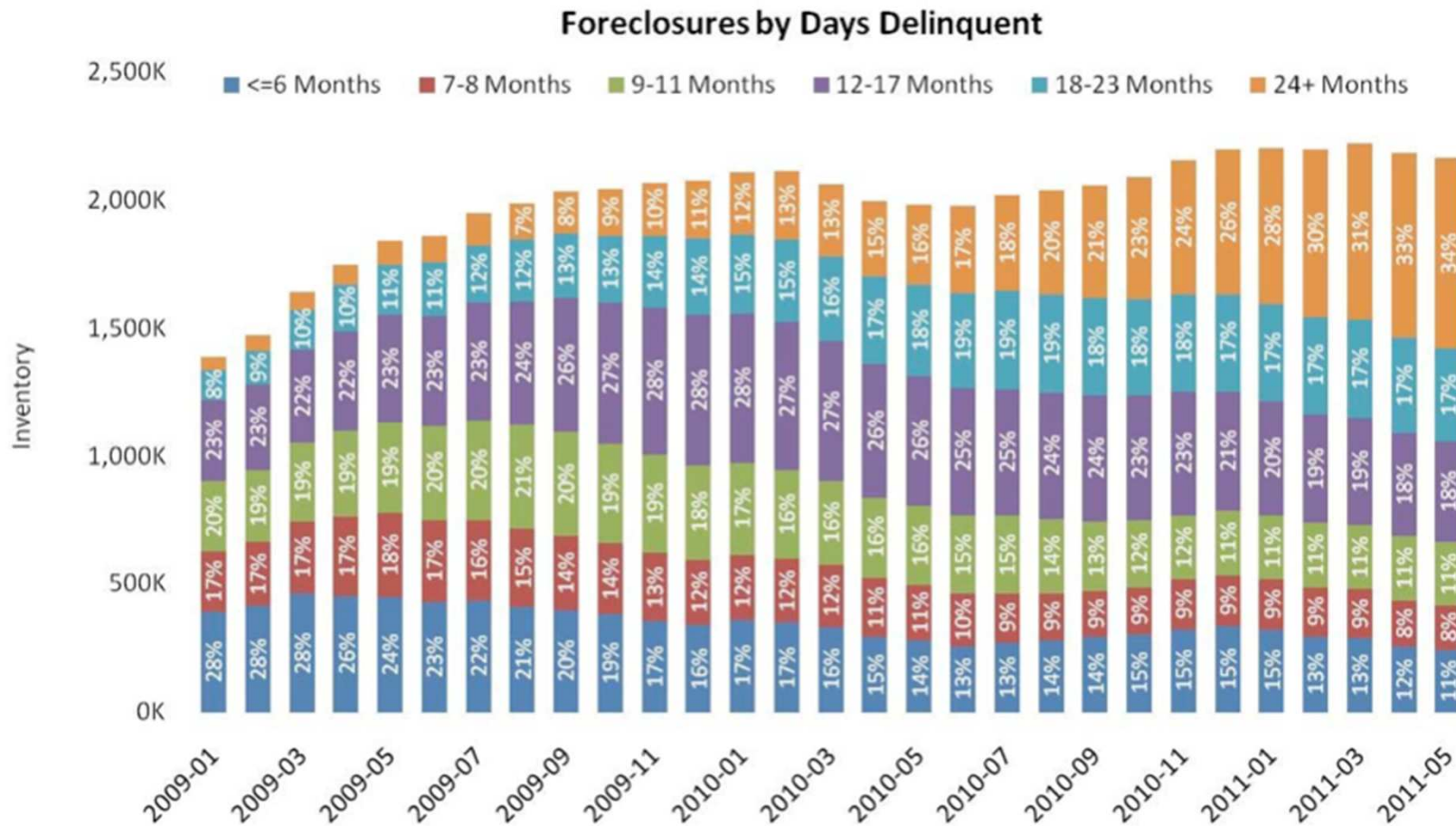
Loans in arrears – small in DK relative to US



Arrears and Delinquency Rates (DQ: all res. loans)

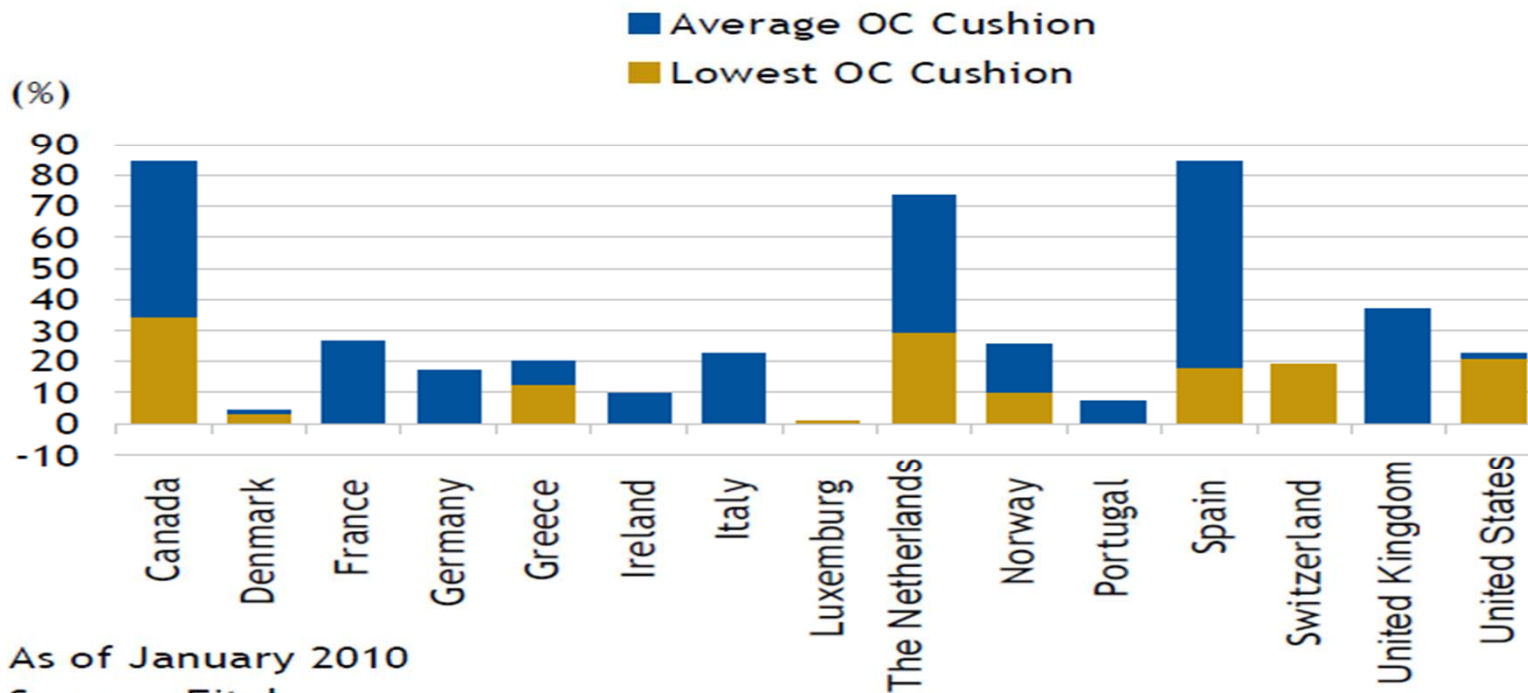


Long U.S. Delinquency Periods



Tight ALM results in lowest OC with highest ratings

Chart 3: OC Cushion by Country = Current OC - Supporting OC



As of January 2010
Source: Fitch

Fully transparent: real time information on each series

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Bonds Denmark

Search Danish bonds

Search: name/ISIN-code:

Bond type Benchmark bonds Mortgage credit and special institutions Government bonds Structured bonds Corporate and other bonds Forwards

Issuers

Coupon/Expiry

Interest rate type Fixed

Deferred amortisation Yes

Open / Closed Open

Name	ISIN	Coupon	B	Volume	Exp.	CCY
10DLR43.18	DK0006304035	10.00				
6BRF111.26	DK0009334575	6.00		227	2019-02-01	DKK
7NYK 03A.32	DK0009750010	7.00		109,041	2026-10-01	DKK
8NYK 3Cs26	DK0009726309	8.00		391,516	2032-07-01	DKK
6 D 23ds35	DK0009268765	6.00		4,654,792	2026-10-01	DKK
4 KBH13.14	DK0007200703	4.00		100,000	2033-07-01	DKK
6nyk03D 35	DK0009753386	6.00		20,000	2014-01-01	DKK
5NYK2C 19	DK0009745796	5.00		340,000	2033-07-01	DKK
5TK111Cs32	DK0004713807	5.00		173,899	2019-10-01	DKK
				1,687,692	2032-07-01	DKK

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Time series and transactions data

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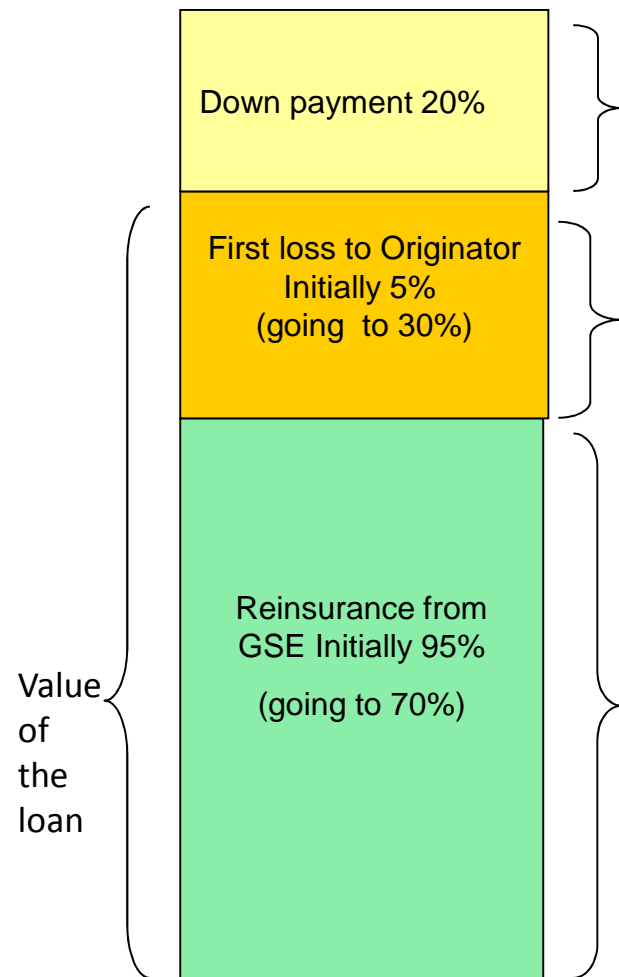
Last	Bid	High	97.080	Exchange Volume	262.583.230	Average price all trades	96.803
97.000	Ask	Low	96.725	Number of exchange trades	37		
▲ 0.23							

Price information for 2009-03-19	Price graph	12M graph
Open price	97.050	
Close price	96.775	
Average price exchange	96.851	
Average price all trades		
High	97.075	
Low	96.550	
Duration	10.57	
Yield	5.41	
Yield calculation price	96.798	
Exchange volume	38.539.243	
Number of exchange trades	40	Intraday 5d 1M 3M 6M 12M 24M

Historical price information

From

Credit Enhancement Structure for Risk Sharing



- Level 1: Quality Mortgage Loans
 - Minimum Down Payment, no second liens
 - Strict UW Standards and Appraisal Requirements
 - Full Recourse to borrower
- Level 2: Separately Capitalized Originator Insurance
 - Subordination based on extreme stress scenarios
 - Standardized structures
 - Non-rescindable insurance contract or subordinate bonds
 - Capitalized by valuable assets
 - Originator earns profits over time instead of booking it all upfront. Capital in SPV accrues in tax advantaged way.
 - Reps and Warranties hit this first , no debate, no delay
- Level 3: GSE Wrap
 - Bond holder looks to GSE for full faith and credit guaranty
 - GSE looks to Originator to remove bad loans from the pool
 - Originator purchases parri passu amount of bonds from pool at lower of market or par
 - If originator fails to perform, GSE can seize servicing rights and margin and reassign to another servicer
 - AAA rating flows from GSE reinsurance guarantee

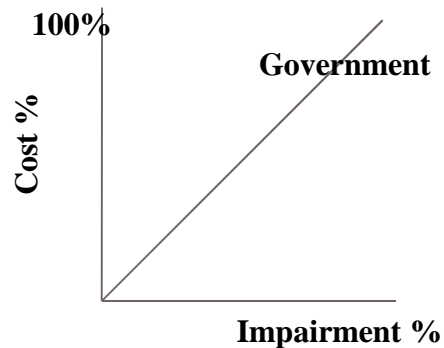
How to reduce taxpayer risk

- Current Legislation has GSEs reduce maximum loan size
 - This will crush HPI and increase taxpayer risk
- Better Structure: reduce risk over time by having lower inception levels for taxpayers.
 - Private sector takes more of the first loss every year.
 - GSE starts with bottom 95% of risk
 - Maximum inception point drops by 2-5% every year until it reaches 70% of loan value
- Loan size maximum should remain the same or even increase if the PLS market continues to fail to materialize.
- Expected Capital reserves in separate insurance SPV
 - 30% for first 5% loss / 1.5 points
 - 20% for first 10% loss / 2 points
 - 12% for first 30% loss / 3.6 points
- MSRs could be the collateral posted at the captive insurance SPV
 - Current tax accounting would fit nicely with this structure

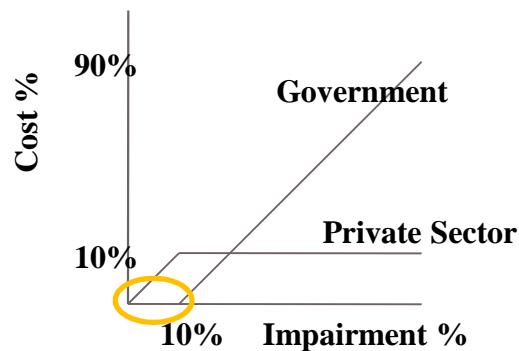
Traditional GSE Guarantee vs. Proposed Reinsurance

- Current programs ensure government shoulders all impairment costs (for 100% guaranteed projects) – or pro rata for a partial guarantee (none issued to date)
- Vast majority of impairments would be less than 10% - thus government needs minimal reserves to provide guarantee
- **Proposed structure could support much more mortgage lending than existing GSE guarantee programs or support the same amount with significantly less taxpayer risk**

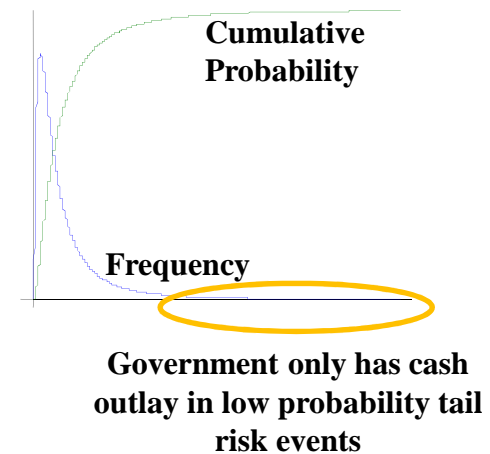
Current GSE Guarantee Program



Proposed Structure



Illustrative Outcome Distribution



What happens with no GSEs

1. Product Availability Lower

- 30 Year, fixed rate, callable mortgage will not exist
 - Insulates homeowners from business cycle
 - Allows homeowner to match duration of their largest asset and liability
- Refinancing is “starch” that helps the Federal Reserve to push the economy uphill
- 3-5 year ARMS with prepayment penalties will be the norm, putting more risk upon households
- Much larger TBTF banking system will be needed, with government support in another form

2. Level of Rates Higher

- Level of mortgage rates will be 100 to 250bp higher
- Volatility higher, spread history shows that purely private label MBS market had much more volatile rates

3. Costs to Society will be higher

- Taxpayer bailouts will be more expensive
- Homeownership will be lower
- Labor mobility will be lower, NAIRU will be higher
- Main monetary policy transmission mechanism will be diminished

Cost of Mortgages (ADCO)

	<u>Full Gov't</u>	<u>Equity Only</u>	<u>Mezz and Equity</u>	<u>Private</u>
Gov't Guarantee (5.00%)	100%	95%	95%	0%
Private Senior (5.50%)	0%	0%	0%	95%
Private Mezz (8.0%)	0%	0%	3%	3%
Equity (25%)	0%	5%	2%	2%
All in Cost	5.00%	6.00%	5.49%	5.97%
Stress Scenario	4.00%	6.33%	5.16%	8.01%

- This assumes perfect borrower (60 LTV/760 FICO, owner occupied)
- Imperfect borrower will be subject to private markets rate adds similar to existing agency market where LLPAs have eliminated 60% of existing, performing borrowers
- Purely private model will be very pro-cyclical in stress scenario
 - Gov't cash flows -100
 - Cost of equity doubles
 - Cost of Mezz increases 50%
 - Cost of PLS AAA rises 150bp
- Still must address structural issues
 - Servicing Standards
 - Transparency and reporting
 - Role of ratings agencies

Proposed Bond Structure: Tap Issuance



1. How it works

- Reverse the traditional process, first establish bond series then issue mortgages
- After the MCI underwrites and guarantees the creditworthiness of the borrower, the loans are funded by selling into the bond series
- Borrower receives proceeds from bond sale, thus establishing a direct link with the bond market and allowing for optional redemption in the future

2. Reduces Risks

- Warehouse and market risks are eliminated for MCI, allowing them to use their entire equity to guarantee credit risk
- Elimination of all interest rate risks leads to significant reduction in economic and operational capital under Basle II regulations

3. This is being done today at GNMA

- Ginnie II Jumbos are tap issue, multi-issuer pools
- Most successful product, investors and small issuers love them

4. The GSEs have done this before

- Freddie Mac Cash Series (old 16 and 17 prefix bonds) was quite successful
- Loans entering the cash window were priced at a daily auction
- Pools were open for tap issuance for one month
- Large, standardized, liquid bonds were created
- Main MBS issuance program in the 1980s
- Eliminated when FHLMC started running an opportunistic portfolio

Extension Risk of Mortgage Market

1. The implications of these low levels of refinancing activity at historically low mortgage rates is

- Extension risk in the mortgage market is vastly underestimated
- The LSAP has failed in its primary purpose, stimulating a refi wave
- The homeowners who need the most help, those with declining credit and home values, are the least likely to be able to refinance into a lower rate mortgage

2. The shape of the yield curve is the primary determinant of mortgage duration. Without taking into account slower than expected prepayments, the interest rate risk of the US mortgage market has doubled in the last three years

- Increasing slope of the yield curve
- Increased actual and implied volatility in the interest rate options market
- Dramatic decline in the amount and market share of ARMs

3. We are faced with the dark side of the conundrum, even though we now recognize the huge risks associated with callable/extendable mortgage cash flows, we are powerless to do anything about them.

- The increase in duration of the mortgage market in the last three years is triple the increase in interest rate risk due to the \$1.5 trillion US budget deficit in fiscal year 2009.
- A moderate increase in the level and slope of the yield curve in today's bond market can result in an overwhelming duration extension, a much larger threat to rising real interest rates than larger budget deficits and/or Chinese selling of reserves.

We should “get it right” before it is too late

1. There are many sources of pressure on long term interest rates

- Historic budget deficits (over \$1t) for many years
- Fear of FRB’s monetization of such debt and easy monetary policy
- Potential sale of foreign ownership of US debt instruments (\$10t)
- Enormous contingent duration embedded in the \$10.4t US mortgage system

2. The perfect opportunity exists to address the GSEs

- Mortgage rates are at all time lows allowing for excellent rate refinancing opportunity
- The US Government is the “single payer” for the mortgage market

3. Principle of Balance system allows for automatic de-levering

- As interest rates rise, the economic value of homeowners’ liability falls
- Homeowner’s are incentivized to redeem their existing loans at discounts, paying for this by issuing into new, smaller balance loans with higher coupons
- Face amount of debt is significantly reduced
- Weight of debt (calculated as Option Adjusted Duration) is significantly reduced

4. Waiting is not an option

- Moderate increases in the level and slope of interest rates can result in overwhelming duration extension, many multiples of the risk from large deficits or foreign selling
- US homeowners are already suffering from “lock-in” effects limiting labor mobility

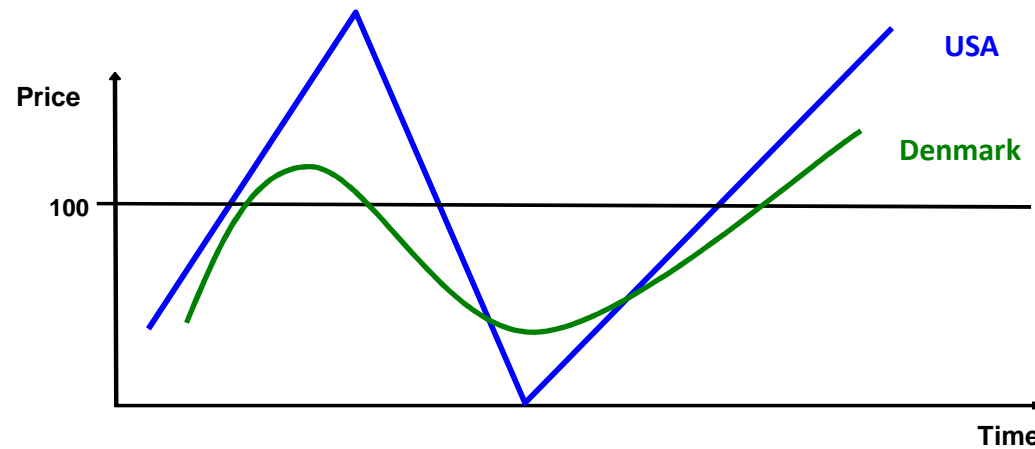
Mortgage Duration 102: weight is contingent upon inputs

	<u>% ARMs</u>	<u>FNCL OAD</u>	<u>Market Size</u>	<u>Total OAD</u>
September 1997	18%	5.0 est	\$3.72t	15.3t
September 1999	9%	5.0 est	\$4.35t	19.8t
September 2001	10%	4.33y	\$5.22t	20.3t
September 2003	12%	4.53y	\$6.68t	26.6t
September 2005	28%	3.61y	\$8.58t	22.3t
September 2006	30%	3.40y	\$9.69t	23.0t
March 2007	25%	3.86y	\$10.06t	29.1t
March 2008	19%	4.70y	\$10.61t	40.4t
March 2009	14%	5.04y	\$10.49t	45.5t
September 2009	12%	5.34y	\$10.38t	48.8t
September 2010	10%	5.70y	\$10.10t	51.8t

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- U.S. mortgage market is a “premium origination” model. This process is used to get the bond market to pay loan origination costs.
- Issuing callable bonds struck in the money results in very low OAD at times of loan origination
- The fluctuations in FNCL OAD are driven by the slope of the interest rate swap curve and implied duration
- Combination of migration to ARMs, a flatter curve and lower volatility masked the dramatic increase in the mortgage market after 2003
- Higher volatility and a steeper curve have driven FNCL OAD much higher in the last two years
- A significant switching from ARMs to FRMs has increased the duration of the market as well
- None of the increase in OAD comes from higher rates and/or slower prepayment speeds....YET!

Securitization choice can reduce interest rate volatility

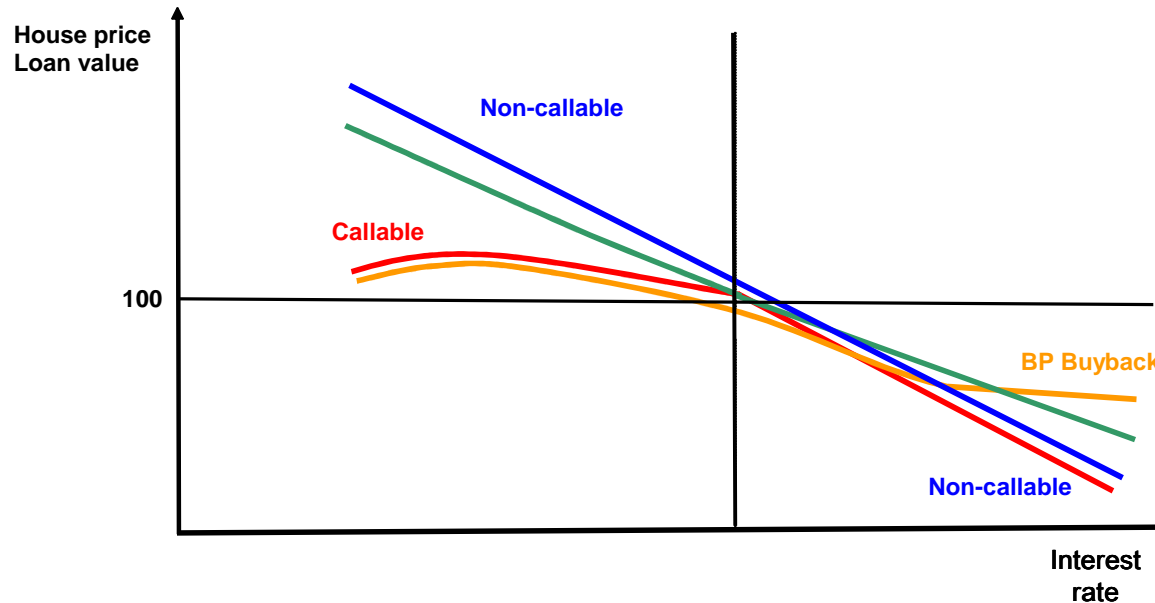


Option Adjusted Duration (Years)

	USA (orig. @ 101.6)			DK (orig. @ 98.9)		
	<u>5.5%</u>	<u>4.5%</u>	<u>3.5%</u>	<u>5%</u>	<u>4%</u>	<u>3%</u>
Rates – 100bp	---	(0.8)	3.6	---	.28	8
Spot	---	2.5	---	---	6.9	---
Rates +100bp	n/a	7.4	---	5.5	7.5	---

- U.S. mortgage market is a “premium origination” model. This opaque process is used to get the bond market to pay loan origination costs
- Callable loans are made with option struck in the money. This leads to the OAD “illusion” of very low durations of 30 year mortgages
- When interest rates rise, “contingent duration” appears and can be a multiple of original OAD
- No mechanism for the bond market to reduce systemic duration risk
- Danish model is a “discount origination” model
- Loans are priced transparently by bond issuance
- Mortgage banks compete with transparent origination, servicing and insurance charges
- Callable loans are made with option struck out of the money. Thus, 30 year mortgages have significant duration at issue
- When interest rates rise, the duration of the loans increases slightly
- Homeowners can take duration out of the system via optional redemption and refinancing a smaller balance into a higher coupon loan. Call option is re-struck at market rates

Securitization choice can improve negative convexity

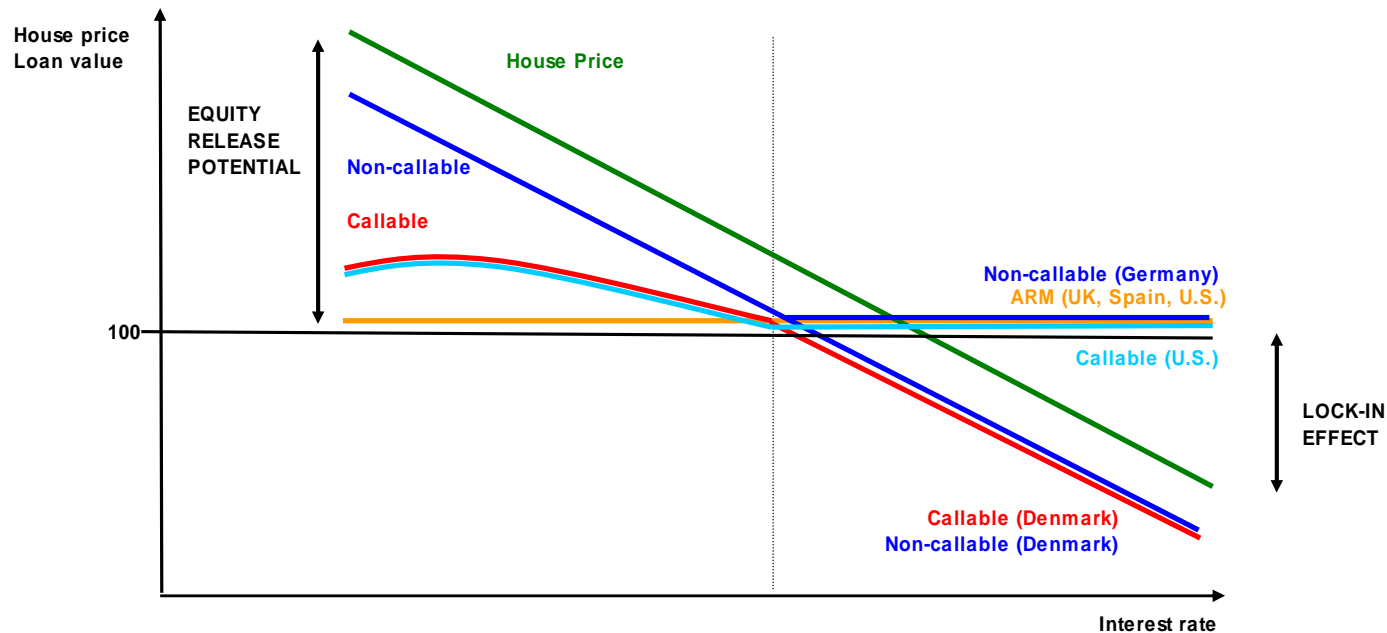


- Callable mortgage markets suffer from “convexity paradox” where each investor must hedge his own changes in OAD as well as worry about all the other investors trying to hedge changes in OAD. This becomes an exercise in game theory, as investors hedge to the expectation of other investors’ hedge activity
- Individual investors (and system) worry about change in partial durations (dP/dY) and the size of the error term at every point on the expected callable mortgage price/yield path vs. the original hedge duration
- Duration management tools (interest rate futures, swaps and options) are smaller than the mortgage market
- Asymmetric U.S. mortgage market results in significant duration extension when interest rates rise
- Danish mortgages allow for homeowner to exercise optional redemption when bonds trade at discounts. This smoothes the price path when rates rise. The mortgages trade with lower “empirical” duration. This allows for a lower “hedge duration” at loan origination AND smaller error terms at each point on the price/yield path

Swedish vs. Danish MBS

	Sweden	DK	SW-DK
Rates			
5 Year Government	2.66	2.82	-16
5 Year Swap	2.96	2.95	1
5 Year Mortgage Loan	3.84	3.41	43
5 Year Mortgage Bond	2.89	2.9	-1
Spreads			
Swaps - Government	30bp	13bp	17bp
Loan-Bond	87bp	51bp	36bp
Bond-Swap	-7bp	-5bp	-2bp
Ratings			
LTV Maximum	75%	80%	5%
Balance Principle	Cover Principle	Extreme Balance Principle	

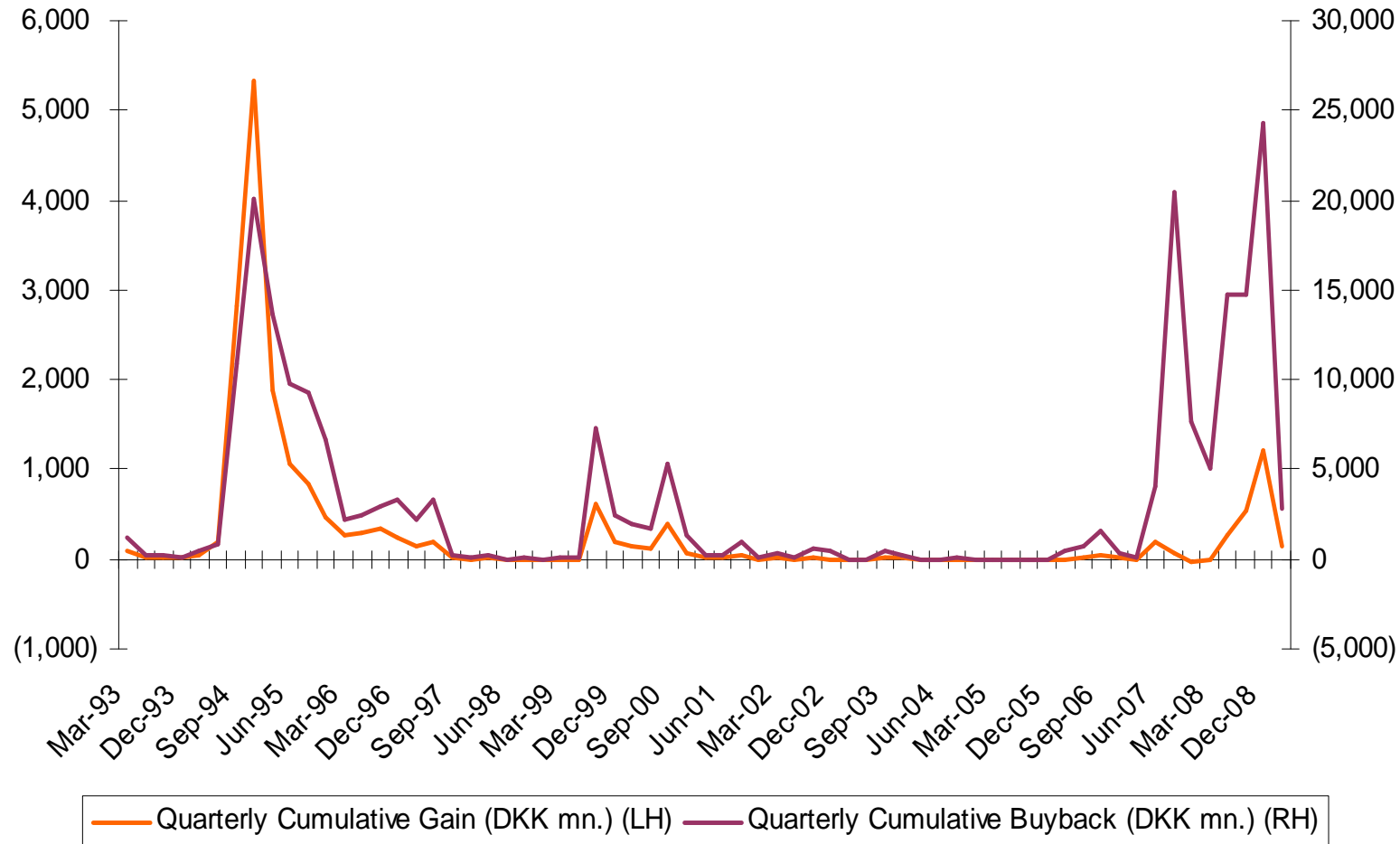
Summary of mortgage risk transfer systems



- **U.S. Mortgage Loans:** Can be called at par. However, due to non-standardized securitization, loans may not be redeemed at the market price when trading at a discount. This allows for equity release in event of lower rates, but subjects the borrower to the lock-in effect when rates rise
- All Adjustable Rate Mortgages are worth par in most interest rate scenarios. This implies that the borrower has no hedge against the interest rate sensitivity of home prices exposing him to more significant fluctuations of net home equity
- **Danish Mortgage Loans:** Can always be prepaid at par or redeemed by purchasing the bond at the market price
- **German Mortgage Loans:** Non-Callable at par: homeowners must instead pay a yield maintenance penalty equal to the NPV of the cash flows. When interest rates are higher, the loans are not redeemable at a discount. This is the worst of all possible risk transfer mechanisms

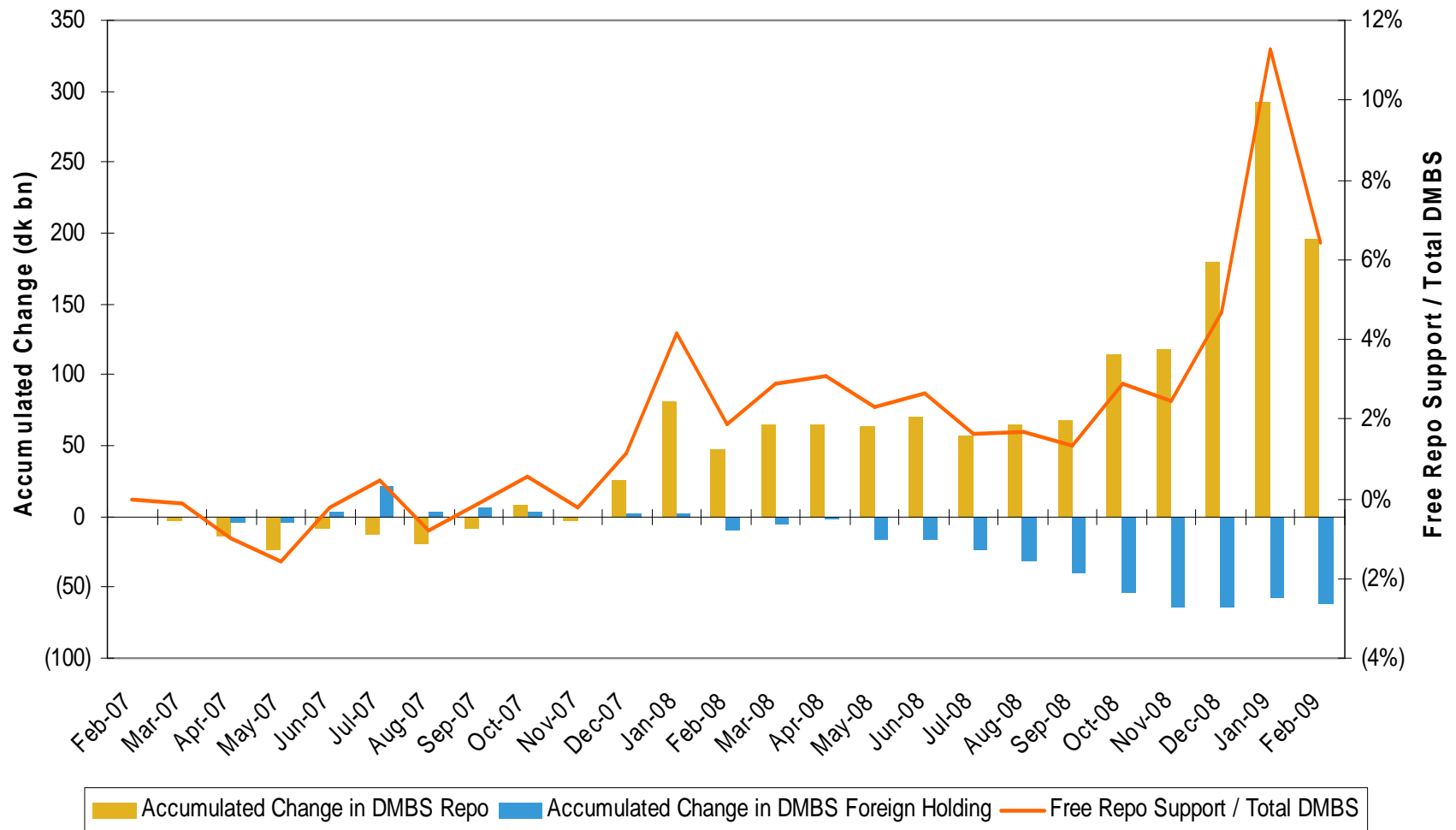
Alternative Redemption Increased to Stabilize Market

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Net Nationalbanken Repo of MBS has been Small

absalon project



Issues on Mortgage Servicing Rights

1. Mortgage Servicers are NOT organized or authorized to deal with systemic problems

- Trustee and Master Servicer get paid very small fees and do nothing
- Primary servicers are starved for funds on Day 1 given incentives to book profits in the quarter the loan is originated in the form of MSRs
- PSAs are not standardized and subject to significant interpretation risk

2. Mortgage Servicers have the wrong incentives

- Special servicers often have incentive to act in the interest of subordinate bond holders
- PSAs are idiosyncratic and require unanimous consent for servicer action
- Servicers are incentivized to do the wrong thing for the homeowner
 - Servicing advances are expensive and often not fully compensated
 - The write down of loan principal reduces servicing fees
- Second Liens are often serviced in a more rigorous fashion

3. Transparency and Reporting

- Servicers know the likely cash flows of the underlying loans 6 weeks before they are reported to the market. Bond market prices the interest rate risk and credit risk appropriately raising mortgage rates for everyone
- Homeowners get only one annual statement and no website to view escrow balances
 - See Jack Guttentag "Mr. Mortgage" website for extensive discussion

Mortgage Servicing Rights: What are they?

- Mortgage Servicing Rights (MSRs) can be described as
 - Present Value of Interest Only (IO) cash flow stream that exists between mortgage note rate and bond coupon, net of GSE guarantee fees and costs of servicing the loan
 - IOs are negatively convex, negative duration assets whose value is driven by
 - Positively correlated to moves in actual mortgage rates and the slope of the swap curve
 - Negatively correlated to moves in actual and implied interest rate volatility
 - Negatively correlated to house prices, financial innovation, mortgage banker competition
 - Costs of servicing is driven by costs of handling default, this has become significant
 - FHA servicers must advance the note rate while they are reimbursed at the "FHA debenture rate"
 - MSRs are a "tax deferred asset" and a "non-cash asset"
 - Federal and state tax authorities finance MSRs at 0% interest rate until the cash flows are realized
 - Remaining balance (1-combind tax rate) must be financed on B/S with non-secured funding
 - MSR historically marked higher than agency IOs to reflect chance to capture new MSR upon refi, P&I escrows, T&I escrows, late fees and expand customer relationship
- MSRs are the best hedge for a large financial institution
 - Only significant negative duration asset, which can help balance tendency for banks duration risk
 - Negative duration equivalent of \$750b FN5s
 - Only significant asset to perform better when household credit conditions deteriorate
 - Voluntary prepayments are significantly reduced when FICOs fall and LTVs rise
 - Current prepayments are 25% of modeled speeds, indicative of sensitivity to HPI and RU
 - MSRs hedge benefits scale up for the financial system as a whole, unlike CDS in which every winner is matched to an equal and opposite degree by a loser

Mortgage Servicing Rights: Mark to Historical Herd?

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- MSR asset is marked to market on a quarterly basis along with the associated hedges
 - big banks (70% of MSR today) run an “echo system with no biodiversity”
 - Concentration of MSR asset makes it easy for big banks to copy each other in
 - Prepayment modeling
 - Hedging of rate, curve, basis and volatility risk
 - Creates “abnormal demand “ for CMM swaps as CMM is the main model assumption that drives refinancing incentive and prepayments
 - The required yield is linked to the weighted average cost of capital
- Pro-cyclical “regulation” of mark to market process exacerbates tendency to mis-value and mis-hedge
 - OCC does quarterly survey of top 20 mortgage servicers who report on standardized form
 - MSR mults (capitalization multiples) by loan type
 - MSR hedge ratios (in 10yr equivalents) by loan type
 - Price Waterhouse does a mid-quarter survey of the top 10 mortgage servicers who report
 - Intent on where next quarter end MSR mults will be moving, net of hedges
 - Changes in other servicing inputs (costs of advances, labor, unexpected hedging expense)
 - In combination with Analysts, the two surveys provide incentive for servicers to try to guess where everyone else will mark to market their MSR assets at quarter end. Like the mythical Keynesian beauty contest, each participant attempts to pick the number in the middle of the distribution, not the right valuation
- End result is that each big bank is forced to mark to market by adjusting their marks to be at or below the middle of the “herd” as defined by the last OCC quarter-end survey. In a falling rate environment, this leads to significant undervaluation of MSRs and provides accounting cover to understating true profit margins by a up to a point.

Mortgage Servicing Rights: Pro-Cyclical Regulation

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- Regulation of MSR has significant, unintended and poorly understood consequences
 - FRB limits MSR to no more than 75% of a regulated financial institution's Tier I capital
 - Drives small loan originators to sell their loans "servicing released" to TBTF banks TPO channels
 - Now servicers have zero connection to borrower, making future loan problem resolution hard
 - Small banks lose their only natural interest rate hedge
 - Medium sized mortgage originators are faced with "sell or grow" business choice, with organic growth causing regulatory problems. Drove large mortgage originating banks into thrift charters
 - FRB did NOT create a special financing program for servicing advances, most private sector lenders have tried to minimize financing to mortgage servicers, forcing even more small and medium sized originators to sell loans servicing released
 - All bank regulators view MSR and MSR growth as a necessary evil, something to be minimized
 - Basle III proposes to limit MSR to 10% of Tier 1 capital, MSR plus DTAs to 15%,
 - Pushing MSR out of regulated financial institutions into unregulated companies.
 - Driving down retained servicing and reducing existing "skin-in-the-game"
- Financial analysts do not understand MSR, MSR hedging and MSR accounting
 - Analysts are afraid of what they do not understand
 - Designation as a Level 3 asset raises investor sensitivity
 - Anecdotes of large blowups in MSR hedging are widely advertised and not easily forgotten
 - 29 year bull market in bonds has reinforced analyst myopia
 - Positive duration has been a source of profits while unhedged negative duration has been a source of loss.....lets extrapolate that forever!
 - Reporting is opaque, making it hard for analysts to discern proper hedging

Proposals on MSR and Servicer Guidelines

1. Promote benefits of Mortgage Servicing Rights

- Eliminate regulatory limits on scale of holdings, push back on Basle III
- Encourage retention of MSRs as way to reduce interest rate risk and hedge credit risk
- Eliminate “gain on sale” accounting treatment, require income to be earned over time

2. Publish Regulatory “Safe Harbor” rules to guide servicer behavior

- Address conflict of interest between servicer and holder of subordinate liens
 - Require servicer to purchase first lien from securitization before making any efforts to collect on second lien that they may own and service
 - Require prompt action on delinquent loans, to minimize the negative carry associated with advances (89 days with no workouts to avoid the rule)
 - Take appropriate action to preserve value for the senior bond holders
- Require real time (daily) reporting to both bondholders and homeowners

3. Strong and specific legislation to support the of a covered bond market

- Covered bonds address interest alignment issues which vex current MSR issues
- Requires language on how FDIC treats covered bonds in event of issuer insolvency
- Strict limits on types and quality of underlying cover pool collateral: only first lien residential and multifamily mortgages with conservative LTVs
- Strict limits on asset/liability mismatches, in recognition that such mismatches were highly associated with insolvency among European covered bond issuers

This is a unique opportunity
to “get it right”

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- 1. The GSEs should be transformed into mortgage guarantee vehicles only**
 - Fannie/Freddie should be merged and eventually the portfolios should be run off
 - Frannie Mac should establish a Principle of Balance (PoB) guarantor program
- 2. Credit risk allocation to be shared between originator and federal guarantor**
 - Originator should retain 10% first loss risk position
 - Margin between loan rate and bond should NOT be capitalized, instead earned over time
- 3. Borrower gets a market rate based on transparent bond pricing**
 - Bonds market should price the interest rate risk for borrowers
 - Bonds are tap issued on a daily basis
 - Loan is cancelable at the lower of the market price or par – the Principle of Balance
 - New loans will have full recourse, enforced at the Federal level
- 4. Financial regulators should be empowered to:**
 - Remove bad loans, bad brokers and bad borrowers from the system
 - Raise capital and reporting requirements as deemed necessary
 - Lower LTV ratios and/or raise credit scores as deemed necessary
 - Raise margins for borrowers if ex post credit costs prove to be higher than expected
- 5. Eliminate restrictions on investor owned properties**
 - Unrestricted GSE guarantees to professional property investor mortgages
 - Loans should carry maximum LTV of 70%
 - Borrower should be underwritten to their experience as a landlord and property manager

Lowering interest rates, reducing negative equity

1. Lower interest rates through new or expanded government guarantee programs

- Super streamlined refinance should waive all requirements except one -- the borrower must be current on their existing mortgage, no appraisal required.
- The GSEs should not be charging additional fees for loans they already guarantee.
- The GSEs should refinance current non-agency loans at reduced fees.
- Loan size limit should be \$729,750, going up to 130% of this limit in high cost areas.

2. Consider modifying mortgages so that homeowners have at least 5% positive equity in their homes at current valuations based on an Automated Valuation Model (AVM).

- The conversion of mortgages could be systemic, enforced on the owners of MBS and loans
- Servicing companies would be fully indemnified via safe harbor rule
- Second mortgages would face loss of lien status and risk full loss of principal.
- The losses from the write-down of principal would be borne by the bond holders.
- These losses should be treated as full tax credits, accounted for as a Treasury Strip
- The tax credits should be non-transferable.

3. As a matter of equity, homeowners with written-down mortgages would be subject to higher taxes

- Principal reduction will count against taxpayer's \$500,000 exemption from capital gains
- Reduction of capital gain exemption will last for 20 years and apply to the gain from the sale of any residential real estate, not just the home associated with the principal reduction
- Avoids adverse selection of shared appreciation schemes
- Borrower must agree to full recourse on new, lower balance loan

Counter-cyclical Proposals

1. Require FHFA to direct GSEs to use all tools available

- Eliminate LLPAs for the refinance of ALL loans currently guaranteed by the GSEs
- Eliminate the 25bp “Adverse Market Fee”
- Eliminate appraisal requirement and paperwork as part of a new “Super-Streamlined” refinance program
- Requirements: being current on existing mortgage and being alive

2. GSEs should implement new securitization program: Principle of Balance

- Enable pooling which allows for optional redemption
- Provide guidance on future information disclosure requirements
- Discourage the ex-post opportunistic practice of culling through loan production to find loans that display preferred prepayment characteristics
- Encourage originator/securitizers to retain some “skin in the game” via significantly reduced G-fees

3. Promote benefits of Mortgage Servicing Rights

- Eliminate regulatory limits on scale of holdings (see Appendix)
- Encourage retention of MSR as way to reduce interest rate risk and hedge credit risk
- Eliminate “gain on sale” accounting treatment, require income to be accrued

Some more proposals

1. **Align the GSEs interests with those of society**

- Simplify and limit the size of financial businesses, starting with the GSEs
 - Eliminate portfolio, hand management of existing portfolio to professionals
 - Focus on using full faith and credit guarantee to stimulate a standardized, transparent interest aligned mortgage market
- Return to counter-cyclical credit reserving process

2. **Reduce risk weighting of GSE MBS and debt**

- Relatively painless way to signal support without consolidation on Federal B/S
- Consistent with reduction of risk weight of TLGP paper from 20% to 0% in October

3. **Systemic Crisis backstop “MBS buyer of last resort” should be FRB/Treasury**

- Require purchase of GSE guaranteed MBS in event of Financial Crisis
- Counter-cyclical and automatic, outside of legislative/regulatory fiat
- Acknowledge that GSE portfolios were pro-cyclical accelerants

4. **Strong and specific legislation to support the of a covered bond market**

- Clear language on how FDIC treats covered bonds in event of issuer insolvency
- Strict limits on types and quality of underlying cover pool collateral: only first lien residential and multifamily mortgages with conservative LTVs
- Strict limits on asset/liability mismatches, in recognition that such mismatches were highly associated with insolvency among European covered bond issuers