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# **MSRs and Alternative Redemption Mortgages: Significant Counter Cyclical Forces**

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Alan L. Boyce

## Extension Risk of Mortgage Market

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- 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**

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## **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**

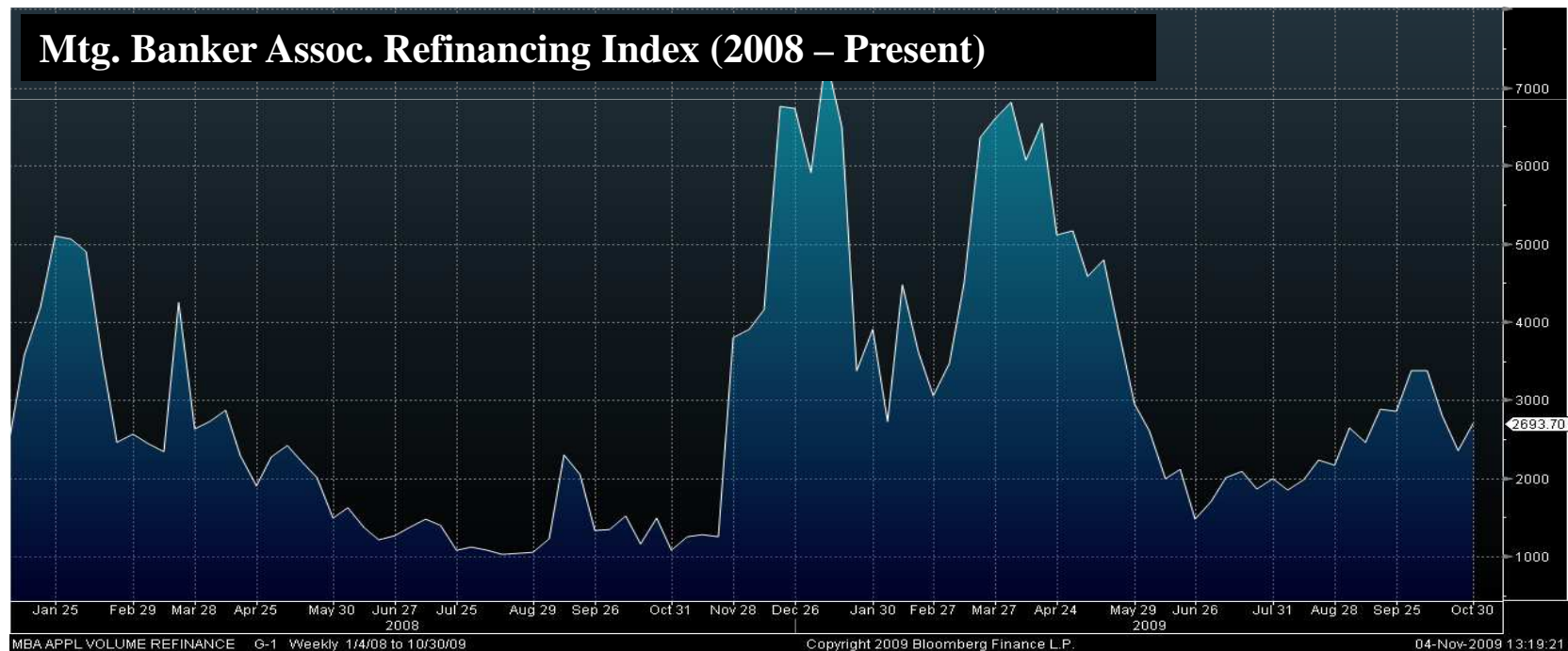
- As interest rates rise, the economic value of homeowners’ liability falls
- Homeowner’s are incentivized to redeem their existing loans at discounts, paying for this by issuing into new, smaller balance loans with higher coupons
- Face amount of debt is significantly reduced
- Weight of debt (calculated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

## Refinancing Wave Has Yet To Materialize

- Federal Purchase Program was designed to make credit more affordable for homebuyers. There was a hope that there would be another refinancing wave.
- A wave of refinancing applications at the end of 2008/early 2009 was unfulfilled, prepayments did not rise
- Despite very low mortgage rates driven by the LSAP, refinancing applications have tailed off sharply.
- This is a warning sign for the future and will impact future OAD calculations
  - S-curves must be recalculated, increasing sensitivity to equity position of homeowner
  - Current speeds are running at 25% of modeled speeds



## The Dog That Didn't Bark: The GSEs defeat the LSAP

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- At current mortgage rates, prepayment speeds should be 60 CPR, instead they are 15%
- GSE's are trying to recapitalize themselves while in "conservatorship"
  - Higher "G-fees", tighter standards
  - Every loan has ¼ point Adverse Market Delivery Charge (AMDC)
  - Loan Level Pricing Adjustments (LLPAs) are charged for low FICO, high LTV, property type, mortgage type
  - Most borrowers who are current on a GSE guaranteed loan face 3 points of LLPA fees
- Mortgage banking is highly concentrated and uncompetitive (55% in top 3 originators)
  - Profit margins have dramatically increased
  - Mortgage Servicing Rights are being undervalued
  - Big servicers are being super conservative in response to aggressive loan putbacks under Reps and Warrants contract clauses
  - No expansion of staff to deal with surge in demand for refinancing
- Headline 30 year rate is not the actual mortgage rate that borrowers receive
  - Actual mortgage rates to actual borrowers are 50 to 200 basis points higher
- Loan workouts under the Making Homes Affordable Act are thwarted by combination of
  - Predatory mortgage pricing laws prevent loan modifications from being made, rates higher than 150bp over the survey rate are not allowed
  - Homeowners who need a loan adjustment attract lots of LLPAs

# Mortgage pricing 101

AMDC	0.00	0.25	0.25	0.25	0.25
LLPAs	0.00	0.00	0.00	2.00	3.00
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	101.75	101.75	103.75	104.75
MSR Mult	6.50	5.00	4.00	3.00	2.00
servicing	0.35	0.35	0.35	0.35	0.35
MSR value	2.28	1.75	1.40	1.05	0.70
Points	0.00	2.00	0.00	0.38	0.38
Bond	FN3.5	FN4	FN4.5	FN5	FN5.5
Bond price	99.31	102.03	104.19	106.06	107.25
Total \$ in	101.59	105.78	105.59	107.49	108.33
Profit(\$in-\$out)	0.59	4.03	3.84	3.74	3.58
Implied 0 point rate	4.0	4.5	5.0	5.5	6.0

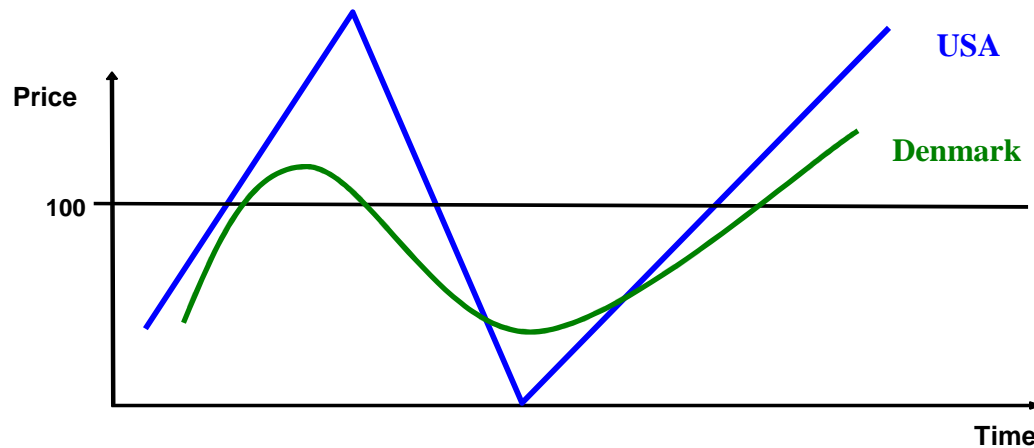
- U.S. mortgage market is a “premium origination” model. This process is used to get the bond market to pay most or all of upfront costs and profit margin
- Assumes 1.5 points of origination costs
- Adverse market fee of \$0.25, refundable for very high FICO/very low LTV borrowers
- Wells Fargo is running a 1 point, 4.5% loan program for its best borrowers (750/75)
- Assumes 15bp Guaranty Fee, MSR is capitalized difference between note rate and bond coupon. Note that MSRs are being capitalized significantly below where the IO market values the cash flows, thus hiding another ¼ point of profit margin.
- TBA/MSR multiple pricing as of 8/6/10 for October:
  - FN 3.5@ 99.3125/IOX is 6.50
  - FN 4.0@ 102.03125/5.0
  - FN 4.5 @ 104.1875/4.0
  - FN 5.0 @ 106.0625/3.00
  - FN 5.5 @ 107.25/2.14
- “Current Coupon” mortgage rate is 4.13

## 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	\$9.67t	23.0t
March 2007	25%	3.86y	\$10.25t	29.7t
March 2008	19%	4.70y	\$10.55t	40.2t
March 2009	14%	5.04y	\$10.43t	45.2t
September 2009	12%	5.34y	\$10.34t	48.6t

- 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



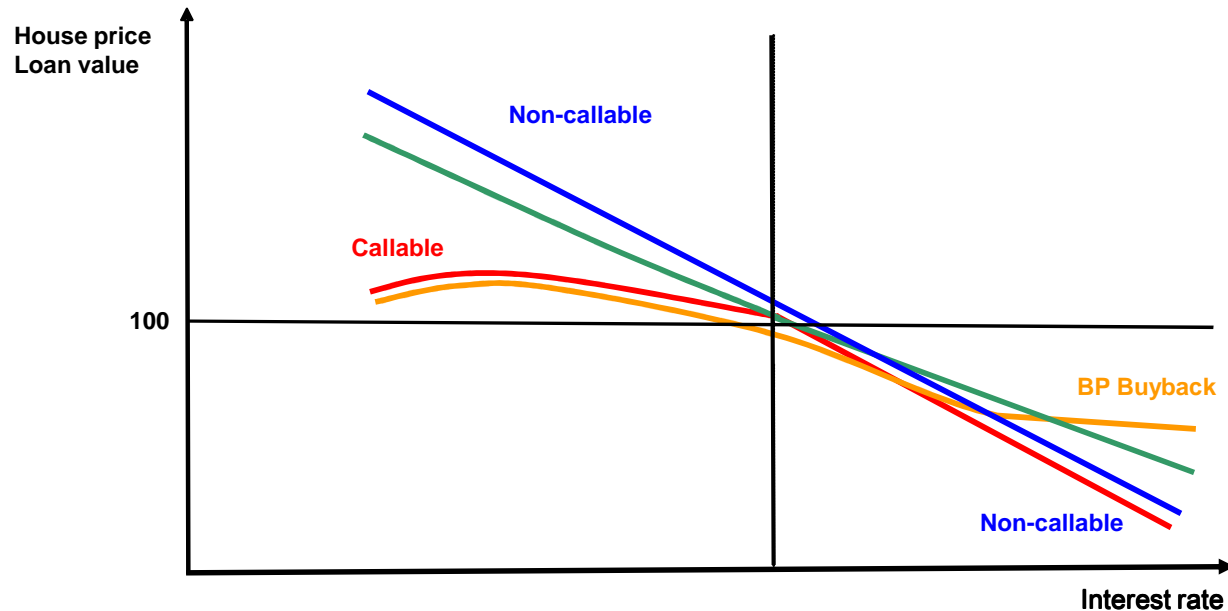
- U.S. mortgage market is a “premium origination” model. This opaque process is used to get the bond market to pay loan origination costs
- Callable loans are made with option struck in the money. This leads to the OAD “illusion” of very low durations of 30 year mortgages
- When interest rates rise, “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

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	---

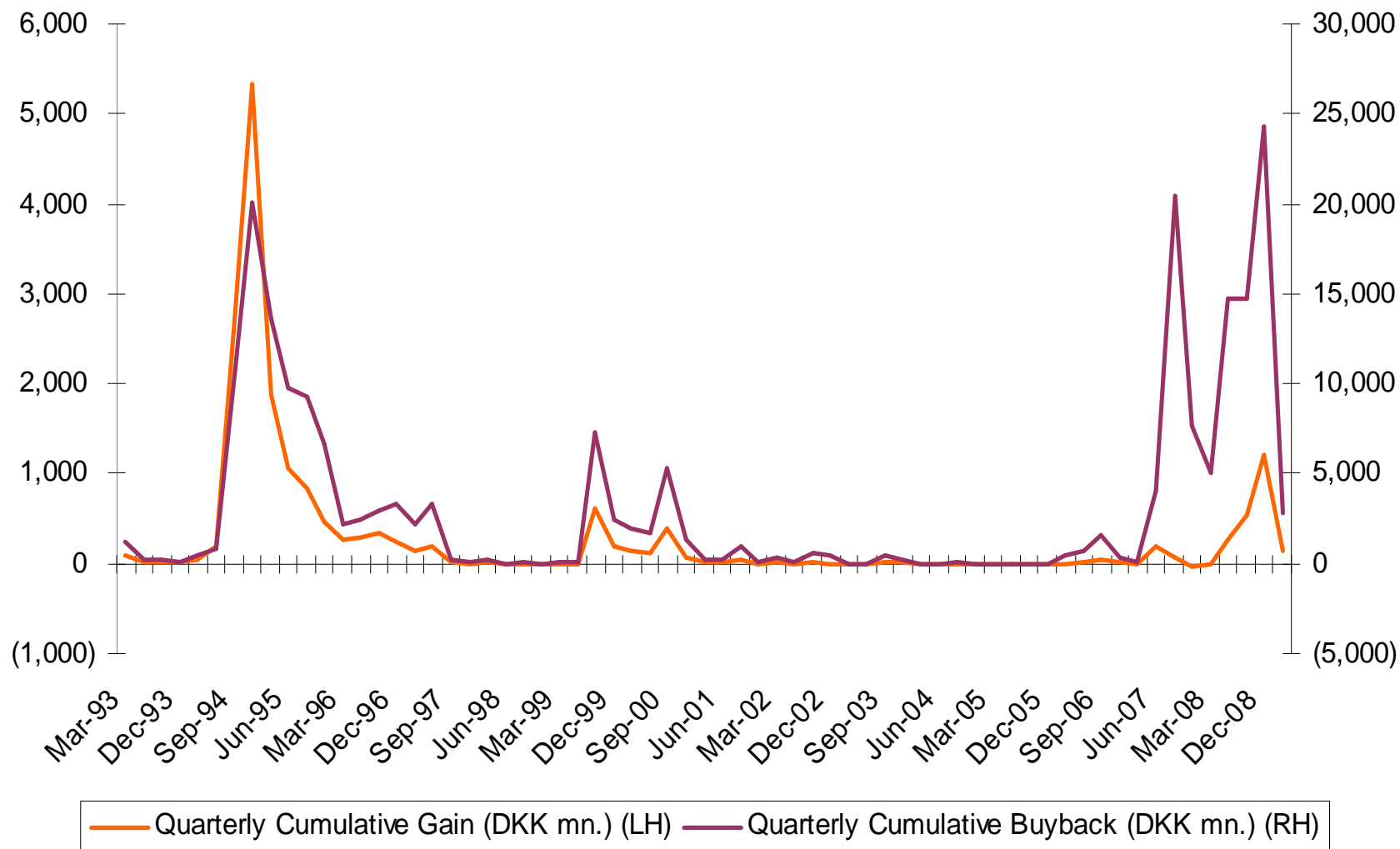


## Securitization choice can improve negative convexity



- 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

# Alternative Redemption Increased to Stabilize Market



# Mortgage Servicing Rights: What are they?

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- 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
- 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
  - TBTF banks (70% of MSRs today) run an “echo system with no biodiversity”
  - Concentration of MSR asset makes it easy for TBTF 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
- 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 TBTF 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 point.

# Mortgage Servicing Rights: Pro-Cyclical Regulation

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- Regulation of MSRs has significant, unintended and poorly understood consequences
  - FRB limits MSRs 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
    - Drives large mortgage originating banks into National bank/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 MSRs and MSR growth as a necessary evil, something to be minimized
- Financial analysts do not understand MSRs, 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 (Homeside/NAB, Long Beach/Wamu, LASER, Capstead) and not easily forgotten
  - 28 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 experienced mortgage traders to discern proper hedging

# Counter-cyclical Proposals

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## 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

## 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**

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### **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

### **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