How to Fix the U.S. Mortgage Market

Discussion Draft

Absalon

Introduction

- We are in the midst of the bursting of several related bubbles, including the "super bubble" that encompassed the entire international financial system. The epicenter of the crisis is the complex and poorly financed US housing market
- Key and related issues that need to be addressed include:
  - Minimizing foreclosures
  - Maintaining mortgage finance availability
  - Minimizing the likelihood that home prices will "over-correct" and go too low
  - Reducing the negative macroeconomic impacts of the decline of home values
  - Reducing the negative impact of existing mortgage backed securitizations and derivative financial products on the financial system
- Comprehensive mortgage reform is required, with three key elements:
  1. **Reducing interest rates for all mortgage borrowers**
  2. **Directly lowering the number of homes with negative equity**
  3. **Introducing a new mortgage system that properly aligns incentives – the Danish Model**

Background

- Many problems led to the current situation, including
  - Systematic poor underwriting of credit risk due to improper incentives and poor accounting rules (e,g., originators often not "on the hook" for any portion of credit risk)
  - GSE business model based on positive returns accruing to the private sector with downside risk held by the government (*heads we win, tails you lose*)
  - Excessive demand for poorly designed MBSs and CDOs as part of the financial bubble; lax evaluation of the underlying risks in these securitizations by the ratings agencies
  - A pure real estate bubble, driven by low interest rates
- The old system is, however, gone
  - Over 90% new mortgages in past six months government guaranteed
  - Fannie and Freddie in conservatorship
- Comprehensive reform faces complex obstacles
  - Worsening economic fundamentals greatly exacerbate foreclosures and home price drops
  - Tranche warfare between different owners of mortgage backed securities and ensuing uncertain legal liabilities impede workouts of troubled loans
  - It is difficult to simultaneously reduce the number of homeowners with negative equity, meet standards of fairness, and provide sound incentives for homeowners
  - Repetitive practical difficulties of timing and scale bedevil all proposals; regulators are multiple, overlapping and uncoordinated

A successful mortgage reform

1. **Lowers mortgage interest rates**
   - Key to preventing overshooting on price
   - Needs to be available to full range of borrowers, not just high FICO, low loan-to-value borrowers that currently qualify for agency mortgages
2. **Limits unnecessary foreclosures by reducing number of homes with negative equity**
   - Negative equity must be addressed – there is no other way to limit foreclosures or to avoid excessively low prices for years to come
   - Policies must address issues of fairness and homeowners who have no realistic way to afford current home
   - Must be done at scale, promptly
3. **Puts the system moving forward on a sound basis with well-aligned incentives**. **Cleanly separates credit risk and interest risk**
   - Advisors to homeowners (brokers and mortgage bankers) should evaluate and share credit risk – *can this person afford this home*?
   - Bond-holders should manage interest rate risk over time – *what happens when interest rates rise or fall, the yield curve changes, or volatility increases or decreases*?

Much can be done immediately through GSEs

– Expand eligibility and allow for higher LTV loans

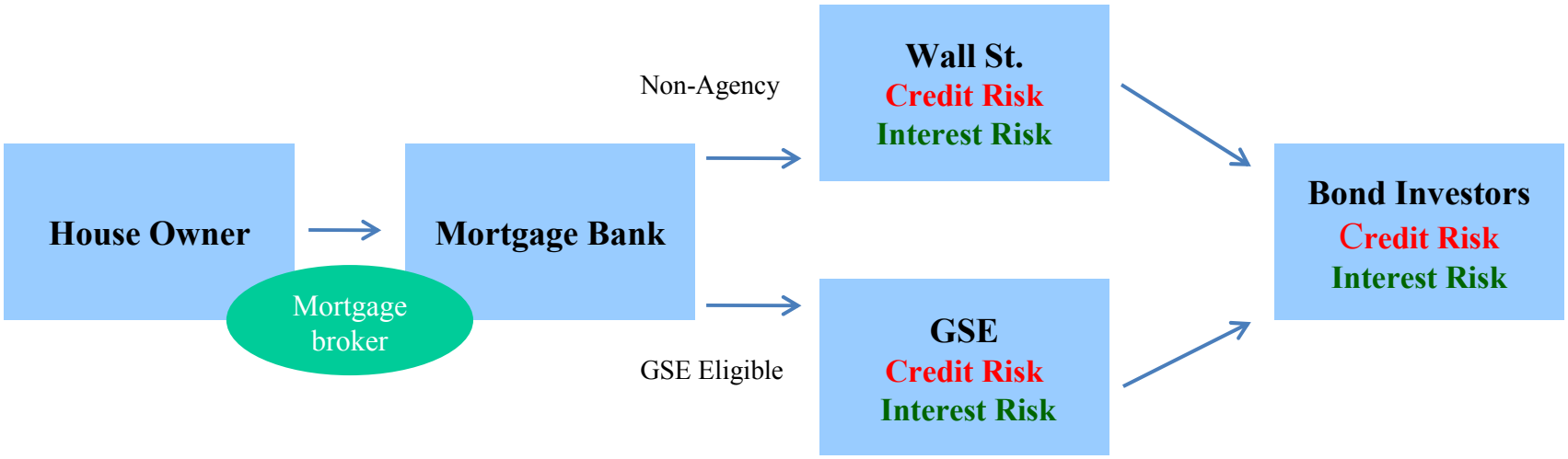
- Increase maximum conventional loan limit (requires legislation)

- Reduce pooling and guarantee fees

- Reduce mortgage insurance requirements (requires legislation)

– Allow for super-streamlined refi's for mortgages that are currently guaranteed, so as not to face current lack of capacity in mortgage credit industry

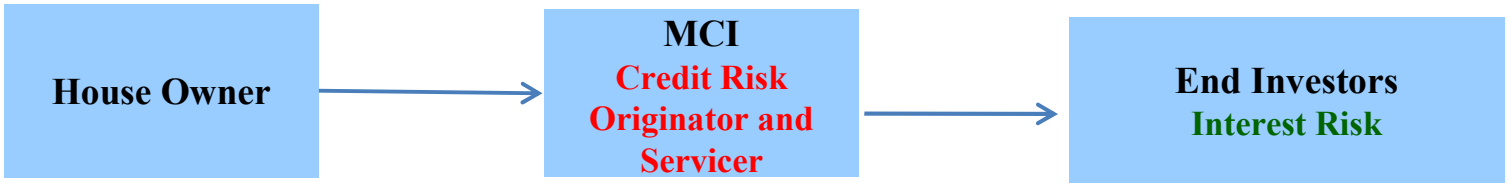
Rebuilding the system to properly align incentives: The old system needs to be replaced



As discussed above, the old system was flawed in many ways and needs to be rebuilt

-- to separate credit risk and interest risk in origination and securitization
-- to minimize the likelihood of negative equity and ensuing foreclosure
-- to stabilize the market (avoid overshooting on price)

How the System Could Be Fixed By Emulating Danish System



- How is this system different?
  - **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
  - Mortgage is funded by the issuance of standardized bonds, creating a large and liquid market
  - Bond market deals with familiar and hedge-able risks: level of rates, slope and curvature of yield curve, interest rate volatility, financing and counterparty selection
  - Asymmetric nature of American mortgages 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

Current system is not symmetrical or balanced

If interest rates decline

- Home prices go up
- Homeowner **can prepay existing mortgage** by refinancing at new lower rate
- Allows for equity withdrawal

If interest rates rise

- Home prices go down
- Value of the mortgage (in a MBS) drops to the holder of the mortgage
- Even though the value of the mortgage has dropped, the homeowner still owes "par" – the face value of the mortgage. **He cannot prepay existing mortgage at the price the mortgage is selling for in the market**
- ~$5 trillion is currently owed by homeowners of non-agency mortgages. These mortgages are valued by the market at $3.5 trillion.

The Danish System: refinancing on the way down

If interest rates decline

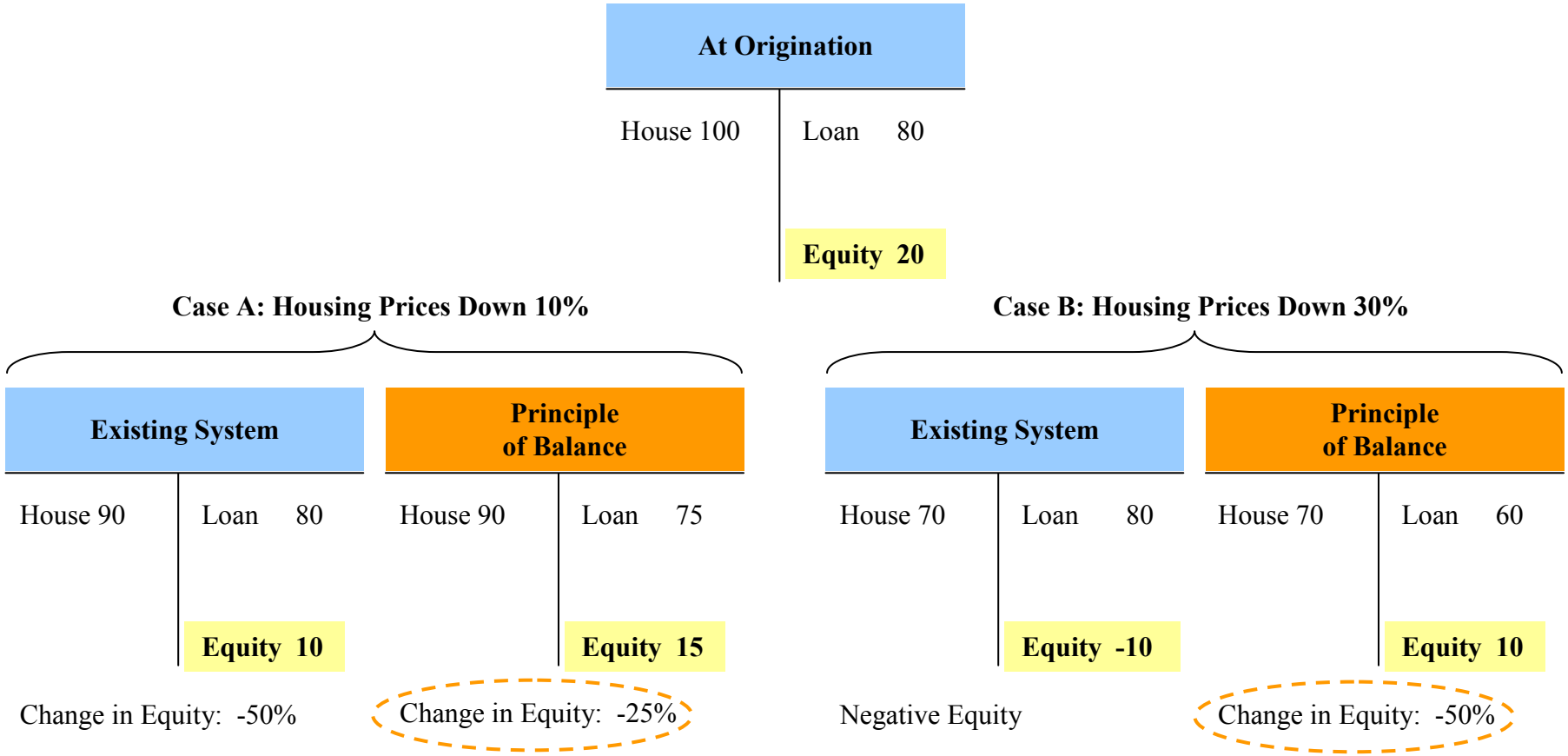
- Home prices go up
- Homeowner **can prepay existing mortgage** by refinancing at new lower rate
- Allows for equity withdrawal

If interest rates increase

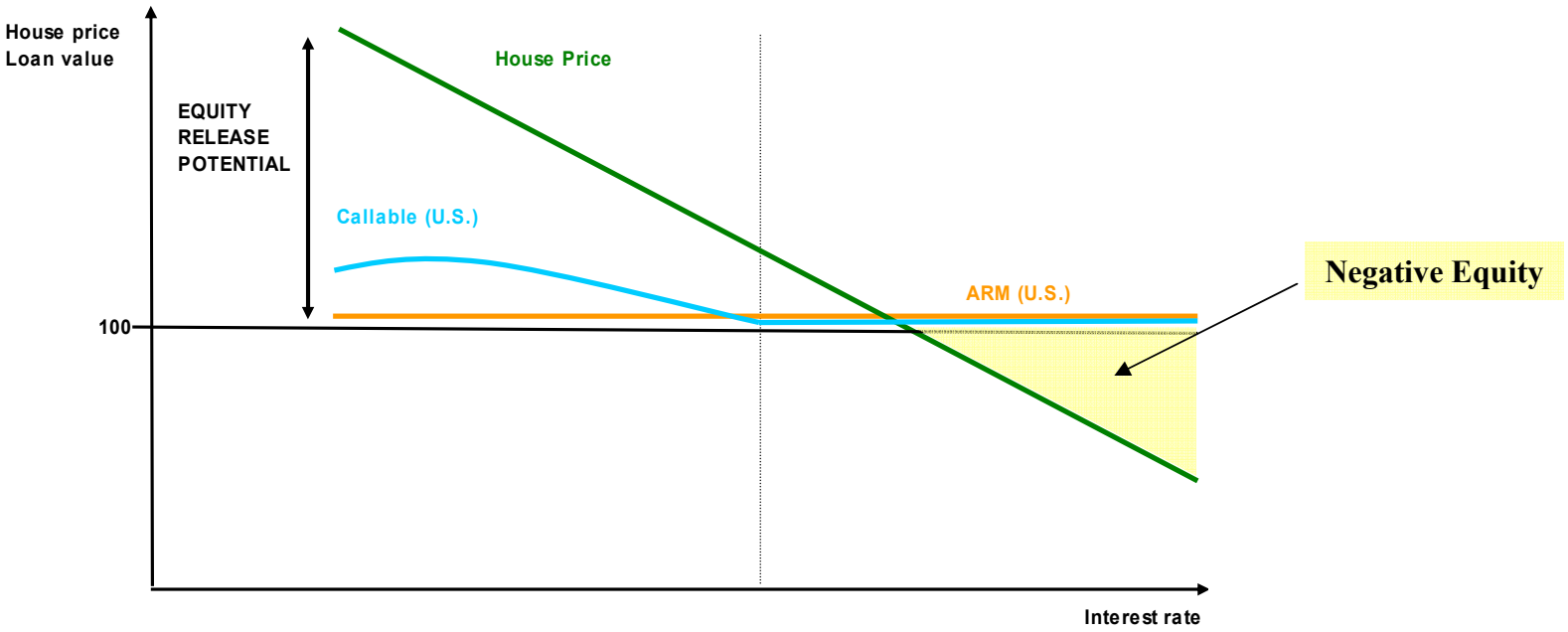
- Home prices go down
- Value of the mortgage (in a MBS) drops to the holder of the mortgage
- Assuming credit worthiness, a homeowner **can prepay** by purchasing back his or her mortgage at the current discounted price
- This maintains equity in the home
- The key is new, standardized mortgage pools

Which Reduces Risk of Negative Equity

- Typical homeowner scenario:
  - Borrower pays $100,000 for a house with an 80% LTV, loan originated at par
  - In Case A, housing prices have fallen 10% and mortgage bond prices have fallen to 94
  - In Case B, housing prices have fallen 30% and mortgage bond prices have fallen to 75

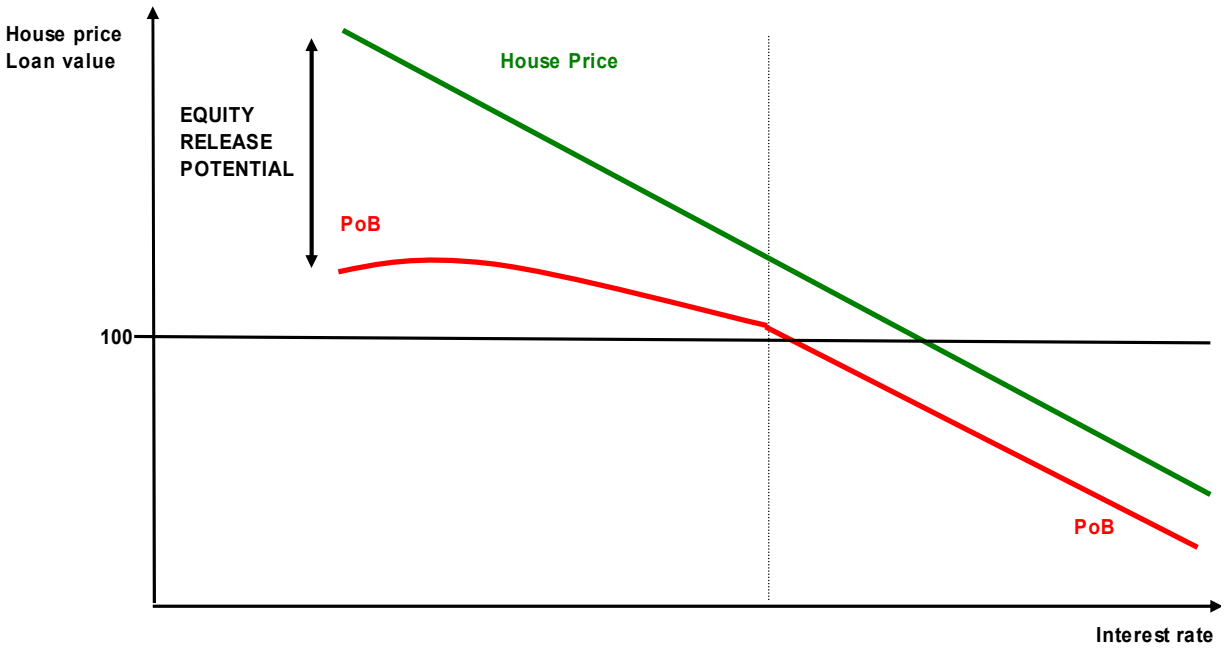


U.S. Mortgage Structures Can Create Negative Equity



- **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 potential negative equity 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

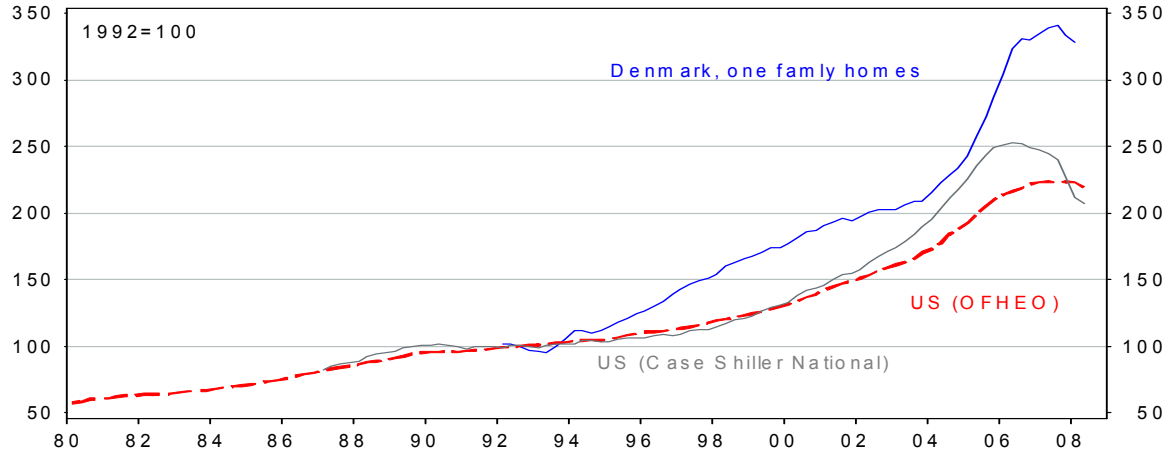
Principle of Balance Mortgages Prevent It



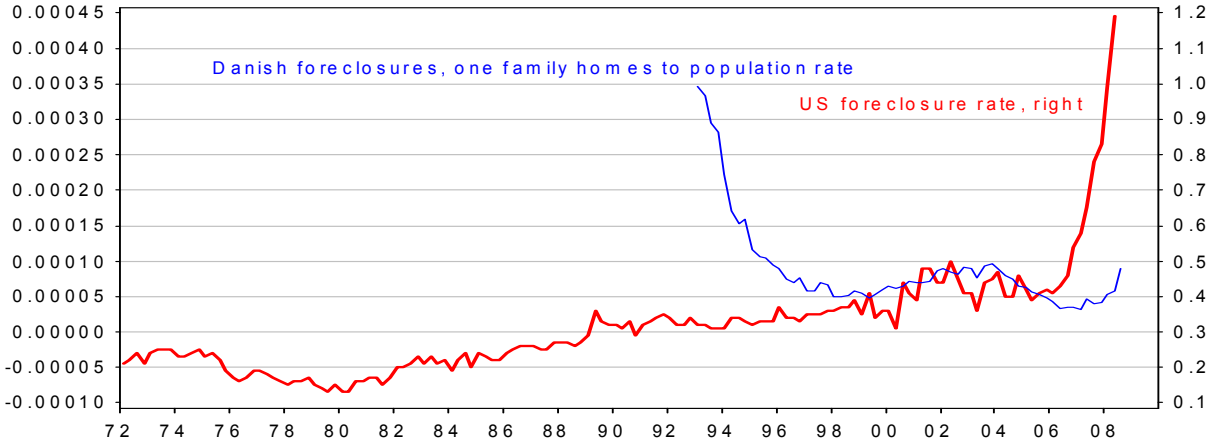
- **Danish Mortgage Loans (PoB)**: Can always be prepaid at par or redeemed by purchasing the bond at the market price
- MCI acts as a liability advisor, encouraging homeowner to tap issue into the most expensive bond in the market

Since the value of homes and the associated mortgage bonds tend to move in the same direction, Principle of Balance prevents homeowners from having negative equity in their homes

Denmark Experienced a Larger Housing Bubble…



…But Has Avoided Widespread Foreclosures



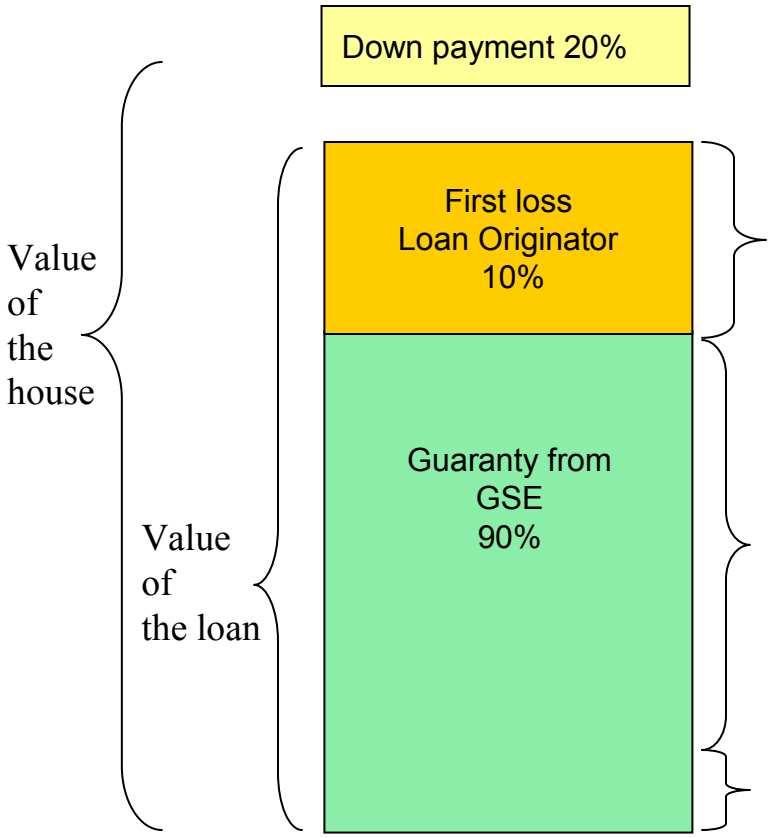
How Do You Get There?

- This is a unique opportunity to "get it right"
- The GSEs should be transformed into PoB Guarantee Vehicles only
  - The Portfolios should be sold off and Fannie/Freddie should be merged
- When possible, existing mortgages will need to be modified so principal does not exceed market value of the houses
  - Need to incentivize servicers as they are best placed to workout the loans
  - Will need legislation to address tranche warfare within securitizations
- Credit risk allocation
  - First to originator, then to GSE
- Borrower gets a market rate based on transparent bond pricing
  - Bonds are issued on a daily basis
  - Loan is cancelable at the lower of the market price or par – the Principle of Balance
- Federal Reserve should assign lowest possible BIS risk capital requirements on the new PoB bonds and assign lower margin requirements at the TAF, PDCF, TLSF, FHLB and Discount Window for PoB bonds
- The new system needs to preserve a role for credit unions, community banks and other "smaller" players
- A Unitary Financial Regulator should be established to oversee the entire mortgage credit process
  - FDIC, FHFA, FRB, OCC, OTS and NCUA
- The new regulator should be a prudential regulator and act 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

Lowering Interest Rates, Reducing Existing Negative Equity

- Lower interest rates through new or expanded government guarantee programs
  - the issuers would be on the hook to the Federal agency for the first 10% of the credit risk
  - the issuers would charge a fee for taking the credit risk
  - the Government should extend the term of its borrowing to match the term of these liabilities
- ***One way or another, it is essential to stabilize house prices and the value of mortgage securities.***

Credit Enhancement Structure for Shared Platform

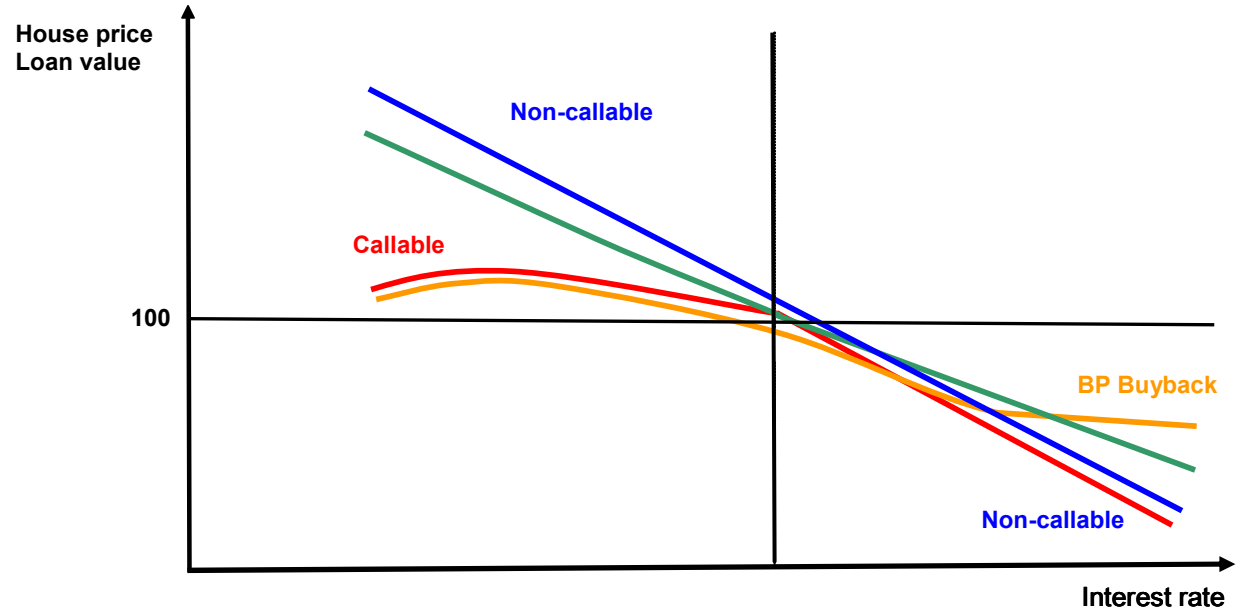


- Provided by Originator and/or MI industry
- Backup capital and industry skill to be provided by MI Reinsurance Industry

- AAA rating flows from GSE guarantee, which
- The value of the house will serve as collateral
- Bond holder looks to GSE for full faith and credit guaranty
- GSE looks to Originator remove bad loans from the pool
  - Originator purchases parri passu amount of bonds from pool at lower of market or par

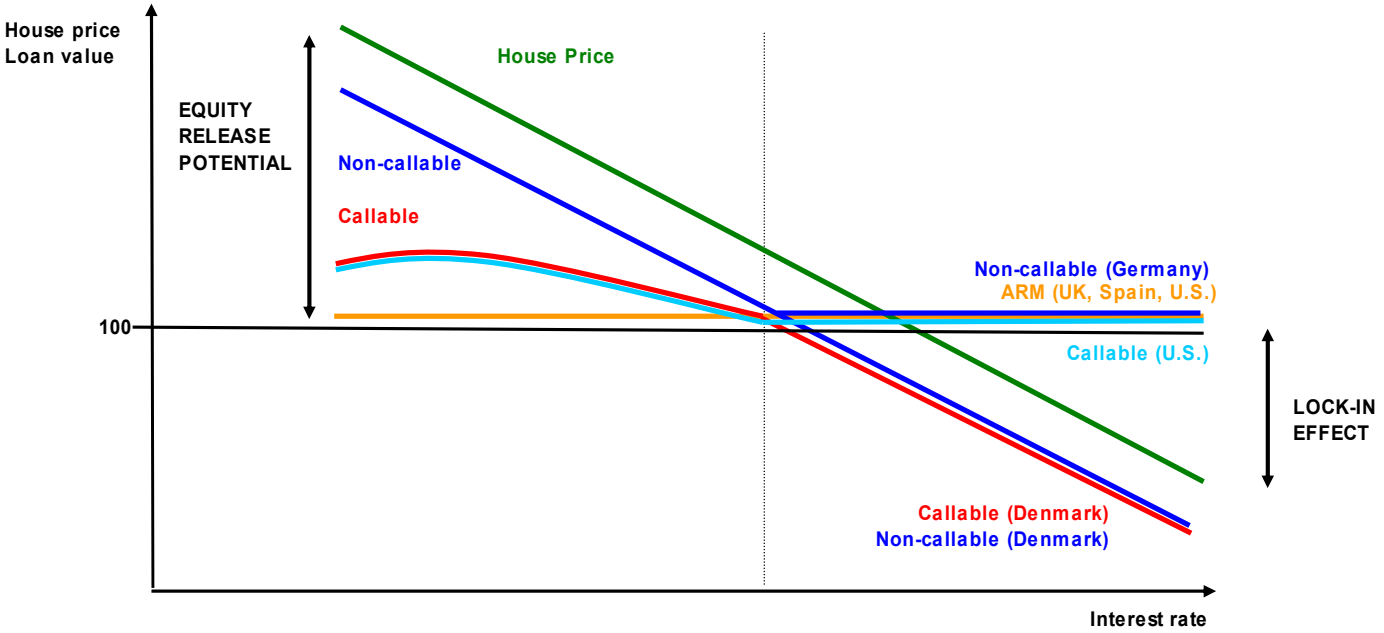
- First Loss Capital calculated by applying 8% capital requirement

Convexity Effect of Securitization Choice



- 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

Price/Yield Graph of Various Mortgage Risk Transfer Structures



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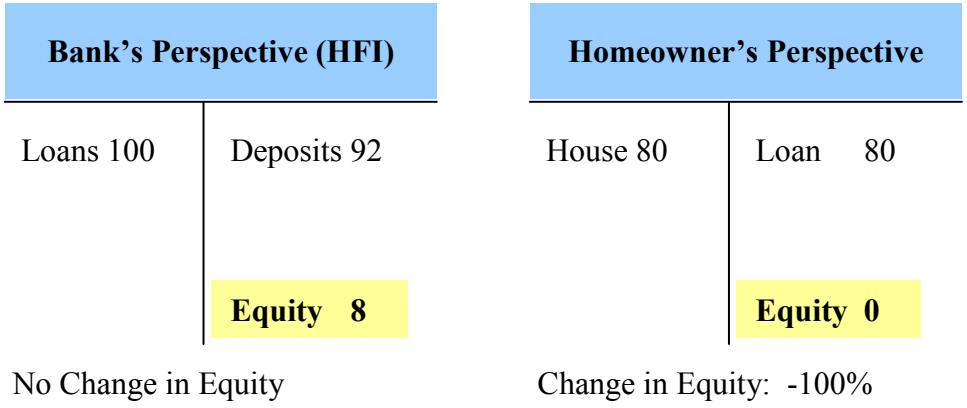
- All Adjustable Rate Mortgages are worth Par in most Interest Rate Scenarios. This implies that the borrower has no hedge against the interest rate sensitivity of home prices exposing him to more significant fluctuations of net home equity
- **Danish Mortgage Loans**: Can always be prepaid at par or 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

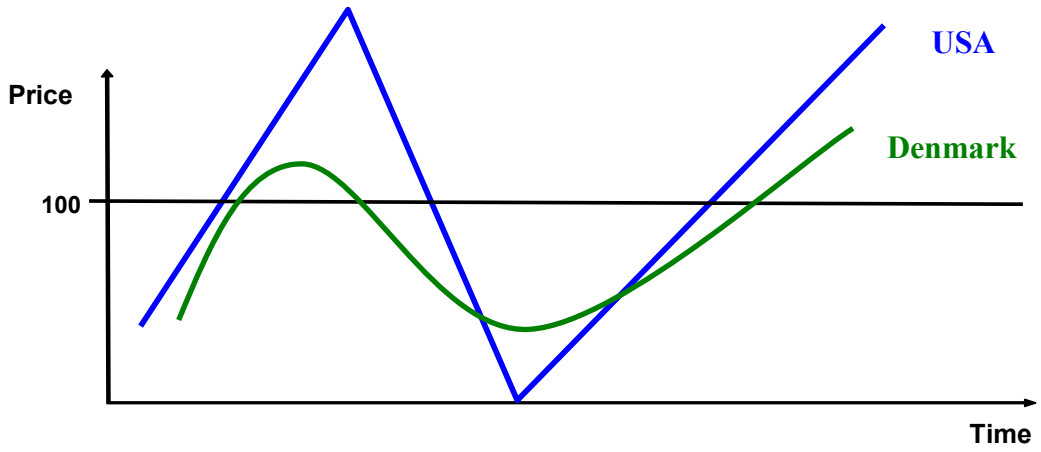
Market Potentially Has Still More Pain to Come

- In the U.S. Non-Agency market, the homeowner's liability is now $1.5 trillion higher than the market value of that liability and the gap continues to grow
- GAAP accounting allows banks to pretend that their assets are worth the amortized cost basis, subject to quarterly credit review and reserving requirements
  - At current delinquency roll rates, banks have more reserves to come
- If a bank chooses "available for sale", the change in the free market price of the asset flows through the equity line but is not reported in the income statement
  - Such changes in equity are NOT counted for regulatory capital purpose
- If a security fails an "other than temporarily impaired" ("OTTI") test, it must be marked-to-market
  - Banks have several quarters before OTTI catches up



The Systematic Solution is to create a bridge between the depressed market price for non-agency mortgages and the homeowner

Long Term Interest Rate Volatility Reduced

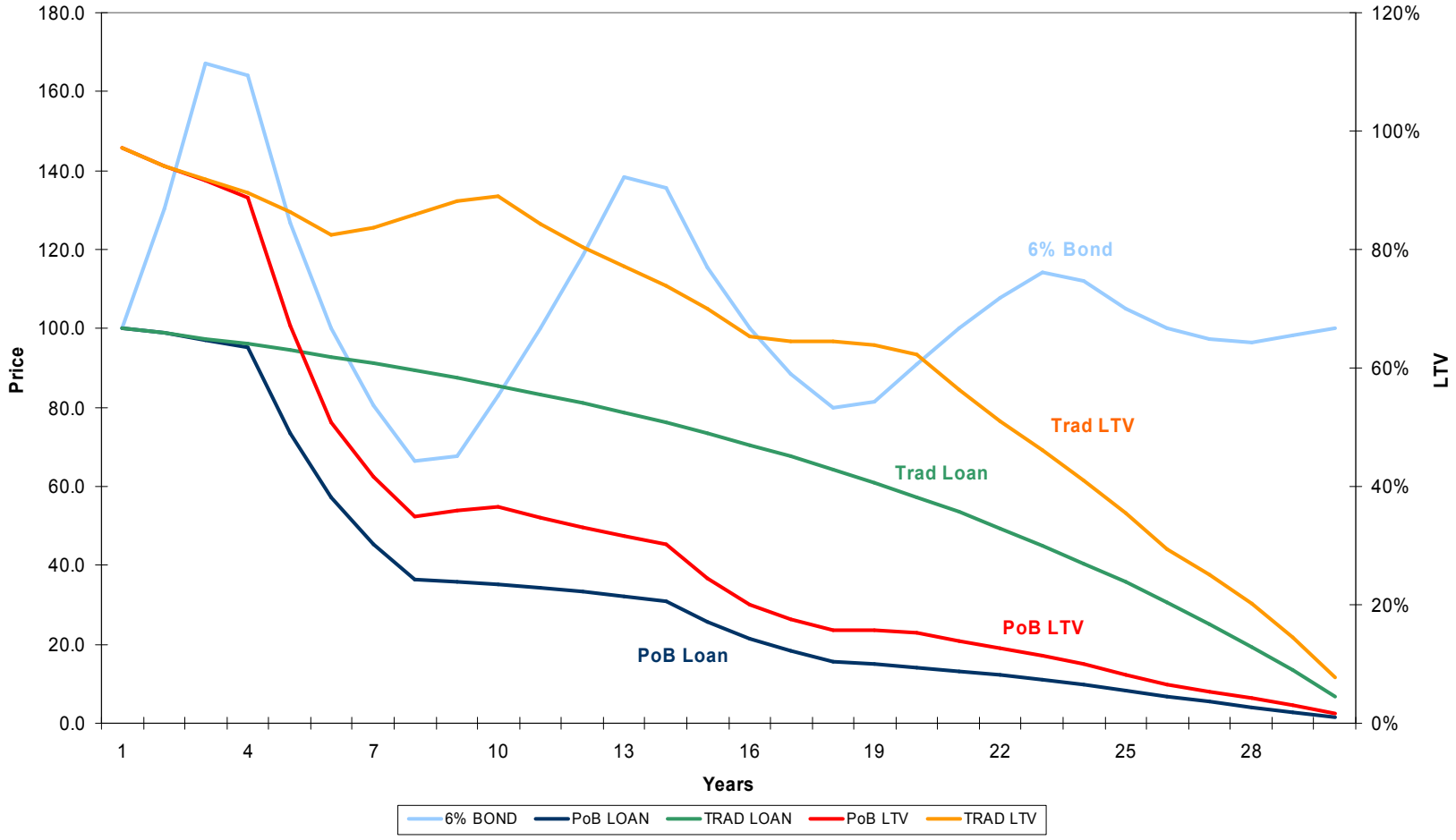


Option Adjusted Duration (Years)

	USA (orig. @ 101.6)			DK (orig. @ 98.9)		
	5.5%	4.5%	3.5%	5%	4%	3%
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

Credit Quality of Borrower Improves



- Simulated changes in LTV based upon typical interest rate cycle
- PoB loan refinances when rates fall 100 bp
- PoB loan balance principle buyback when rates rise 100 bp