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# **The U.S. Subprime Mortgage Crisis: Issues Raised and Lessons Learned**

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# Subprime Lending as a Financial Innovation

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- ◆ Financial innovations are commonly related to 3 conditions, all highly relevant to subprime lending:
  - Underserved borrowers and investors;
  - Advances in technology and know-how;
  - Benign or even encouraging regulatory regime.
- ◆ Past innovations have survived crises:
  - Junk bonds/Michael Milkin in the early 1980s.
  - Portfolio insurance in mid 1980s + 1987 crash;
  - LTCM in the 1990s, ended w/ 1998 liquidation.

# Issues Raised and Lessons Learned

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- ◆ Issues directly and specifically relating to subprime mortgage lending;
- ◆ Issues relating to the securitization of subprime mortgages;
- ◆ Issues affecting financial markets and institutions.

# Issues For Subprime Mortgage Lending

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- ◆ Benefits of subprime mortgage lending:
  - More than 10 million subprime loans, including refinancings, investments and speculation, etc.
  - More than 5 million home purchase subprime loans.
  - More than 1 million loans first time home purchases.
- ◆ Predatory lending (TILA, HOEPA, RESPA exist).
  - Suitability requirements are intriguing issue.
- ◆ Loan modifications before default (FHASecure).
- ◆ Limiting borrower costs from foreclosure.
  - <http://youwalkaway.com>

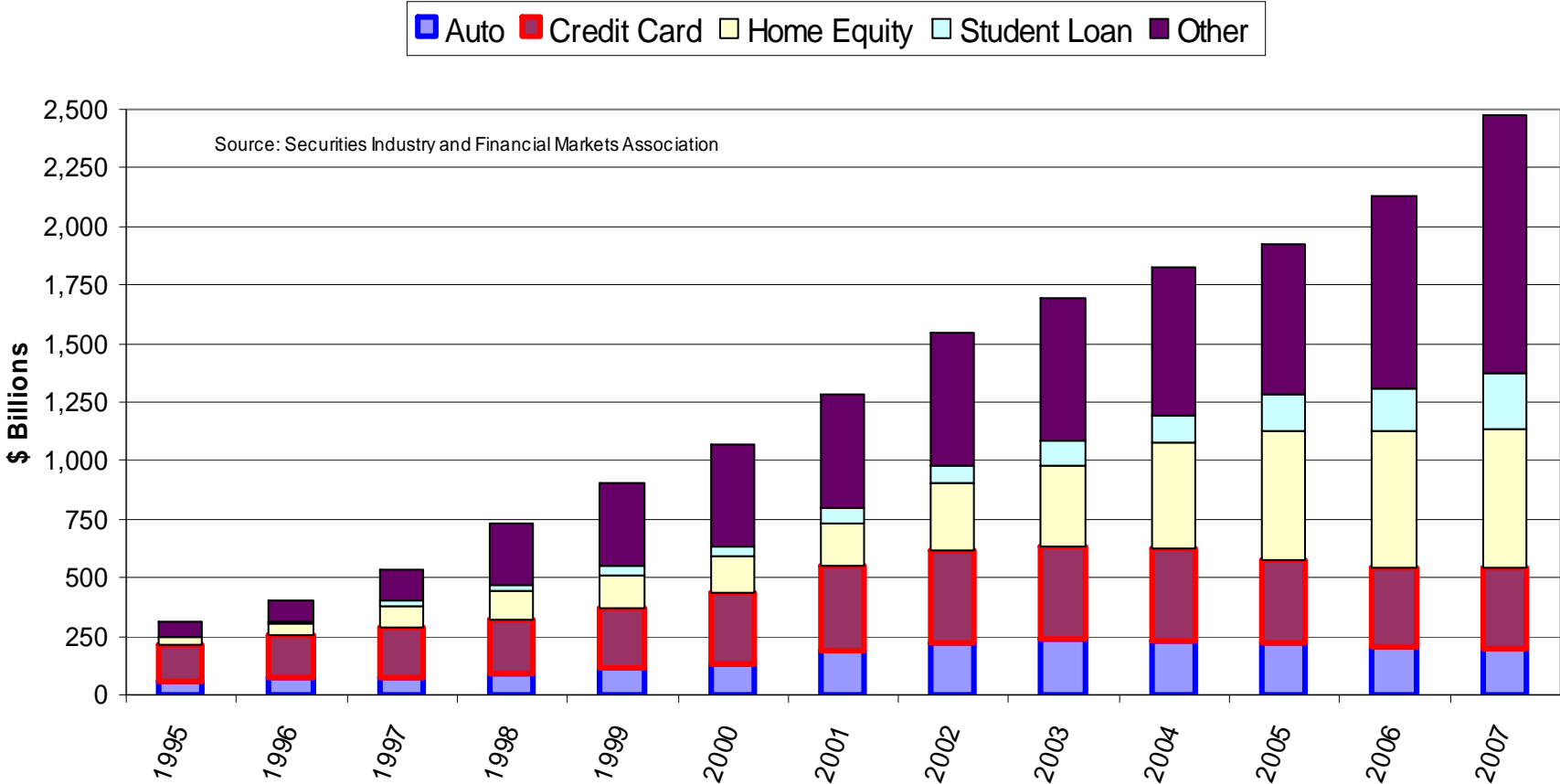
# Origins of Subprime Securitization

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- ◆ 1968 GNMA single-class MBS were first, based on FHA/VA mortgages; same safety as US Treasuries.
- ◆ Fannie Mae and Freddie Mac GSE MBS programs followed, with presumption of government backing.
- ◆ First “private-label” MBS started in mid-1980s.
  - Junior/Seniority “structure” to protect topic tranches.
  - Other credit enhancements: insurance, excess spread...
- ◆ Variety of higher-risk securitizations followed in 1990s: auto, credit cards, student loans, CMBS, home equity.
- ◆ No major crises to date.

# Non-MBS Growth of ABS

Figure 8: Non-MBS, Asset-Back Securities Outstanding



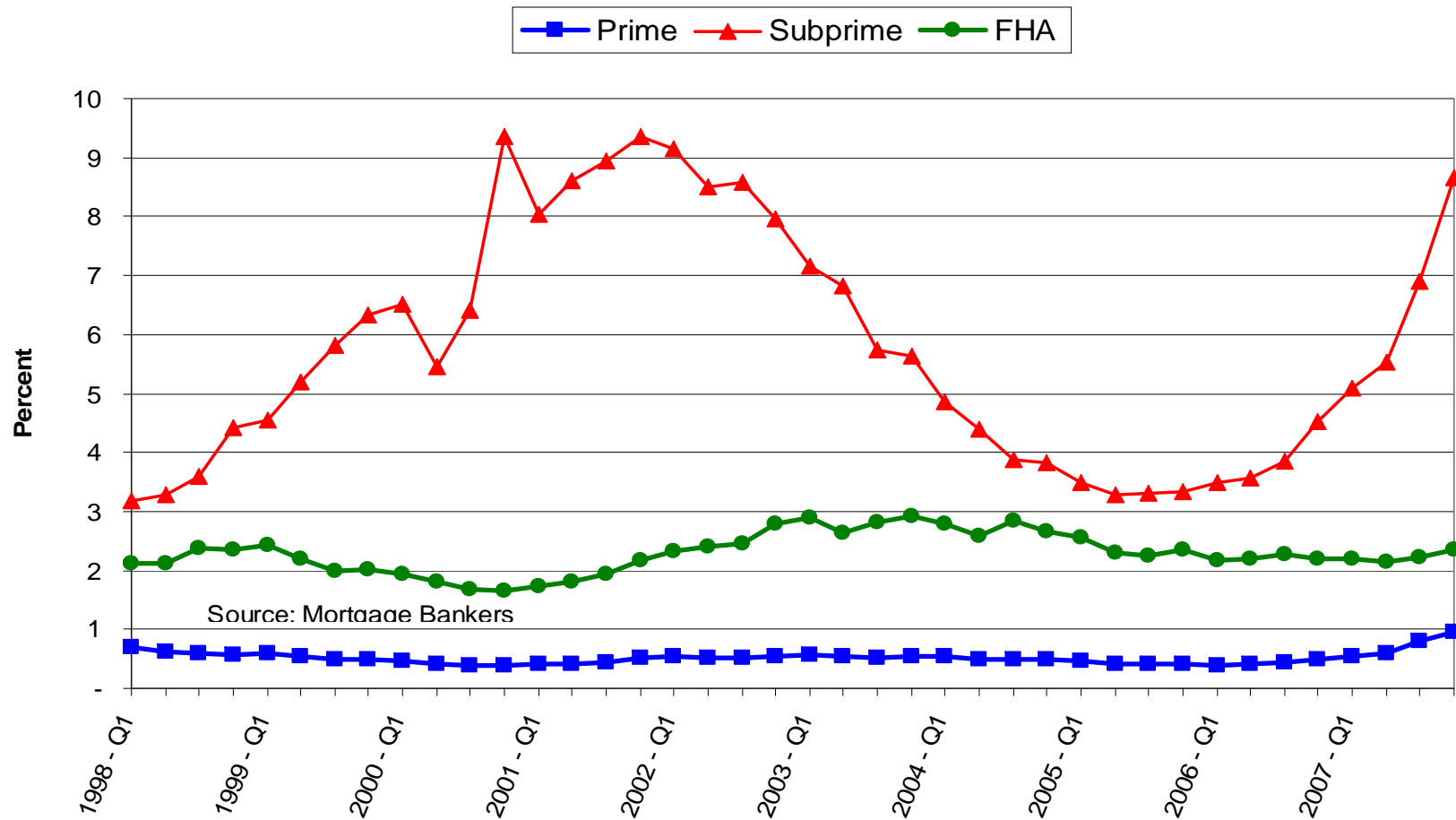
# Issues for Subprime Securitization

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- ◆ Is Securitization “moral hazard” source of crisis?
  - President’s Working Group suggests “moral hazard” passed bad loans to duped and negligent investors;
  - But largest investment & commercial banks, hedge & sovereign funds, institutional investors in world.
  - The name “subprime,” seems clear enough.  
Data on high delinquency and foreclosure rates readily and publicly available from 2002.
- ◆ Much more plausible that these investors believed the excess spreads were fair compensation for excess risks.

# Subprime Loan Foreclosures Peaked in 2002

Figure 5: Loans In Foreclosure as Percent of Category Total Outstanding



# Credit Rating Agencies (CRAs)

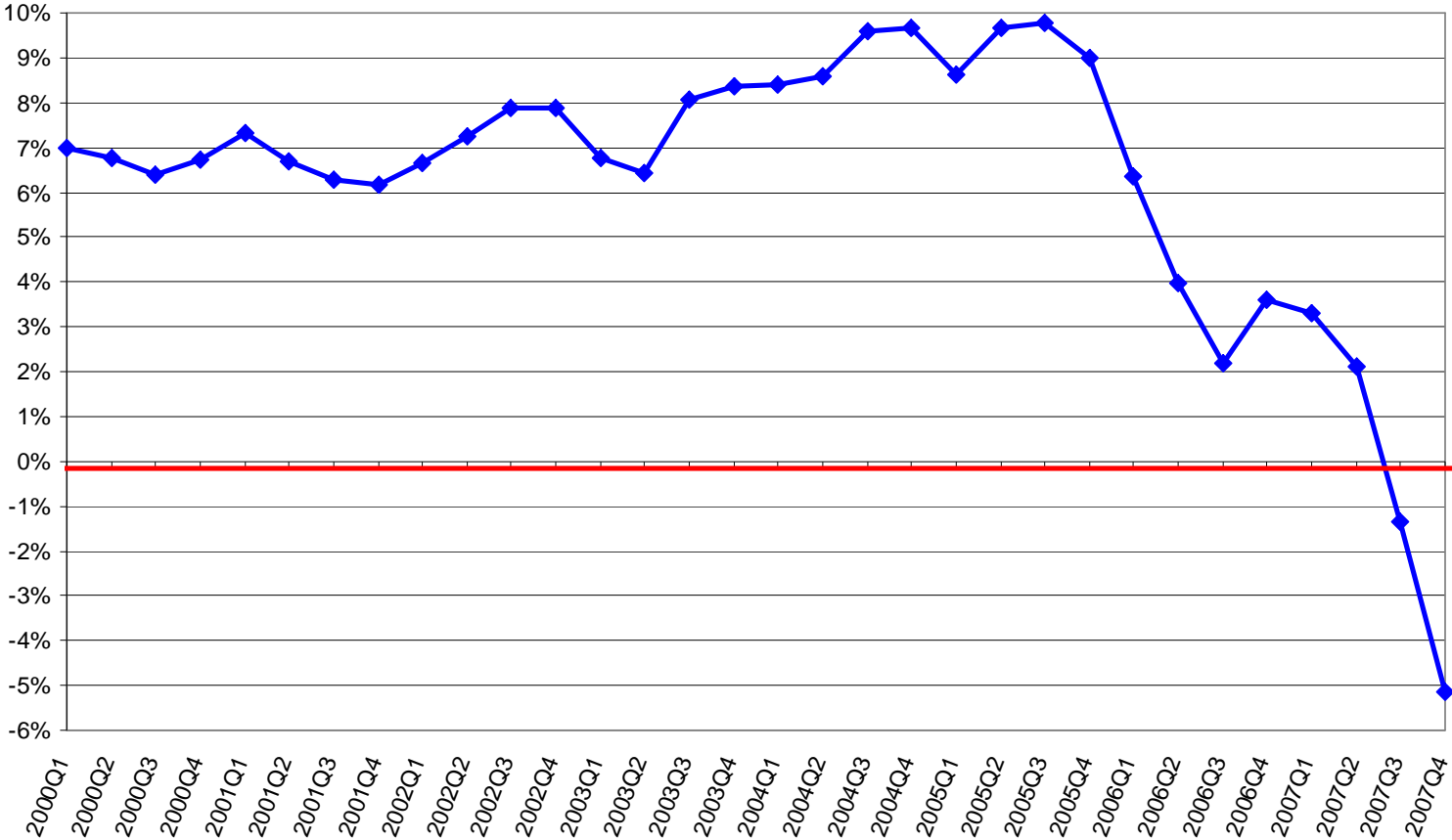
## Underestimated Risks

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- ◆ Three key Errors:
  - 1: Understated default from falling house prices;
  - 2: Understated correlated losses from (1);
  - 3: Failed to anticipate extent of falling home prices.
- ◆ An explanation: 2001-2002 defaults were created by FICO scores, not house price declines.
- ◆ Results:
  - Falling house price have created high default rates.
  - Correlated losses concentrated impact on CDOs.
- ◆ All major CRAs are now modifying their methods.

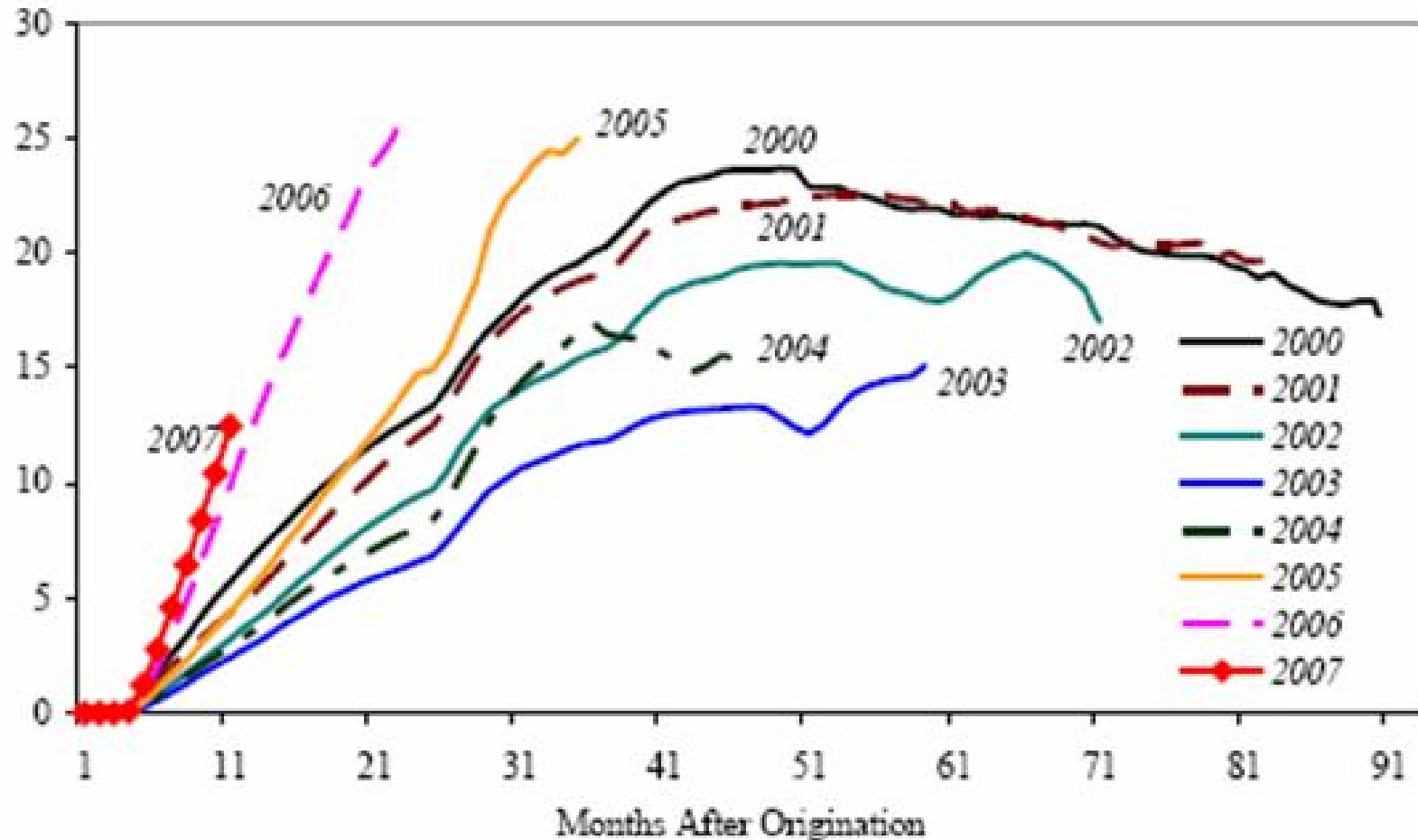
# OFHEO Index of House Price Inflation

Figure 7: The OFHEO House Price Index, Quarterly Changes at Annual Rates



# Changing Loan Quality Over Time

## Delinquency Rate 60 + Days



# Investor Strategies Concentrated Risks

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- ◆ Leverage created extraordinary risk levels:
  - 10 to 1 leverage, transforms a 10% expected annual loss into a 100% loss for a given initial capital.
- ◆ Funding long-term mortgage MBS and CDO with short-term loans creates major maturity mismatch.
- ◆ The combination of leverage and maturity mismatch remarkably parallels both 1980 S&Ls and 1998 LTCM.
  - This investment strategy of leverage and mismatch is capable of creating a crisis regardless of underlying.
  - S&Ls were prime mortgages, LTCM was US Treasury.

# Summary on Securitization

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- ◆ The economic benefits of securitization are intact:
  - Securitization spreads risks among diversified investors.
  - Tranching matches risk with investor risk tolerances.
- ◆ The “fundamental cause” was that lenders, securitizers, CRAs, investors, and perhaps the monetary authority all failed to remember that real estate booms with ever expanding lending inevitably end in price busts.
- ◆ The “good news” is that subprime MBS and CDOs were deemed suitable only for institutional investors.

# Financial Institutions and Markets

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- ◆ The Federal Reserve's loan for Bear Stearns merger:
  - Exceptional action since it allowed (i) low quality collateral and (ii) did not require recourse to all assets.
- ◆ LTCM liquidation, in contrast, carried out only by private sector investment banks (except Bear Stearns!)
- ◆ Unique aspects regarding the Bear Stearns loan:
  - Much larger amounts (\$30 billion versus \$3 billion);
  - Generally weakened condition of most investment banks;
  - Bear Stearns role as derivative counterparty threatened the entire financial system.

# Interlinking Counterparty Risks

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- ◆ Over \$500 trillion in outstanding amounts of notional derivative risks; \$45 trillion in credit derivatives alone.
  - Complex system of over-the-counter, bilateral contracts, all dependent on counterparties.
  - If one counterparty fails, a chain reaction is very likely.
- ◆ Derivative system now parallels the payments system as financial infrastructure requiring regulatory control.
  - Need tighter regulatory control & capital requirements.
  - Separate investment risks from counterparty functions.
  - Prompt correction action (C. Cox testimony).

# Market Liquidity and Opaque Securities

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- ◆ Subprime crisis has become, in part, a liquidity crisis:
  - MBS/CDO prices appear below “fundamental” value.
  - Opaque features of subprime MBS/CDOs;
  - Mark to market price accounting makes it very public.
  - Hard to borrow against even high quality collateral.
- ◆ More liquidity issues: Structured Investment Vehicles.
- ◆ Fed has properly flooded system with liquidity, but without major success to date.
- ◆ Long-term solution requires move to tier-matching. GSEs subject to similar liquidity risk.

# Insurance

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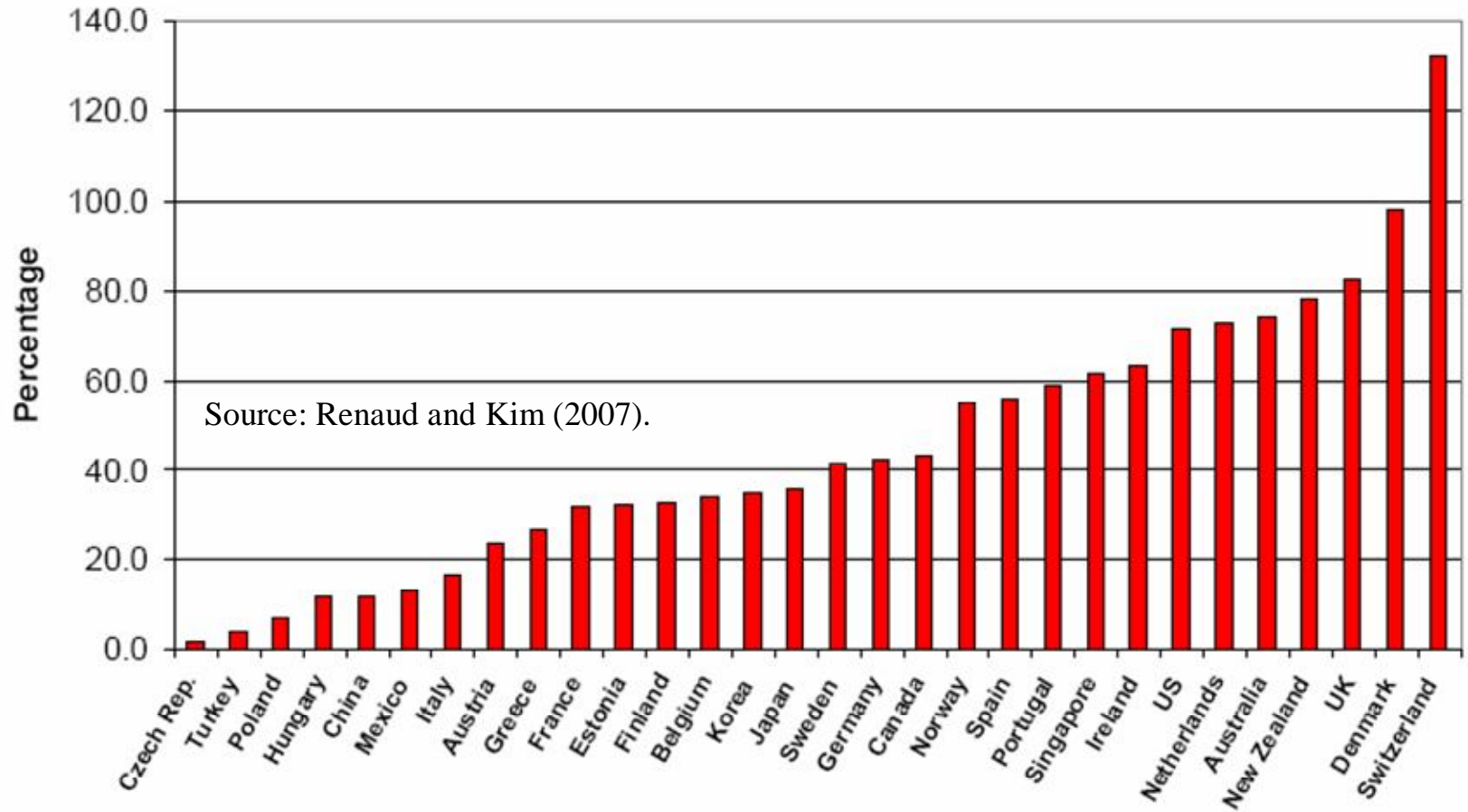
- ◆ Treasury Blueprint raises federal insurance regulation.
- ◆ The role of insurance with subprime mortgage lending:
  - Monoline insurers covered various MBS/CDO tranche.
  - Investment bank counterparties in credit default swaps.
  - Catastrophe insurers always run risk of default.
- ◆ State laws reflect monoline insurers as special cat lines..
  - Capital requirements match risk, but necessary residual.
  - That is purpose of monoline requirement.

# Mortgage Markets in Emerging Economies

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- ◆ Mortgage markets provide great potential for growth and development in emerging economies:
  - Financial development essential component of growth.
  - Mortgages use existing land and structure collateral.
  - Encourages homeownership and home construction.
  - Mobile labor force benefits from existing home sales
- ◆ Strong demand for mortgage loans can be assumed.
- ◆ Bottleneck 1: reliable legal system/property rights.
- ◆ Bottleneck 2: Bank lending exceeds loanable funds.

# Outstanding Mortgage to GDP Ratios



# Financial Market Links to Augment Bank Lending in Emerging Economies

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- ◆ A bank may issue special covered mortgage bonds secured by the bank's mortgage pools. The bonds would be sold in local or foreign capital markets.
- ◆ The banking system/government forms a mortgage bank to purchase mortgages, funding the portfolio with debt issued in local or foreign capital markets.
- ◆ Securitization can expedite the sale of mortgages to capital market investors, either locally or abroad.

# Pitfalls of Mortgage Lending in Emerging Economies

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- i. Consumer protection legislation is essential.
- ii. Grey markets create incomplete income documents.
- iii. Legal infrastructure for property rights is critical.
- iv. Mechanisms are required for loan modifications, and to minimize the costs associated with default.
- v. Mortgage loans are unavoidably risky, putting the banking system at increasing risk. Capital requirements and other system regulations are key.
- vi. Emerging economies are no less subject to boom-bust real estate cycles.

## Concluding Comments (1): Reformed Subprime Lending is Feasible

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- ◆ Subprime loans created both benefits and costs. The system can be reformed to provide future benefits.
- ◆ Economic fundamentals of securitization are intact.
- ◆ Rating agencies dramatically understated falling home prices as basis of default/correlated defaults.
- ◆ Investors concentrated risk through leverage and maturity mismatch.
- ◆ Lenders, securitizers, CRAs, perhaps Fed. all forgot that lending induced real estate booms must end.

## Concluding Comments (2): Systemic Risks Requires New Regulation

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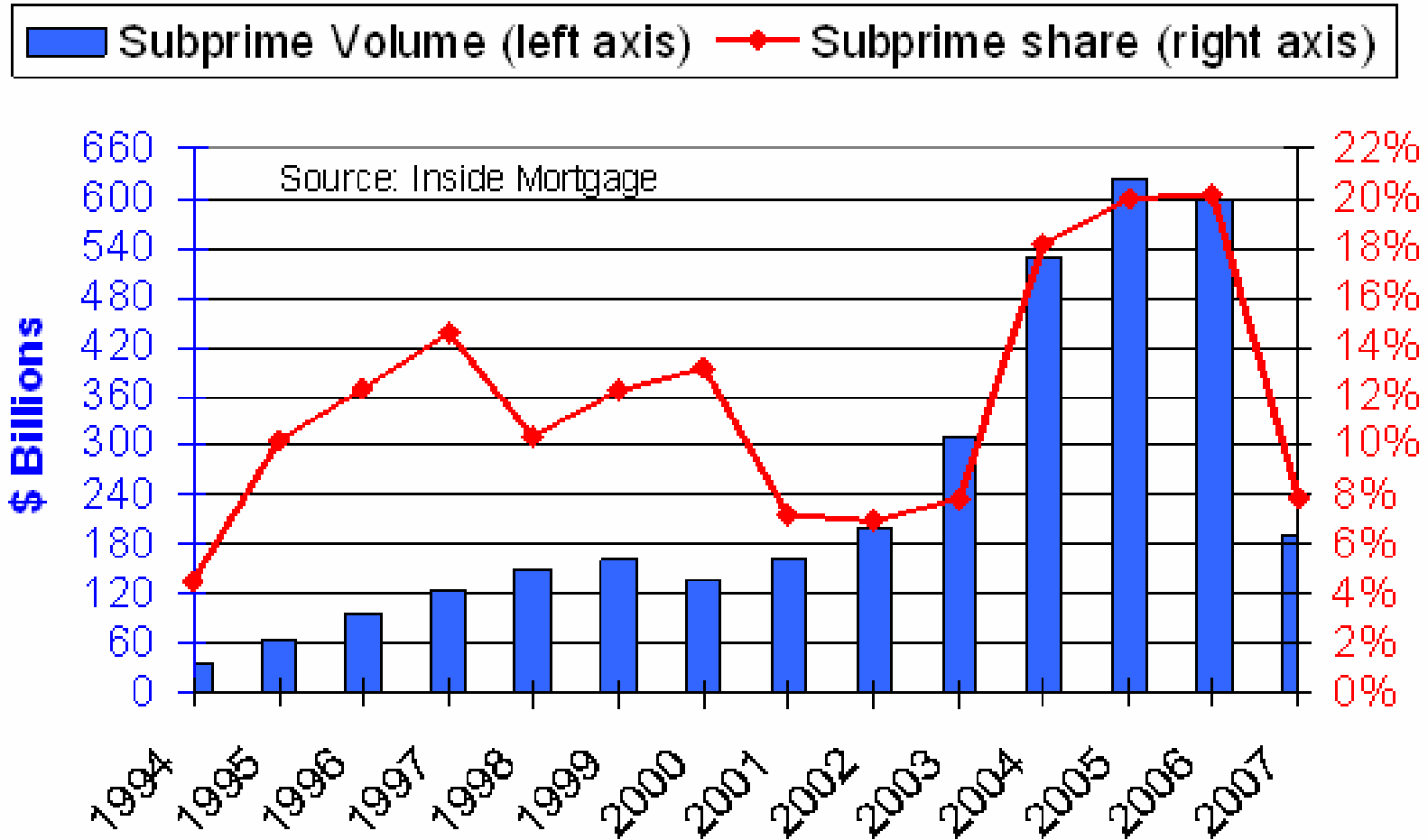
- ◆ The Fed's Bear Stearns loan reveals that the derivative counterparty system is now a fundamental part of financial market infrastructure. It must be protected by strong regulatory action:
  - Capital requirements
  - Separate investment and counterparty risks.
- ◆ This is not reflected in:
  - President's Working Group Policy Statement;
  - New US Treasury Blueprint.

# Concluding Comments (3): Emerging Economy Growth & Development

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- ◆ Mortgage markets in emerging economies will provide key benefits:
  - Financial development and real growth are highly linked.
  - Real estate provides high quality collateral.
  - Benefits include homeownership, construction, and increase labor market mobility.
- ◆ The Pitfalls are well marked by the subprime crisis.
- ◆ Key bottlenecks:
  - Legal infrastructure for property rights;
  - Capital market access to augment bank lending.

# Subprime Mortgage Lending



# MBS Securitization Rates

Figure 9: Securitization Rates for Mortgage Categories

