

# The Subprime Meltdown

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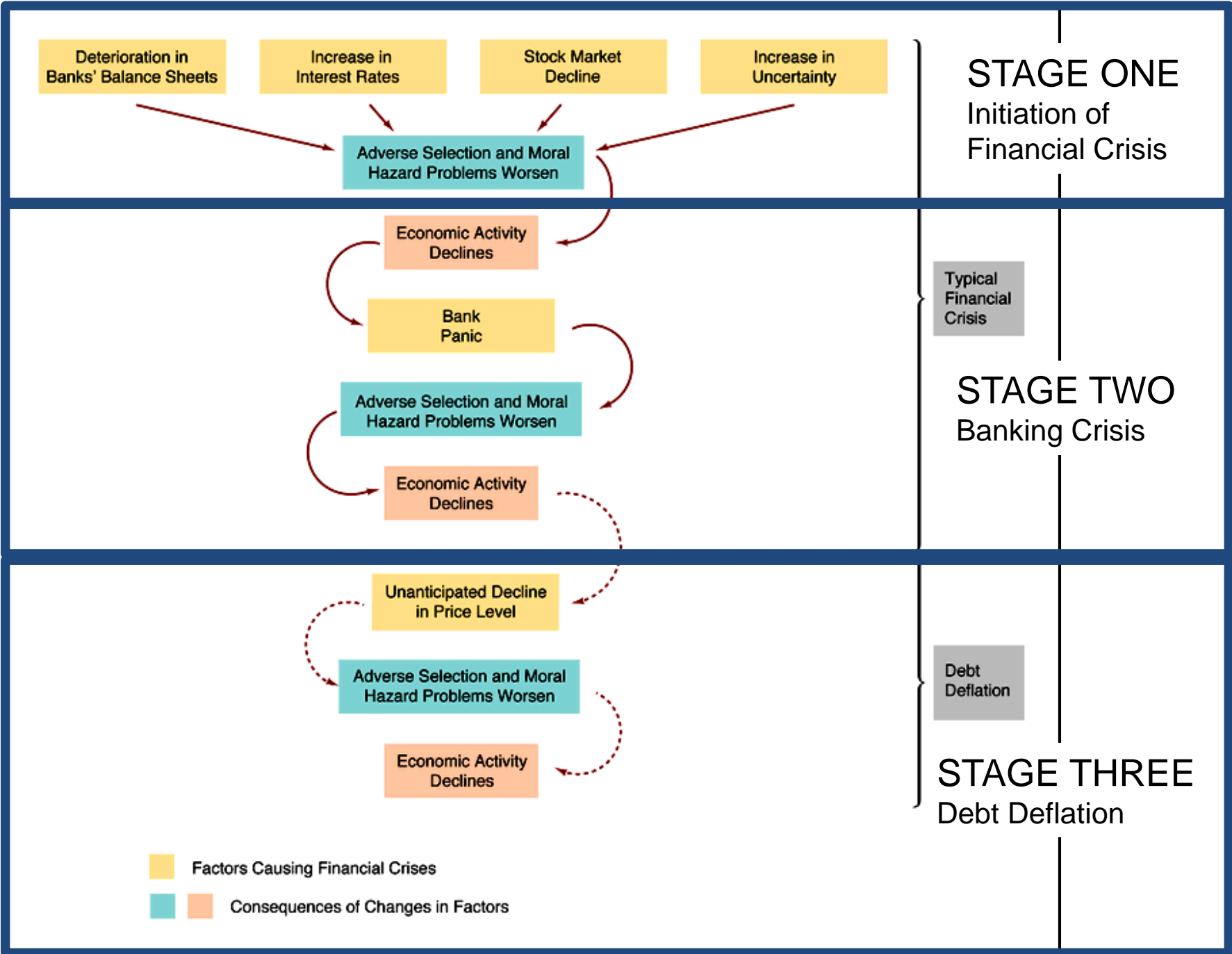
Brunnermeier (2009)

# Dynamics of Past U.S. Financial Crisis

- The subprime crisis is only one of a number of financial crises in U.S. history
- Financial crises in the U.S. have progressed in two and sometimes three stages

# Stage One: Initiation of Financial Crisis

- There are several possible ways that financial crisis start
  - Deterioration in fin. Institutions' balance sheets: lead to ***deleveraging*** (fin. Institutions cut back on their lending), which reduces the overall ability to cope with asymmetric information problems
  - Asset price decline: when asset bubble bursts, the resulting decline in net worth increases asymmetric information
  - Spike in interest rates: lead to a decline in cash flow and a reduction in the number of good credit risks, both of which increase asymmetric information problems
  - General increase in uncertainty: in period of higher uncertainty, adverse selection and moral hazard increase



# Stage Two: Banking Crisis

- Because of worsening business conditions and uncertainty, depositors/creditors begin to withdraw their funds from banks
- Hence, banking crisis or bank panic often ensues
- The resulting decline in the number of banks results in the worsening adverse selection and moral hazard problems in credit markets, leading to a further spiraling down of the economy

# Stage Three: Debt Deflation

- ***Debt deflation*** is a theory that recessions and depressions are due to the overall level of debt rising in real value because of deflation, causing a further deterioration in firms' net worth
- With debt deflation, the adverse selection and moral hazard problems become more severe

# The Subprime Financial Crisis of 2007 - 2008

- We can say that mismanagement of financial innovation in the subprime mortgage market and a bursting of a bubble in housing price were the underlying forces behind the financial crisis of 2007 - 2008

# The Subprime Financial Crisis of 2007 - 2008

- **Financial innovations in the Mortgage Markets**
  - ***Subprime mortgages*** are mortgages for borrowers with less-than-stellar credit records
  - ***Alt-A mortgages*** are mortgages or borrowers with higher expected default rates than prime, but with better credit records than subprime borrowers
  - High-risk mortgages are bundled and risk-quantified in a standardized debt security called ***mortgage-backed securities***
  - ***Structured credit products*** (e.g. CDOs, CDO2s, CDO3s) are derived from cash flows of underlying assets and can be tailored to have a particular risk characteristics
  - ***Structured investment vehicles*** pay off cash flows from pool of assets such as mortgages (like CDOs), but they issued asset-backed commercial papers (which is short-term)

# The Subprime Financial Crisis of 2007 - 2008

- **House Price Bubble Forms**
  - The development of the subprime mortgage market help raise U.S. homeownership rates to the highest level in history
  - The asset price boom in housing helped stimulate the growth of the subprime mortgage market
  - The growth of the subprime mortgage market, in turn, increased the demand for houses and fueled the boom in housing prices

# The Subprime Financial Crisis of 2007 - 2008

- **Agency Problem Arises**

- The subprime mortgage market was based on an ***originate-and-distribute*** model
- Unfortunately, the originate-and-distribute model is subject to the principal-agent problem, because financial institutions have weak incentives to make sure that the mortgage is of good credit risk
- Mortgage brokers often did not make a strong effort to evaluate whether the borrower could pay off the loan or might even encourage households to take on mortgages they could not afford (→ adverse selection)
- Commercial and investment banks, who earned large fees from MBSs and CDOs, also had weak incentives to monitor the borrowers (→ moral hazard)

# The Subprime Financial Crisis of 2007 - 2008

- **Information Problems Deepened**
  - The structured products like CDOs, CDO2s, and CDO3s can get so complicated that it can be hard
    - to value the cash flows of the underlying assets for a security
    - to determine who actually owns these assets
  - The increased complexity of structured products can actually destroy information, making asymmetric information problems worse

# The Subprime Financial Crisis of 2007 - 2008

- **Housing Price Bubble Bursts**
  - When asset prices rise too far out of line with fundamentals, they must come down
  - With housing prices falling after their peak in 2006, the rot in the financial system began to be revealed
  - The decline in housing prices made the value of the house fall below the amount of the mortgage
  - Struggling homeowners had tremendous incentives to walk away from their homes and just send the keys back to the lender
  - Defaults on mortgages shot up sharply

# The Subprime Financial Crisis of 2007 - 2008

- **Crisis Spreads Globally**

- Although the problem originated in the U.S., the wake-up call came from Europe
- After Fitch and S&P announced ratings downgrades on mortgage-backed securities and CDOs of more than \$10 million, the asset-based commercial paper market seized up and BNP Paribas (French investment house) suspended redemption of shares held in some of its money market funds
- Banks began to hoard cash and were unwilling to lend to each other
- The drying up of credit led to the first major bank failure in the U.K. in over 100 years when Northern Rock sought liquidity support from Bank of England in September 2007

# The Subprime Financial Crisis of 2007 - 2008

- **Banks' Balance Sheets Deteriorate**
  - The accelerated decline in U.S. housing prices led to rising defaults on mortgages
  - The value of MBSs and CDOs collapsed, leading to larger write-downs at banks and financial institutions
  - With weaker balance sheets, these institutions began to deleverage, selling off assets and restricting their loans

# The Subprime Financial Crisis of 2007 - 2008

- **High-Profile Firms Fail**

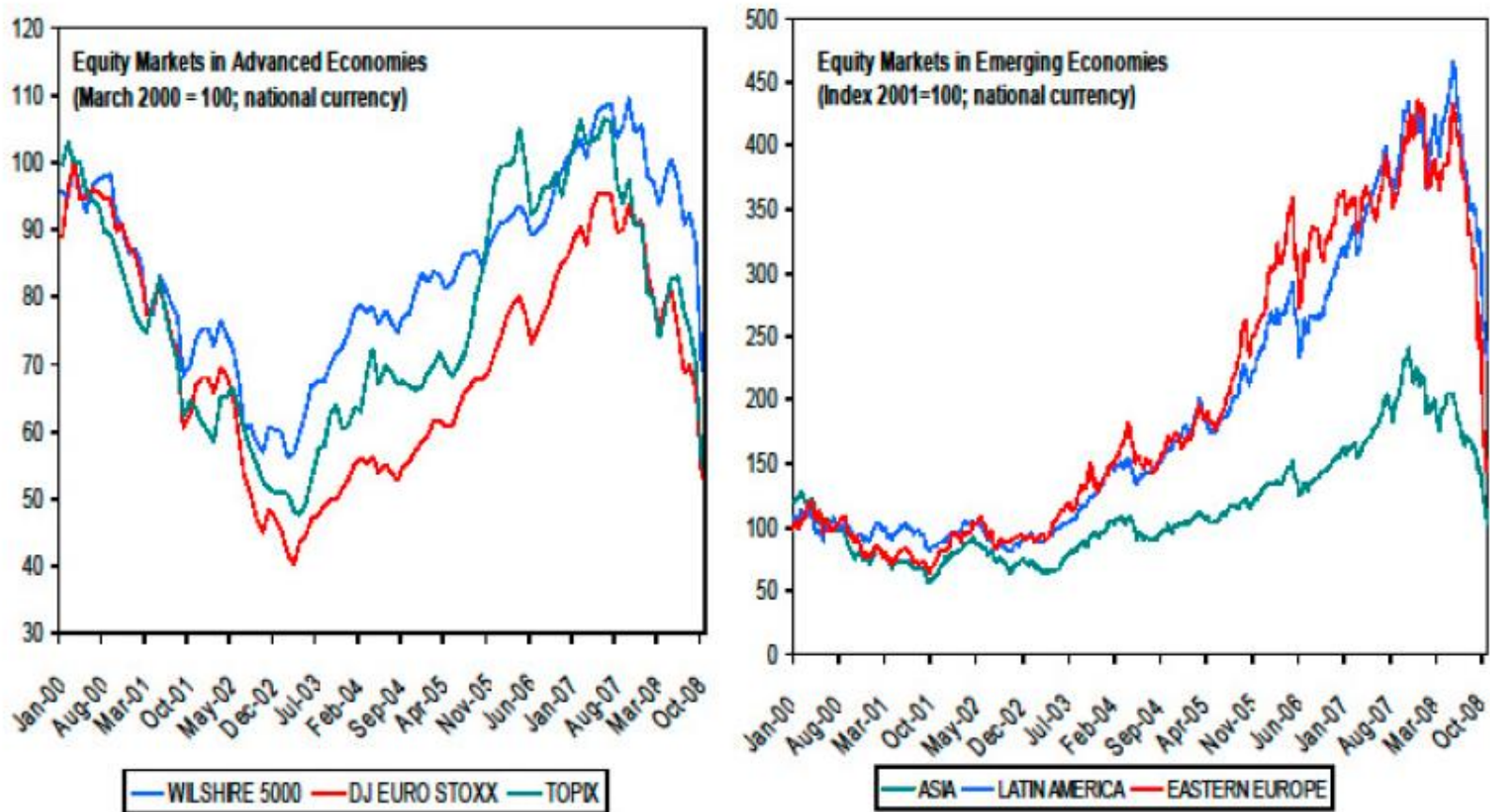
- In March 2008, Bear Stearns, the fifth-largest investment bank, had a run on its funding and was forced to sell itself to J.P. Morgan for less than 5% of what it was worth just a year earlier
- In the deal, the Federal Reserve had to take over \$30 million of Bear Stearns' hard-to-value assets
- In July 2008, Fannie Mae and Freddie Mac, the two privately owned government-sponsored enterprises, had to be protected by the U.S. Treasury and the Federal reserve
- On September 15, 2008, Lehman Brothers, the fourth-largest investment bank, filed for bankruptcy, making it the largest bankruptcy filing in the U.S. history
- The day before, Merrill Lynch, the third-largest investment bank, announced its sale to Bank of America
- On September 16, 2008, the Federal Reserve organized a bailout for AIG in exchange for an 80 percent equity stake

# The Subprime Financial Crisis of 2007 - 2008

- **From Financial Crisis to Economic Crisis**
  - The overall stock market fell off a cliff
  - Credit for firms and local and state governments tightened, infecting the global economy
  - The worry that the financial crisis was becoming worse led to a dramatic decrease in stock markets, and to a dramatic fall in consumer and firm confidence around the world

# The Subprime Financial Crisis of 2007 - 2008

## Figure 8a. Decrease in Stock Prices

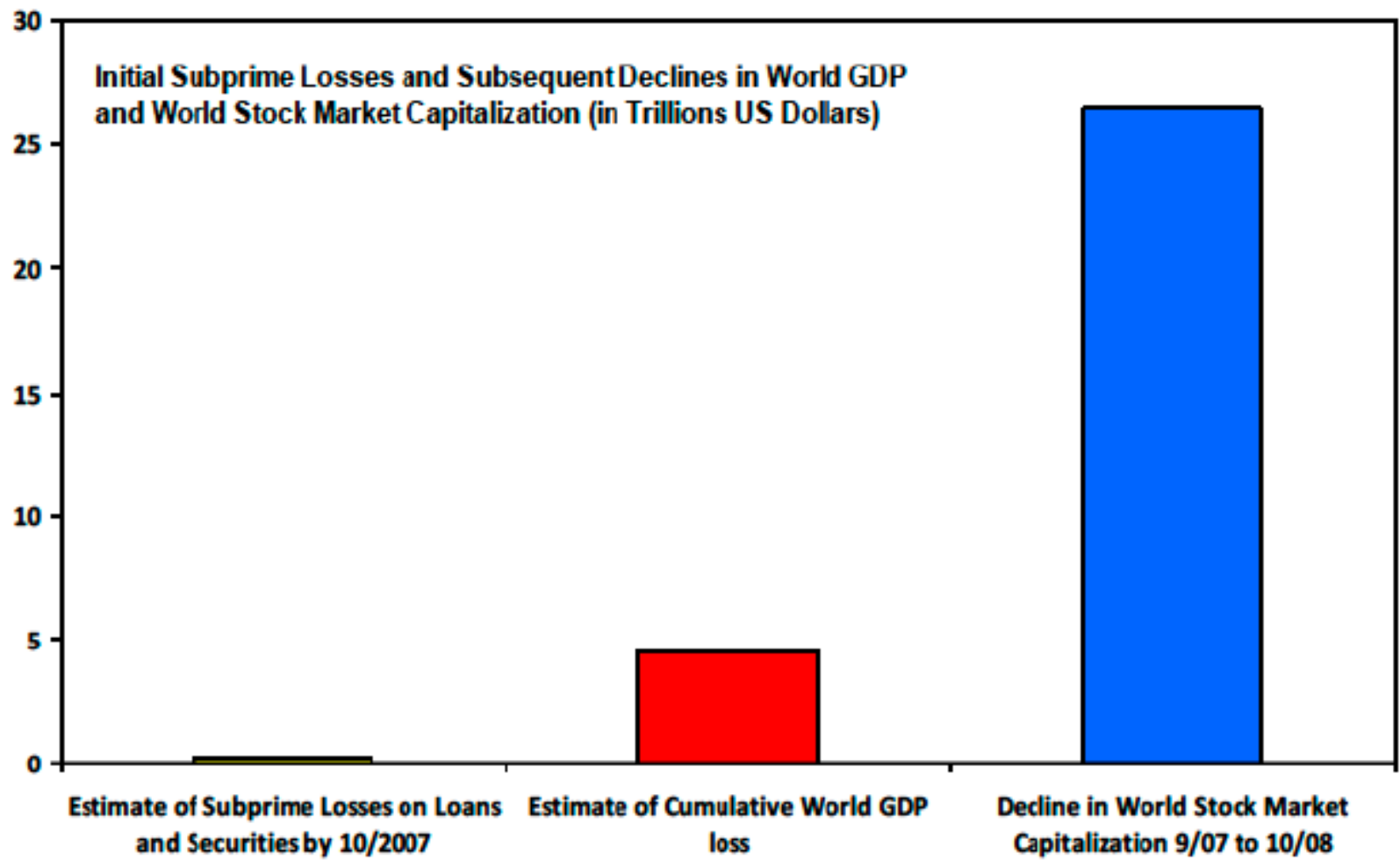


Source: Bloomberg and IMF staff estimates.

# The Subprime Financial Crisis of 2007 - 2008

- In the following figure,
  - The first bar shows the estimated losses on U.S. subprime loans and securities, as of October 2007, at about \$250 billion
  - The second bar shows the expected cumulative loss in world output associated with the crisis for the years 2008 to 2015, as of November 2008, at \$4,700 billion
  - The third bar shows the decrease in the value of stock markets, measured as sum of the decrease in stock market capitalization from July 2007 to November 2008, equal to about \$26,400 billion

**Figure 1. Initial Subprime Losses and Declines in World GDP and World Stock Market Capitalization**



Source: IMF Global Financial Stability Report; World Economic Outlook November update and estimates; World Federation of Exchanges.

# At this point ...

- The sequence of events is a vivid reminder of how shocks can get amplified to a full-blown financial crisis when liquidity evaporates
- The key question is how the original loss of several hundred billion dollars in the mortgage market was sufficient to trigger such an extraordinary series of worldwide financial and economic consequences