Key In-Class Discussion Questions

- Distinguishing between economic growth and economic development
- Economic growth/development, financial repression, and financial crises
- According to Mishkin, what are the typical causes and subsequent flow of events characterizing recent financial crises in the U.S.? In emerging market countries?

Economic Growth vs. Economic Development

**Economic Growth:**
Changes in the **size** of an economy, typically measured by GDP

**Economic Development:**
Changes in the **structure** of an economy (infrastructure, organization, and governance)
Effects of Financial System on Economic Growth and Development

◆ Underdeveloped Financial System
  – A situation referred to as financial repression (Mishkin, p. 187)
  – Poor legal system;
  – Weak accounting standards;
  – Too much political control (government directs credit, financial institutions are nationalized,…)
  – Inadequate government regulation

◆ Can Retard Economic Growth and Economic Development
Financial Crises

- **Financial Crisis Defined**
  - A major disruption in financial markets characterized by a *sharp decline in asset prices* and the *failures of many financial and nonfinancial firms* (Mishkin, p. 193)

- **Countries characterized by financial repression are more at risk:**
  - Fewer safeguards against trigger events happening.
  - Inadequate or inappropriate response to trigger events when they do happen.
Financial Crises Worldwide
(Mishkin, Chapter 11, Fig. 2, p. 268)
<table>
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<tr>
<th>Date</th>
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<th>Cost as a Percentage of GDP</th>
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Key Puzzle About Many Observed Financial Crises

◆ How can a country shift so dramatically from a path of reasonable growth before a financial crisis to a sharp decline in economic activity after a crisis occurs?

◆ Apparent Explanation: Role of positive feedback (reinforcement) in which an initial shock (trigger event) leads to subsequent events that amplify the original shock.
Key Puzzle... Continued

◆ **Apparent Explanation:** Role of *positive feedback (reinforcement)* in which an initial shock (trigger event) leads to subsequent events that *amplify* the original shock.

◆ **Example:** Falling prices (debt deflation) halts borrowing for new spending; and prices *keep* falling because of no new spending (*shock amplification*).
Mishkin’s Theory of Financial Crises

- Financial crises occur when some kind of disruption ("trigger event") in financial markets causes a sharp increase in adverse selection (AS) and moral hazard (MH) problems.

- In consequence, financial markets are no longer able to channel funds efficiently from savers (lenders) to investors (borrowers) who have productive investment opportunities.
Mishkin’s Theory of Financial Crises... Continued

KEY POINT:

◆ Financial collapse is *more* than just a *symptom* of a prior drop in aggregate output and a general economic decline.

◆ Financial collapse *precipitates* the drop in aggregate output and *deepens and prolongs* the crisis by hampering the efficient allocation of savings to investors.
Mishkin’s Theory of Financial Crises ... Cont’d

- For business cycles, economists have developed *leading indicators, coincident indicators,* and *lagging indicators.*

- Mishkin attempts to do something similar for financial crises.

- He identifies Stage 1 *trigger events* for financial crises (leading indicators), and *Stage 2 and Stage 3 events* that then subsequently tend to occur *during* a financial crisis (coincident indicators).
Possible Trigger Events for Financial Crises

1) Asset Market Effects on Balance Sheets of Borrowing Firms (net worth ↓)
   - Drop in stock market prices
   - Unanticipated deflation
   - Unanticipated decline in domestic currency exchange rate E

2) Deteriorating Fin. Inst. Balance Sheets
   - Bank Panics and Failures → AS & MH ↑

3) Increased lender uncertainty → AS ↑

4) Interest rate increases → AS & MH ↑

5) Government fiscal imbalances (emerging market countries) → capital outflow → E ↓
Trigger Events … More Details

1) Asset Market Effects on Borrower Balance Sheets

■ Stock market decline
  • Decreases net worth of borrowing corporations.

■ Unanticipated decline in the price level
  • Nominal debt payment obligations increase in real terms, with no change in real value of assets, hence real net worth decreases.

■ Unanticipated ↓ in domestic currency exchange rate E
  • Increases domestic currency value of debt payments denominated in foreign currencies (liabilities ↑), hence decreases net worth.
2) Deterioration in Financial Institutions’ Balance Sheets

- Net worth reductions result in declines in lending
- Banking panics lead to
  - AS ↑ for depositors (lenders to banks) because they are more uncertain about bank default
  - MH ↑ for lenders due to **disintermediation** (reduction of intermediaries due to bank failures) resulting in need to depend more on securities markets with less info about issuers (borrowers)
3) **Increased lender uncertainty** (e.g., unexpected failure of well-known firms) results in AS ↑

4) **Increases in Interest Rates**
   - AS ↑ (“lemons problem”)
   - Cash flow ↓ increases need for external funds, resulting in AS ↑ & MH↑ for lenders not familiar with borrowers

5) **Government Fiscal Imbalances** (Emerging Markets)
   - Create fears of default on government debt, which results in debt price ↓ hence net worth ↓ for debt holders.
   - Foreign investors might pull their money out of the country, resulting in domestic exchange rate E ↓.
Fig. 1 Event Sequence in U.S. Financial Crises

STAGE ONE
Initiation of Financial Crisis

- Deterioration in Financial Institutions’ Balance Sheets
- Asset Price Decline
- Increase in Interest Rates
- Increase in Uncertainty

- Adverse Selection and Moral Hazard Problems Worsen

STAGE TWO
Banking Crisis

- Economic Activity Declines
- Banking Crisis
- Adverse Selection and Moral Hazard Problems Worsen
- Economic Activity Declines

STAGE THREE
Debt Deflation

- Unanticipated Decline in Price Level
- Adverse Selection and Moral Hazard Problems Worsen
- Economic Activity Declines

- Factors Causing Financial Crises
- Consequences of Changes in Factors
Dynamics of Past U.S. Financial Crises (Mish pp 196-206)

• **Stage One: Initiation of Financial Crisis**
  – Mismanagement of financial liberalization/innovation
  – Asset price boom and bust
  – Spikes in interest rates
  – Increase in uncertainty

• **Stage two: Banking Crisis**
  – Sorting out of insolvent banks (negative net worth) from banks with **temporary** liquidity problems

• **Stage three (Not Always Present): Debt Deflation**
  – Substantial unanticipated decline in price level
What Caused the U.S. Great Depression (1929-1939)?

Three Different Theories Proposed:

◆ Breakdown in the financial system was simply a response to (not a cause of) an initial decline in aggregate output. (not consistent with the empirical evidence)

◆ U.S. Great Depression caused by a rapid decline in money supply -- inappropriate monetary policy. ("Monetarists," e.g., Milton Friedman)

◆ General disruption occurred in financial markets that adversely affected aggregate output and prolonged the depression. (Mishkin’s view)
What Caused the U.S. Great Depression (1929-1939)?

Mishkin’s View: (Pages 200-201)

◆ Multiple trigger events (including a deliberate contraction of the money supply to curb stock market speculation) led to sharp increase in adverse selection and moral hazard problems.

◆ Resulting breakdown of credit channels caused a sharp contraction in aggregate output and in economic activity in general.

◆ Fall in price level by 25% (1930-1933) led to severe debt deflation which further deepened and prolonged the depression.
What Caused the U.S. Great Depression (1929-1939)... Continued

◆ 1928-1929: Increased Real Interest Rates
   (Tight Monetary Policy to curb excessive stock market speculation by raising real interest rates.)

◆ 1929: Stock Market Crash  (90% loss of value by mid-1932)

◆ 1930-1933: Bank Panics, Increased Uncertainty, Deteriorating Balance Sheets
   – One third of all banks went bankrupt
   – Failure of the Bank of the United States in 1930
   – Sharp decline in aggregate price level (25% drop)
The Subprime Financial Crisis of 2007 – 2011 (Mishkin pp. 201-206)

- Financial innovations in mortgage markets:
  - Subprime mortgages (highest default risk) & Alt-A mortgages (less default risk but still high default risk)
  - Mortgage-backed securities (MBS) based on risky mortgages
  - Collateralized debt obligations (CDOs) based on MBS

- Housing price bubble forms (2002-2006)
  - Increase in liquidity from cash flows surging to U.S.
Subprime Financial Crisis ...

- **Housing price bubble forms (cont’d)**
  - Development of subprime mortgage market fueled housing demand and housing price increases.

- **Agency problems arise**
  - “*Originates to distribute*” approach = Mortgage *originated* by mortgage broker is *distributed* to investors as an underlying asset in a security
    - This approach is subject to principal-agent problems with principal = investor and agent = mortgage broker, because mortgage broker has little incentive to ensure mortgage is a good credit risk
    - Also, borrowers obtaining mortgages had little incentive to disclose information about their ability to pay
Agency problems arise (cont’d)

- Underwriters of mortgage-backed securities and structured credit products (e.g., Collateralized Debt Obligations) based on cash flows of underlying assets had weak incentives to ensure ultimate security holders would be paid off

- Credit-rating agencies had conflicts of interest
  - Advised clients how to structure securities
  - Then rated these same securities
Subprime Financial Crisis ...

- Information problems surface
  - Hard to place values on complicated securities such as CDOs
  - Difficult to determine who owns assets underlying security cash flows
  - Worsened asymmetric information problems in financial markets

- Housing price bubble bursts in 2008
The Subprime Financial Crisis ...

- Crisis spreads globally
  - Sign of financial market globalization
  - TED spread (3 mo. interest rate on Eurodollar minus 3 mo. Treasury bills interest rate) = Interbank market liquidity indicator (cf. Mishkin Fig. 2, p. 204)
  - TED spread increased from 40 basis points to almost 240 in August 2007.
FIGURE 2 (Mishkin, Page 204):
Treasury Bill–to–Eurodollar (TED) Spread

Source: www.federalreserve.gov/releases/h15/data.htm
The Subprime Financial Crisis ...

- Banks’ balance sheets deteriorate
  - Write downs, collapse of CDO values, …
  - Sell-off of assets, credit restrictions, …

- High-profile firms fail
  - Bear Stearns (March 2008)
  - Fannie Mae and Freddie Mac (July 2008)
  - Lehman Brothers, Merrill Lynch, and AIG (2008)
  - Reserve Primary Fund (a mutual fund, 2008)
  - Washington Mutual (September 2008).
The Subprime Financial Crisis ...

- Bailout package debated & passed
    *Includes TARP=Treasury Asset Relief Plan*

- Stimulus package passed
  - Congress approved a $787 billion economic stimulus plan on February 13, 2009 (Obama Administration).
FIGURE 3  Sequence of Events in Emerging Market Financial Crises

STAGE ONE
Initiation of Financial Crisis

- Deterioration in Financial Institutions' Balance Sheets
- Asset Price Decline
- Increase in Interest Rates
- Increase in Uncertainty

STAGE TWO
Currency Crisis

- Fiscal Imbalances
- Adverse Selection and Moral Hazard Problems Worsen
- Foreign Exchange Crisis
- Adverse Selection and Moral Hazard Problems Worsen

STAGE THREE
Full-Fledged Financial Crisis

- Economic Activity Declines
- Banking Crisis
- Adverse Selection and Moral Hazard Problems Worsen
- Economic Activity Declines

Factors Causing Financial Crises
Consequences of Changes in Factors
Stage One: Start of Financial Crises in Emerging Market Economies

- Trigger Path One: Mismanagement of financial liberalization and/or globalization:
  - Elimination of restrictions on financial institutions/markets
  - Financial globalization (permitting foreign capital inflow)
  - Domestic banks borrow from foreign banks at high interest.
  - Exchange rates fixed to USD give a sense of lower risk.

  Weak supervision & lack of expertise

  → lending boom & bust
Stage One: Start of Financial Crises in Emerging Market Economies …

- **Trigger Path Two: Severe fiscal imbalances**
  - Governments in need of funds sometimes force banks to buy government debt.
  - Investors pull out, government debt loses value, the net worth of banks decreases, bank lending ↓, & bank panics can arise.

- **Additional Possible Triggers:**
  - Increase in interest rates abroad that raise home rates
  - Asset price declines (e.g., fall in stock prices)
  - Increased uncertainty arising from instability of political system, prominent firm failures, etc.
Stage 2: Currency Crisis

- Deterioration of bank balance sheets can trigger a currency crisis
  - Government cannot further raise interest rates (doing so forces banks into insolvency)...
  - Speculators sell domestic currency in anticipation of E ↓.

- Severe fiscal imbalance can trigger a currency crisis
  - Foreign and domestic investors sell domestic currency in anticipation of E ↓ in response to higher risk of default on government bonds.
Stage 3: Full-Blown Financial Crisis

- Debt contracts often denominated in foreign currency.

- When E ↓, debt burden in terms of home currency ↑.

- E ↓ results in higher import prices → higher inflation → higher interest rates (Mish 5) → lower borrower cash flows.

- In consequence, banks are more likely to fail:
  - Borrowers from banks less able to pay off their debts (bank assets fall in value).
  - Burden of bank debts denominated in foreign currency increases (bank liabilities increase).

• **Trigger Path One:** Financial liberalization early 1990s
  – Lending boom with weak supervision & lack of expertise
  – Banks accumulated losses & their net worth declined.
• Interest rates ↑ in US led to interest rates ↑ in Mexico
• 1994 uncertainty ↑ (assassination → political instability)
• Domestic currency devaluated on December 20, 1994
• Rise in actual and expected inflation

- **Trigger Path One**: Financial liberalization in early 1990s
  - Lending boom, with weak supervision & lack of expertise.
  - Banks accumulated losses and their net worth declined.

- Uncertainty increased (stock market declines and failure of prominent firms)
- Domestic currencies devaluated by 1997
- Rise in actual and expected inflation

- **Trigger Path Two:** Government coerced banks to absorb large amounts of debt due to fiscal imbalances.
- Interest rates ↑ in US led to interest rates ↑ in Argentina
- Uncertainty increased (ongoing recession)
- Domestic currency devaluated on January 6, 2002
- Rise in actual and expected inflation

- "Global Saving Glut"
  - Before 1994, EM economies were investing more than saving, financed by borrowing from rest of the world.
  - After 1994-2002 crises, EM countries sharply decreased investment & become net lenders to ROW – esp. to US
    - In 1996 EM economies net borrowed $88 billion from ROW.
    - By 2003 EM countries were net lending $205 billion to ROW
  - Capital markets in developed countries awash in savings
  - Contributed to rising stock and housing prices in US