Week 15 Financial Crises

Bond Markets (Lancaster University)

Week 15: Financial Crises

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chapter	Fixed_Income_Analysis_----_(Pg_78--85).pdf

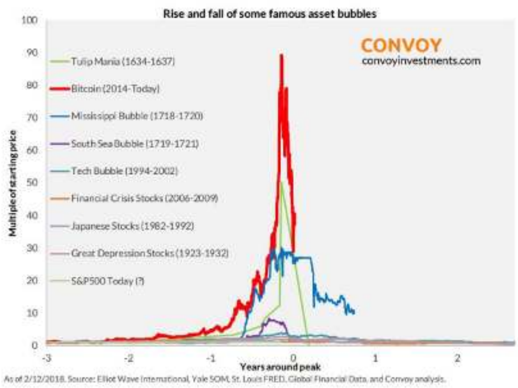
Financial crises are major disruptions in financial markets characterized by sharp declines in asset prices and firm failures. Beginning in August 2007, the U.S. entered into a crisis that was described as a “once-in-a-century credit tsunami.

What is a financial crises?

Asymmetric information creates barriers between savers and firms with productive investment opportunities.

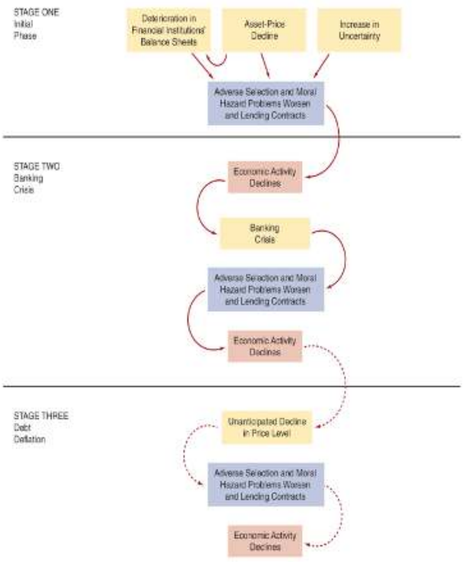
- A financial crisis occurs when information flows in financial markets experience a particularly large disruption. Financial markets may stop functioning completely.

Dynamics of financial crises in advanced economies



financial crises hit countries like United States (Europe, Asia) every so often, and each event helps economists gain insights into that crisis and present-day turmoil

- financial crises hit countries on average every 20-30 years



▼ Stage One: Initial Phase

Financial crisis can begin in several ways:

- credit boom and bust
- asset-price boom and bust
- increase in uncertainty

The seeds of a financial crisis can begin with **mismanagement of financial liberalisation or innovation**:

→ elimination of restrictions (Trump & Dodd Frank)

→ introduction of new types of loans or other financial products (Mortgage Backed Securities, CDS)

→ either can lead to a credit boom, where risk management is lacking

- government safety nets weaken incentives for risk management. Depositors ignore bank risk-taking
- eventually, loan losses accrue, and asset values fall; leading to a reduction in capital
- financial institutions cut back in lending, a process called **deleveraging.** Banking funds fall as well
- As FIs cut back on lending, no one is left to evaluate firms. The financial system losses its primary institutional function to address adverse

selection and moral hazard

- Economic spending contracts as loans become scarce

A financial crisis can also begin with an asset-price boom and bust:

- a pricing bubble starts, where asset value exceed their fundamental values
- when the bubble bursts and prices fall, corporate net worth falls as well. Moral hazard increases as firms have little to lose
- FIs also see a fall in their assets, leading again to deleveraging

A financial crisis can begin with an increase in uncertainty:

- periods of high uncertainty can lead to crises, such as stock market crashes or the failure of a major financial institutions
- moral hazard and adverse selection problems increase, reducing lending and economic activity

▼ Stage Two: Banking Crisis

Deteriorating balance sheets lead financial institutions into insolvency. If severe enough, these factors can lead to a bank panic.

- Panics occur when depositors are unsure which banks are insolvent, causing all depositors to withdraw all funds immediately
- As cash balances fall, FIs must sell assets quickly, further deteriorating their balance sheet
- Adverse selection and moral hazard become severe – it takes years for a full recovery

▼ Stage Three: Debt Deflation

Consider a firm in 2015 with assets of $100 million dollars), $90 million of long-term liabilities, and so $10 million in net worth.

- Price levels fall by 10% in 2016.
- 2016 Assets (e.g. shares, property) value falls to $90 MM
- 2016 Liabilities (e.g. bonds it has issued) remains the same $90 MM
- The firms net worth falls to zero.
- What happens if prices fall 12%?

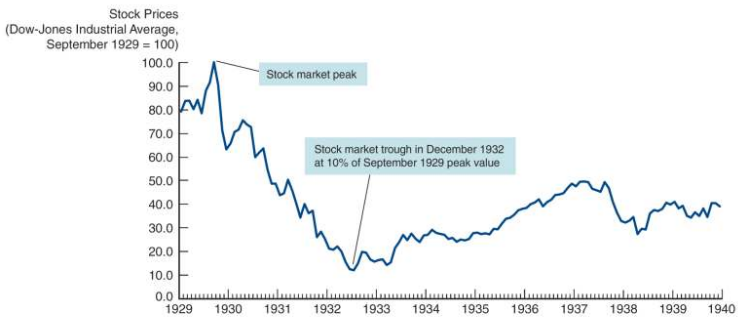
- This is why Central Banks target 2% not Zero inflation!

The Great Depression

In 1928 and 1929, stock prices doubles in the US. The ‘Fed@ tried to curb thus period with excessive speculation with a tight monetary policy (reducing “buying on margin”).

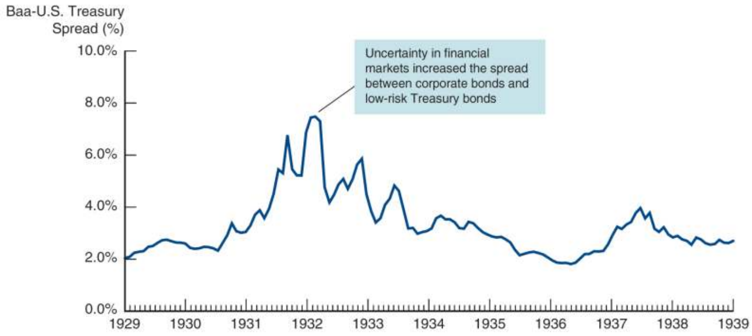
- but this led to a stock market collapse of more than 20% in October 1929, and losing an additional 20% by the end of 1929.

Figure 8.2 Stock Price Data During the Great Depression Period



- severe drought in 1930 in the US Midwest, leading to a sharp decline in agricultural production.
- between 1930 and 1933, one-third of US banks went out of business as these agricultural shocks led to bank failures
- for more than two years, the fed sat idly by through one bank panics after another
- adverse selection and moral hazard in credit markets became severe
- firms with productive uses of funds were unable to get financing
- credit spreads increased from 2% to nearly 8% during the height of the Depression in 1932

Figure 8.3 Credit Spreads During the Great Depression



- the deflation during the period lead to a 25% decline in price levels
- the prolonged economic contraction lead to an unemployment rate around 25%
- the Depression was the worst financial crisis ever in the US — it explains why the economic contraction was also the most severe ever experienced by the nation
- Bank panics in the US spread to the rest of the world, and the contraction of the US economy decreased demand for foreign goods
- the worldwide depression caused great hardship, and the resulting discontent led to rise of fascism and WWII

Mortgage Backed Securities

A detour — US agency mortgage backed securities

Fannie Mae - Federal National Mortgage Association

Freddie Mac - Federal Home Loan Mortgage Corporation

Government agencies - semi-government bonds

> *purpose: reduce the cost of capital (mortgages for house purchases) for sectors of the economy deemed important enough to warrant assistance*

⇒ use mortgage loans they underwrite or purchase as collateral

- mortgage pass-through securities
- collateralized mortgage obligations (CMOs)

Mortgage loan

1. loan secured by the collateral (a real estate property): if not paid, the lender has the right to foreclose/seize the property
2. payments: interest, scheduled principal payment, prepayments
3. prepayments: payments in excess of the required monthly mortgage payment.

⇒ occurs when:

- early sale of the property
- natural disaster followed by insurance payment
- refinancings when interest rates go down

> 💡 Prepayment risk: i.e., If I am a bondholder getting 8% a year interest and
> rates fall to 3% I do not want my 8% bond to be paid back early

Mortgage rate or contract rate: interest rate on the mortgage
Different types of mortgages:

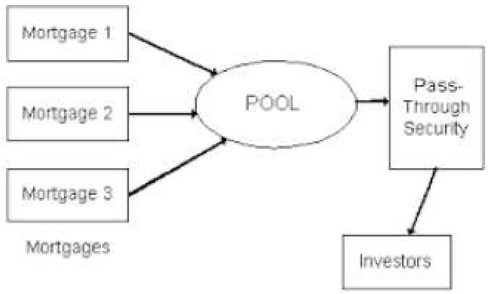
- Traditional fixed-rate fully amortizing
- Floating rate
- Interest-only (fixed or floating)
- Partial amortizing (fixed or floating)

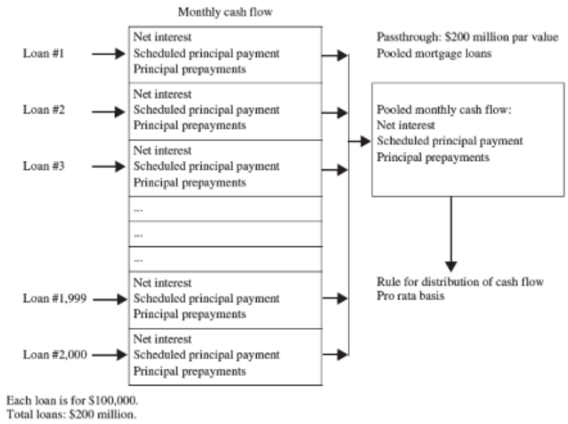
Traditional fixed-rate fully amortizing
My monthly mortgage payment comprises of

- Interest
- Principal repayment

Mortgage Pass-through securities

- Holders (Fannie Mae / Freddie Mac) of the mortgages form a pool of mortgages and sells shares/or participation certificates in the pool





- Holders of the mortgages form a pool of mortgages and sells shares or participation certificates in the pool
- Monthly mortgage payments are passed through to the (bond) certificate holders on a pro rata basis
- When mortgages in the pool are collateralized, the mortgage pool is considered to be securitized
- The exact cash flow amount received by the bond investor is uncertain: depends on the cash flow of the borrowers/mortgage holders in the pool (principal and interest less any servicing fees)
- Looking at 1 individual mortgage the prepayment risk is potentially high. Looking at a pool of 2000 mortgages prepayment risk is reduced.

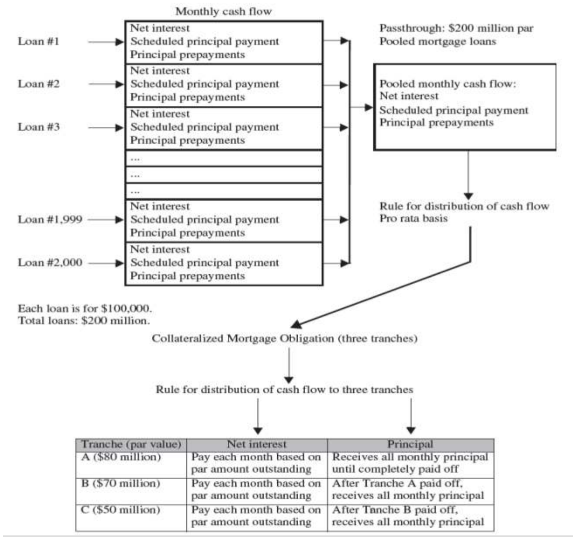
Mortgage pass-through securities versus a 'Normal' coupon bonds

	mortgage pass-through	coupon bonds
principal payments prior to maturity	Yes	No
payments	monthly	annual/semi-annual
payment uncertainty	higher (prepayments)	No

<u>Collateralized Mortage Obligations</u>

⇒ There are rules for the payment of interest and principal (scheduled and prepaid) to the bond classes (tranches) in the CMO

⇒ The purpose of the CMO is to redistribute prepayment risk to different tranches



Collateralized Debt obligations (CDOs)

Significant growth in recent years until the subprime mortgage crisis. Similar to collateralized mortgage obligation (CMO), except that the assets pledged as collateral are:

- Credit Cards
- Domestic and foreign bonds
- Bank loans
- Distressed debt
- Foreign bank loans
- Asset-backed securities
- Commercial and residential mortgage-backed securities

CDOs are packaged to provide unique income streams and risk levels (tranches)

<u>Collateralized Debt Obligations (CDOs) role in the crisis.</u>

- A special purpose vehicle (SPV) is created to buy assets, create securities from those assets, and then sell those securities to investors.
- In a CDO, the securities (or tranches) are created based on default priorities. The first defaults go to the lowest rated tranches. The highest rated tranches only suffer defaults if most of the assets default.

There are many, many tranches in a CDO, each with different exposure to defaults:

- The highest rated tranches are called ***super senior*** tranches
- The next bucket is known as the ***senior*** tranche – it has a little more risk and pays a higher interest rate
- The next tranche is the ***mezzanine*** tranche - it bears more risk and has an even higher interest
- The lowest tranche is the ***equity*** tranche - this is the first tranche that suffers losses from defaults