# Principles of Finance

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What are the similarities of and di, erences between common stock and bonds from the prespective of the investor?

EL Inc. has an expected dividend next year of $5.60 per share, a growth rate of dividends of 10 percent, and a required return on capital of 20 percent. What is the value of a share of EL Inc.'s common stock today?

## The Gordon Growth Model

Intrinsic value of a stock, based on a future series of dividends that grow at a constant rate

$$P_0 = \frac{D_0(1+g)}{(k_e - g)} = \frac{D_1}{(k_e - g)}$$

$D_0$ most recent dividend paid

$g$ expected constant growth rate of dividends

$k_e$ required return on an investment in equity

$$P_0 = \frac{5.60}{(0.20 - 0.10)} = 56.00$$

SC's common stock is expected to pay a dividend of $3.00 forever and currently sells for $21.42. What is the current required rate of return in the market?

## Perpetuity

- A security with no maturity date that pays a dxed amount forever

$$P = \sum_{t=1}^{\infty} \frac{C}{(1+i)^t} = C/i$$

$P$ Price

$C$ yearly payment

$i$ yield to maturity

$$i = C/P$$

$$i = 3/21.42 \approx 0.14$$

True, False, or Uncertain:
SAssuming that economic conditions remain stable, any management action that would cause current and prospective stockholders to raise their dividend expectations should decrease a drm's value.T

Explain.

In early 2006, the yield curve for US bonds indicated a looming recession. Why? What gives the yield curve its predictive power?

Fox corp. has two bonds outstanding that are the same except for the maturity date. Bond D matures in 4 years, while Bond E matures in 7 years. If the required return changes by 5 percent, which bond will have the greater change in its price?

Explain.

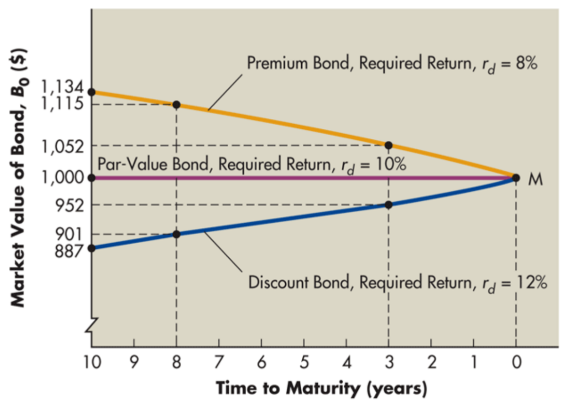
## The Value of a Bond

$$P = \sum_{t=1}^{n} \frac{C}{(1+i)^t} + \frac{F}{(1+t)^n}$$

- $P$ current price
- $C$ coupon payment
- $F$ Face Value (Price at maturity)
- $n$ Time to maturity
- $i$ required rate of return: the current market interest rate

- As required rates of return change, the price of the bond changes, which is the result of Sinterest-rate riskTThus, the greater the investor's required rate of return, the greater will be his/her discount on the bond. Conversely, the less his/her required rate of return below that of the coupon rate, the greater the premium will be.

## Time to Maturity and Bond Values




- The longer the maturity of the bond, the greater the interest rate risk the investor is exposed to, resulting in greater premiums and discounts.

The following statements about bond pricing are always true.

1. Bond prices and market interest rates move in opposite directions.
2. When a bond's coupon rate is (greater than / equal to / less than) the market's required return, the bond's market value will be (greater than / equal to / less than) its par value.
3. Given two bonds identical but for coupon, the price of the lower-coupon bond will change more than that of the higher-coupon bond, for a given change in market interest rates.
4. Given two bonds identical but for maturity, the price of the longer-term bond will change more than that of the shorter-term bond, for a given change in market interest rates.

## Quizzes as Homework

You are encouraged to hand in the solution to the problem sets jointly in groups of up to three students. Every member of the group should be able to explain their solution if asked to do so.

`http://economicscience.net/content/principles-finance-2014`

4th problem set due on January 15th, beginning of lecture.

## Asymmetric Information in Transition and Developing Countries

SFinancial repressionT created by an institutional environment characterized by:

- Poor system of property rights (unable to use collateral ee ciently)
- Poor legal system (die cult for lenders to enforce restrictive covenants)
- Weak accounting standards (less access to good information)
- Government intervention through directed credit programs and state owned banks (less incentive to proper channel funds to its most productive use).

## Financial Development and Economic Growth

- The dnancial systems in developing and transition countries face several die culties that keep them from operating ee ciently
- In many developing countries, the system of property rights
  - the rule of law,
  - constraints on government expropriation,
  - absence of corruption

  functions poorly, making it hard to use the tools to solve asymmetric information problems e, ectively

## What is a Financial Crisis?

A dnancial crisis occurs when there is a particularly large **disruption to information yows in wnancial markets**, with the result that **wnancial frictions increase** sharply and dnancial markets stop functioning

Asset Markets E, ects on Balance Sheets

- Stock market decline:
  Decreases net worth of corporations.
- Unanticipated decline in the price level:
  Liabilities increase in real terms and net worth decreases.
- Unanticipated decline in the value of the domestic currency:
  Increases debt denominated in foreign currencies and decreases net worth.
- Asset write-downs.

## Factors Causing Financial Crises

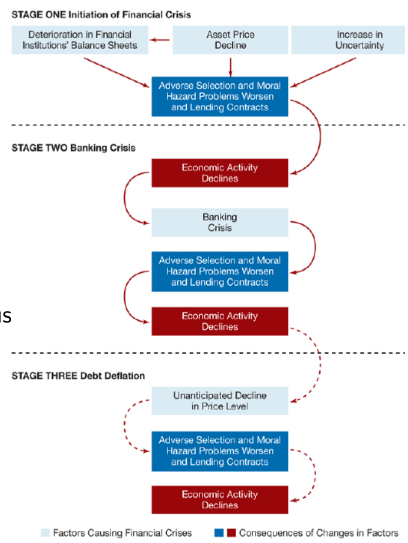
- Deterioration in Financial Institutions' Balance Sheets
  - Decline in lending.
- Banking Crisis
  - Loss of information production and disintermediation.
- Increases in Uncertainty
  - Decrease in lending.
- Increases in Interest Rates
  - Increases adverse selection problem
  - Increases need for external funds and therefore adverse selection and moral hazard.
- Government Fiscal Imbalances
  - Create fears of default on government debt.
  - Investors might pull their money out of the country.

## Dynamics of Financial Crises in Advanced Economies

Stage One: Initiation of Financial Crisis

- Mismanagement of dnancial liberalization/innovation
- Asset price boom and bus
- Spikes in interest rates
- Increase in uncertainty

Stage two: Banking Crisis
Stage three: Debt De$ation



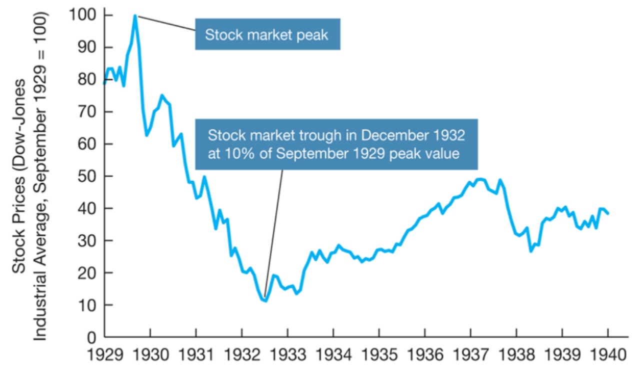
## The Mother of All Financial Crises: The Great Depression

How did a dnancial crisis unfold during the Great Depression and how it led to the worst economic downturn in U.S. history?

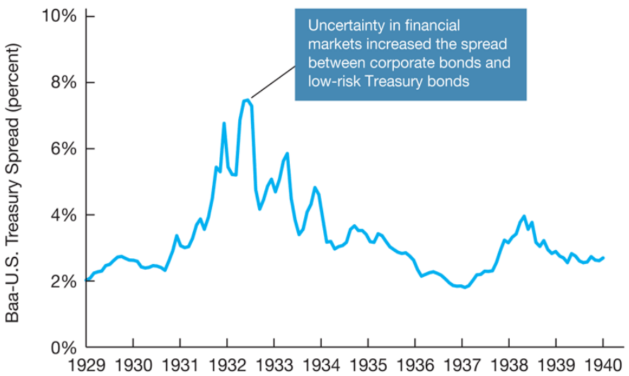
This event was brought on by:

- Stock market crash
- Bank panics
- Continuing decline in stock prices
- Debt de$ation

## Stock Price Data During the Great Depression Period




## Credit Spreads During the Great Depression




## Causes of the Global Financial Crisis 2007: 2009

- Financial innovations emerge in the mortgage markets
  - Subprime and Alt-A mortgages
  - Mortgage-backed securities
  - Collateralized debt obligations (CDOs)

## Collateralized Debt Obligations (CDOs)

- The creation of a collateralized debt obligation involves a corporate entity called a **special purpose vehicle (SPV)** that buys a collection of assets such as
  - corporate bonds and loans,
  - commercial real estate bonds, and
  - mortgage-backed securities
- The SPV separates the payment streams (cash $ows) from these assets into buckets that are referred to as tranches

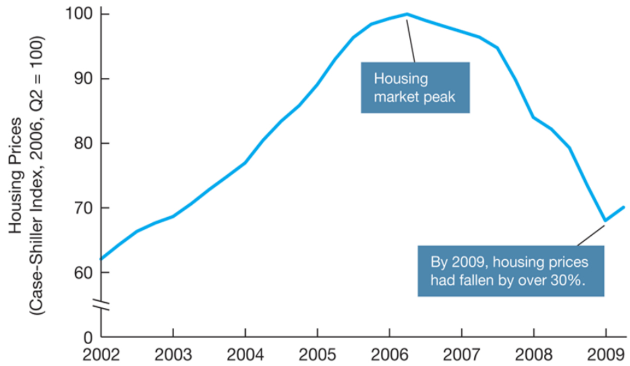
## Collateralized Debt Obligations (CDOs)

- The highest rated tranches, referred to as super **senior tranches** are the ones that are paid o, drst and so have the **least risk**
- The lowest tranche of the CDO is the **equity tranche** and this is the drst set of cash $ows that are not paid out if the underlying assets go into default and stop making payments. This tranche has the **highest risk** and is often not traded

## Causes of the Global Financial Crisis 2007: 2009

- Housing price bubble forms
  - Increase in liquidity from cash f ows surging to the United States Housing price bubble forms
  - Development of subprime mortgage market fueled housing demand and housing prices.
- Agency problems arise
  - SOriginate to distributeT model is subject to principal (investor) agent (mortgage broker) problem.
  - Borrowers had little incentive to disclose information about their ability to pay
  - Commercial and investment banks (as well as rating agencies) had weak incentives to assess the quality of securities
- Information problems surface & Housing bubble bursts

## Housing Prices and the Financial Crisis of 2007 : 2009

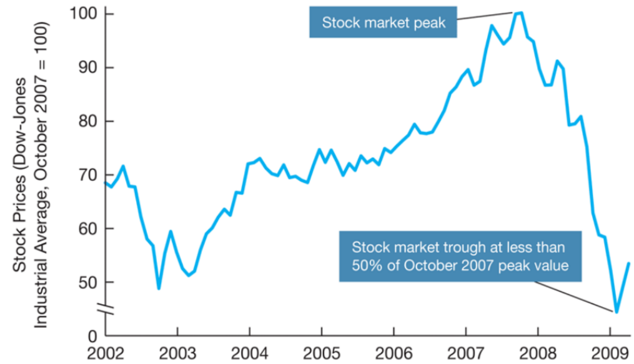



## Global Financial Crisis 2007: 2009

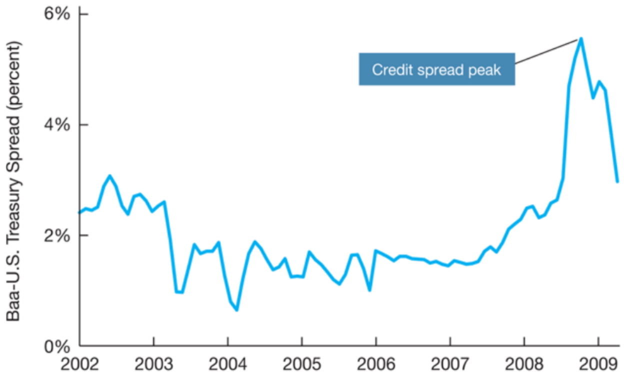
- Crisis spreads globally
  - Sign of the globalization of 8nancial markets
  - TED spread (3 months interest rate on Eurodollar minus 3 months Treasury bills interest rate) increased from 40 basis points to almost 240 in August 2007.
- Banks' balance sheets deteriorate
  - Write downs
  - Sell of assets and credit restriction
- High-prodle drms fail

| | |
|---|---|
| March 2008 | Bear Stearns |
| July 2008 | Fannie Mae and Freddie Mac |
| Sept 2008 | Lehman Brothers, Merrill Lynch, AIG, Reserve Primary Fund (mutual fund) and Washington Mutual |

## Stock Prices and the Financial Crisis of 2007 : 2009




## Credit Spreads and the 2007 : 2009 Financial Crisis




## Global Financial Crisis 2007: 2009

- Bailout package debated
  - US House of Representatives voted down a $700 billion bailout package on September 29, 2008.
  - It passed on October 3.
- Recovery in sight?
  - US Congress approved a $787 billion economic stimulus plan on February 13, 2009.

## Was the Fed to Blame for the Housing Price Bubble?

- Some economists have argued that the low rate interest policies of the Federal Reserve in the 2003 Y 2006 period caused the housing price bubble
- Taylor argues that the low federal funds rate led to low mortgage rates that stimulated housing demand and encouraged the issuance of subprime mortgages, both of which led to rising housing prices and a bubble

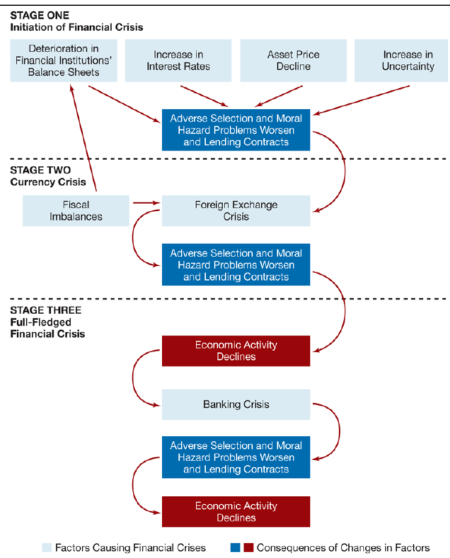
## Was the Fed to Blame for the Housing Price Bubble?

- Federal Reserve Chairman Ben Bernanke countered this argument, saying the culprits were the proliferation of new mortgage products that lowered mortgage payments, a relaxation of lending standards that brought more buyers into the housing market, and capital in$ows from emerging market countries
- The debate over whether monetary policy was to blame for the housing price bubble continues to this day.

## Financial Crises in Emerging Market Economies

Stage one: Initiation of Financial Crisis.

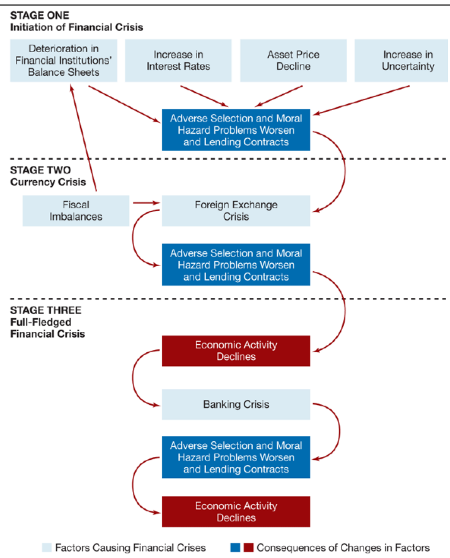
- Path one: mismanagement of dnancial globalization:
  - Weak supervision & lack of expertise leads to a lending boom.
  - Domestic banks borrow from foreign banks.
  - Fixed exchange rates give a sense of lower risk.
  - Banks play a more important role in emerging market economies, since securities markets are not well developed yet.
- Path two: severe dscal imbalances:
  - Governments in need of funds sometimes force banks to buy government debt.
  - When government debt loses value, banks lose and their net worth decreases.
- Additional factors:
  - Increase in interest rates (from abroad)
  - Asset price decrease
  - Uncertainty linked to unstable political systems




## Dynamics of Financial Crises in Emerging Market Economies

Stage two: currency crisis

- Deterioration of bank balance sheets triggers currency crises:
  - Government cannot raise interest rates (doing so forces banks into insolvency) and speculators expect a devaluation.
- How severe dscal imbalances triggers currency crises:
  - Foreign and domestic investors sell the domestic currency.



## Dynamics of Financial Crises in Emerging Market Economies

Stage three: Full-Fledged Financial Crisis:

- The debt burden in terms of domestic currency increases (net worth decreases).
- Increase in expected and actual in$ation reduces drms' cash $ow.
- Banks are more likely to fail:
  - Individuals are less able to pay oe their debts (value of assets fall).
  - Debt denominated in foreign currency increases (value of liabilities increase).

## Financial Crises in Mexico, 1994 :  1995

- Financial liberalization in the early 1990s:
  - Lending boom, coupled with weak supervision and lack of expertise.
  - Banks accumulated losses and their net worth declined.
- Rise in interest rates abroad.
- Uncertainty increased (political instability).
- Domestic currency devaluated on December 20, 1994.
- Rise in actual and expected in$ation.

## Financial Crises in East Asia, 1997 :  1998

- Financial liberalization in the early 1990s:
  - Lending boom, coupled with weak supervision and lack of expertise.
  - Banks accumulated losses and their net worth declined.
- Uncertainty increased (stock market declines and failure of prominent drms).
- Domestic currencies devaluated by 1997.
- Rise in actual and expected in$ation.

## Financial Crises Argentina, 2001 :  2002

- Government coerced banks to absorb large amounts of debt due to dscal imbalances.
- Rise in interest rates abroad.
- Uncertainty increased (ongoing recession).
- Domestic currency devaluated on January 6, 2002
- Rise in actual and expected in$ation.