Ec 136, Financial Economics

Lecture 1

August 27

Outline for today

1. About the course.

2. Financial investments.

3. Returns.

http://econ.berkeley.edu/~szeidl/ec136/ec136index.htm

Readings for this week: BKM Chapters 1-2.

1. This course focuses on questions like

1. How much do stocks earn relative to bonds, and why?

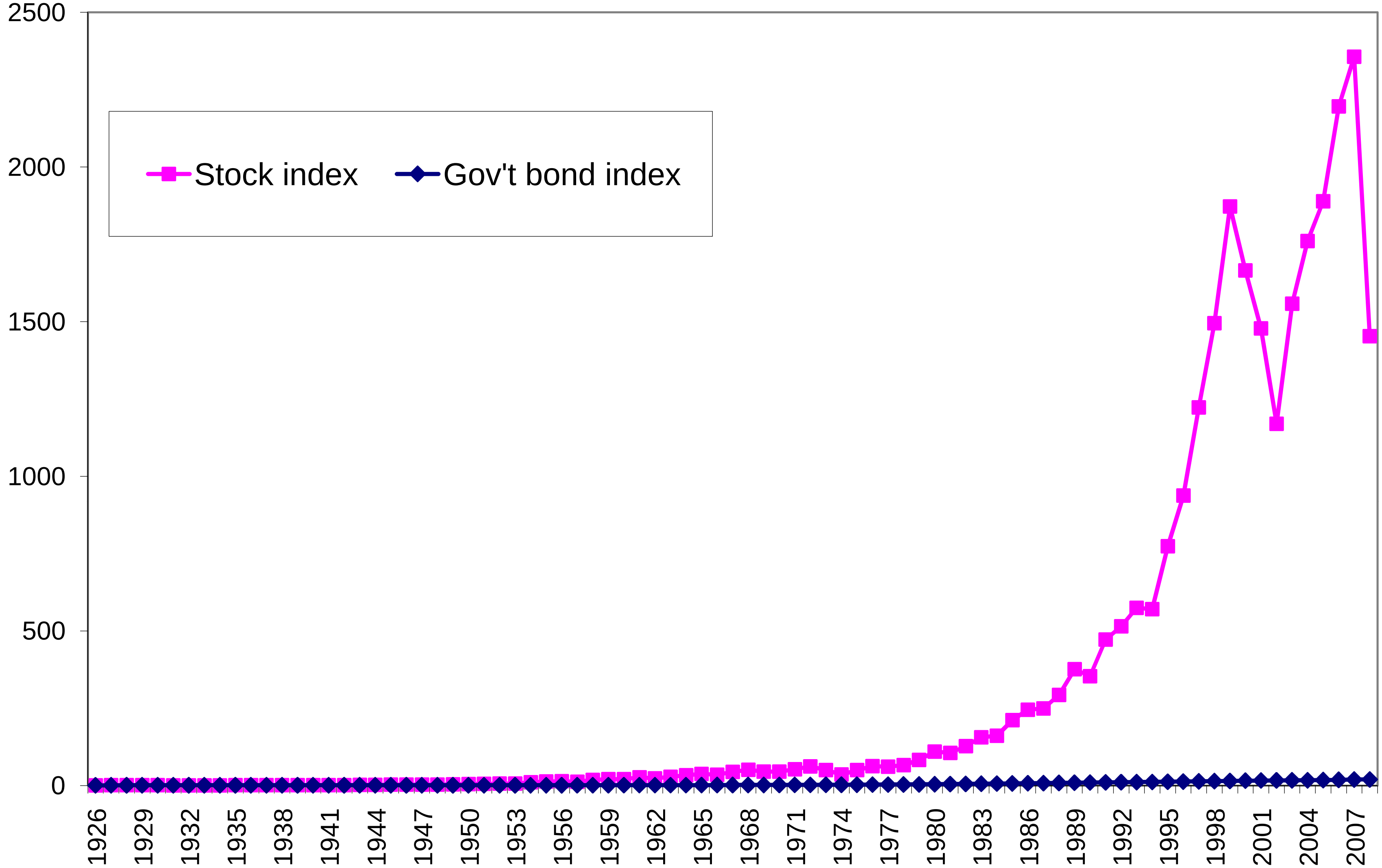
2. Why do some stocks earn higher returns than others?

3. What explains fluctuations in security prices?

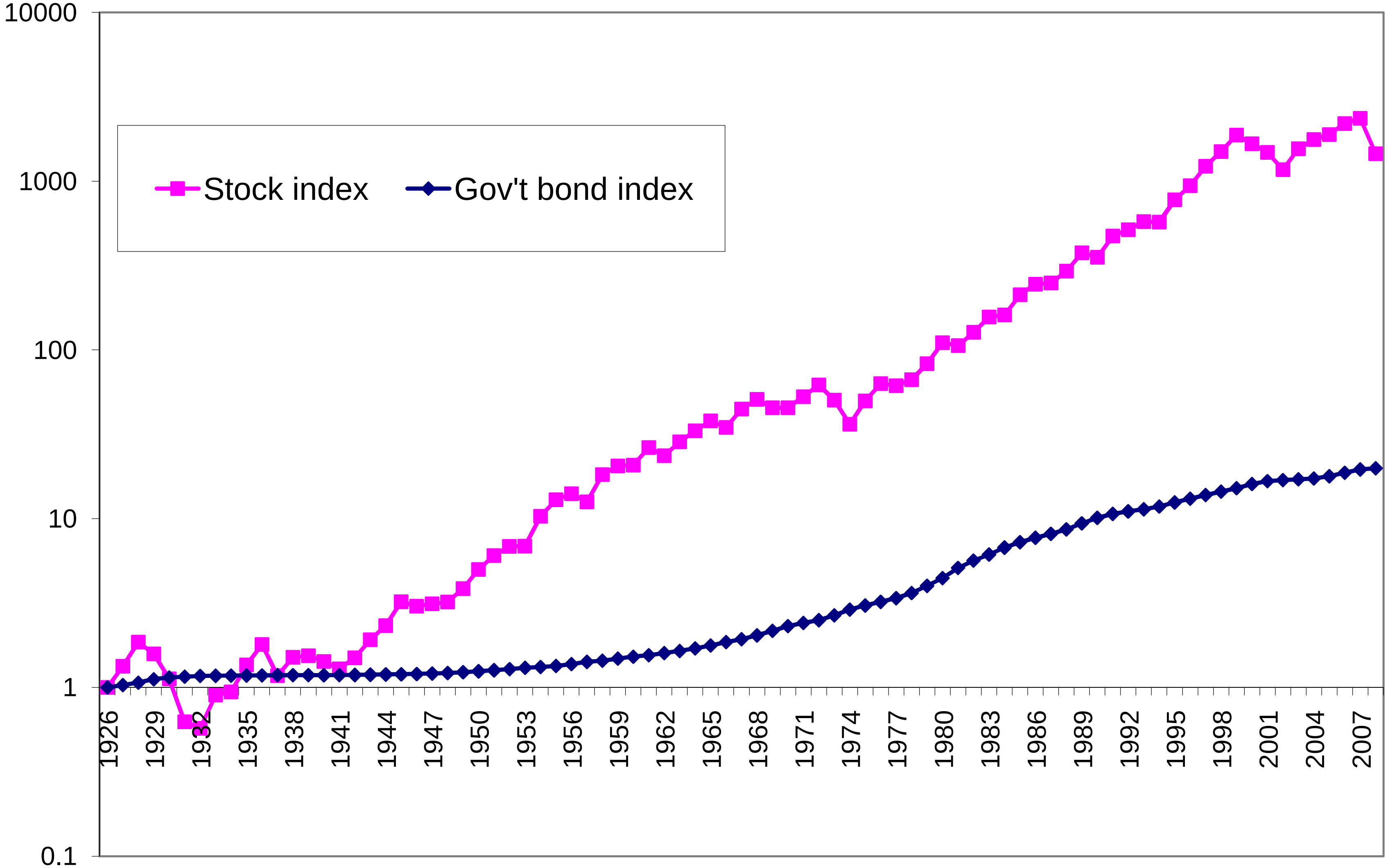
4. How should we invest our financial wealth?

5. What are the uses of derivative securities like options?

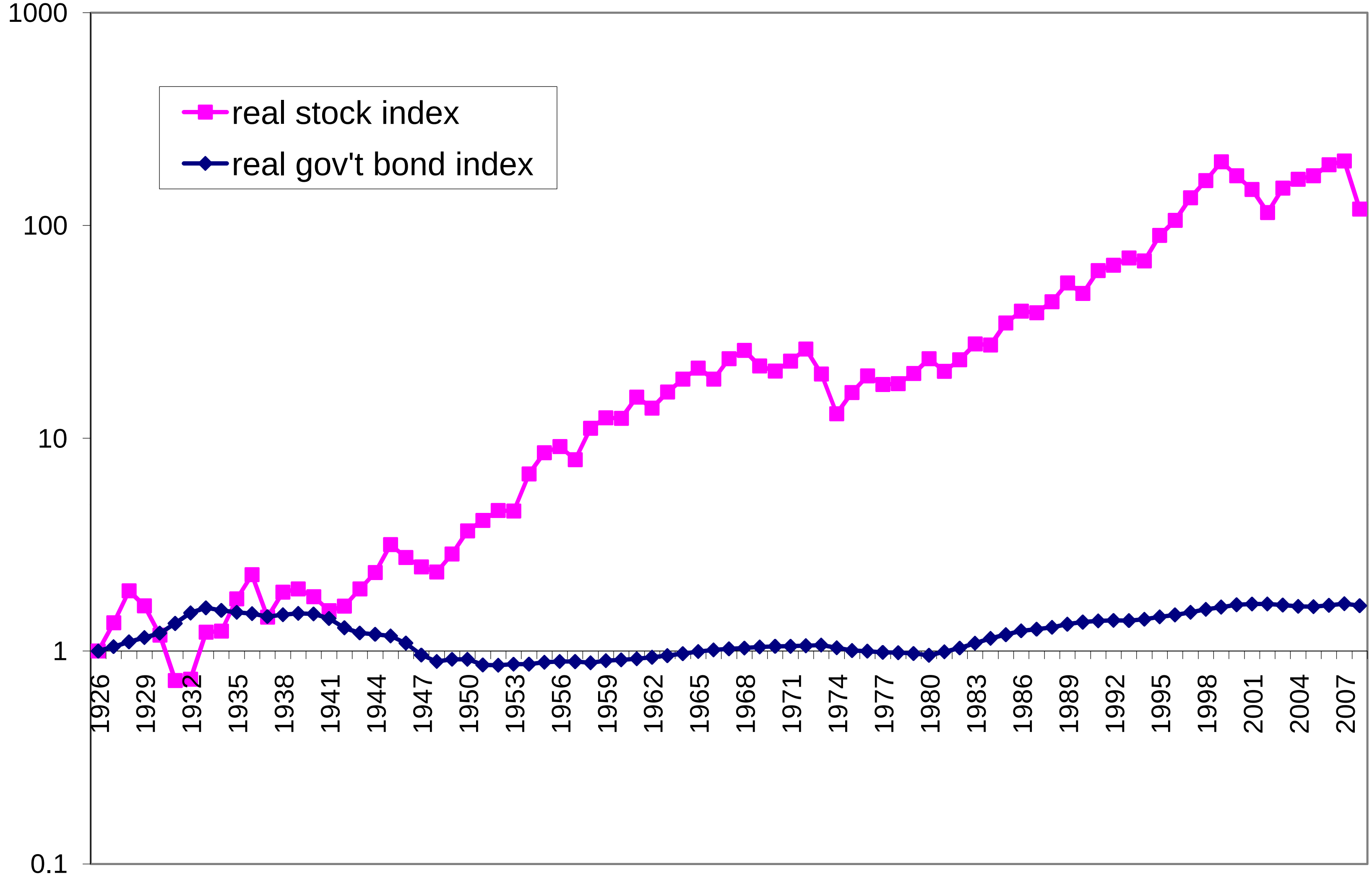
Nominal stock and bond performance 1926-2008



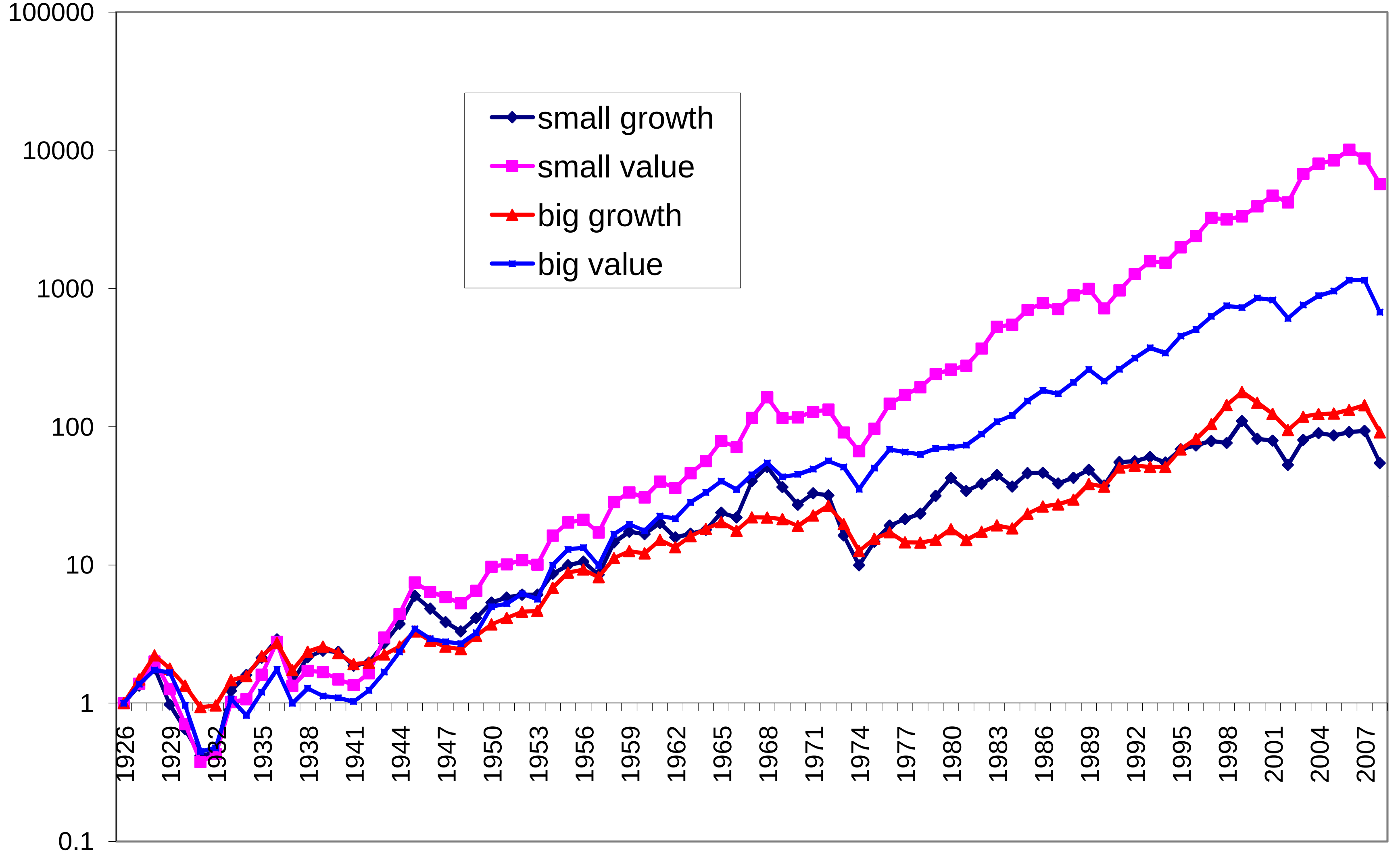
Nominal stock and bond performance, log scale



Real stock and bond performance, log scale



Value and growth portfolios



2. What are stocks and bonds?

- Stocks and bonds are financial investments.

- In general, investments can be

  1. **Real investments**: they require an input of physical resources today and deliver an output of resources tomorrow.

  2. **Financial investments**: claims to the output produced by real investments.

- General point: people with productive ideas are not the same as people with wealth.

- Stocks and bonds allow wealth to be transferred to people with ideas, who can use it productively.

Example

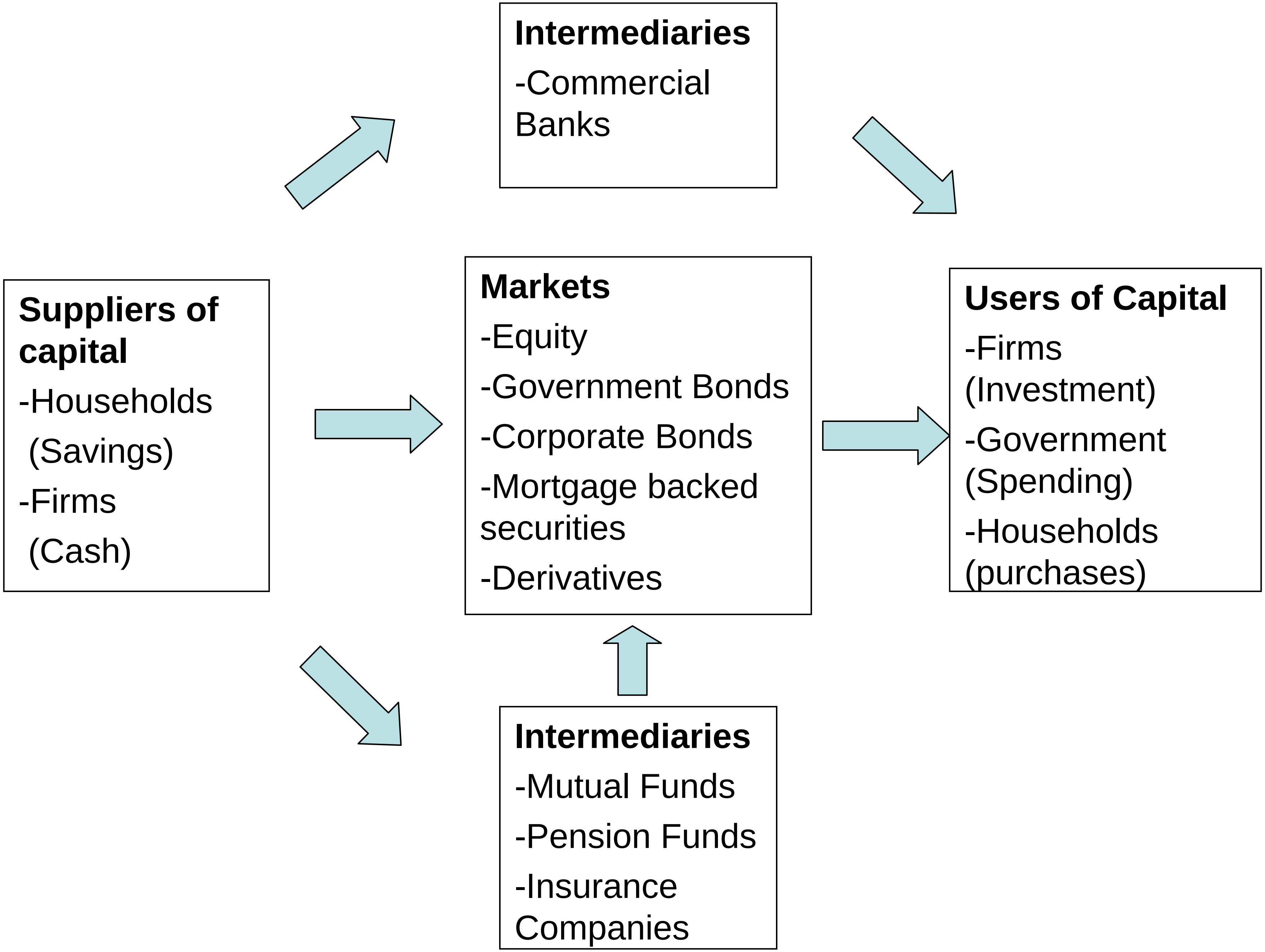
- A company with productive ideas in need of cash issues shares of **stock** to investors.
  - Proceeds used to build factory generating **revenues**.
  - After paying workers and depreciation, company left with **earnings**.
  - Some earnings paid to shareholders as **dividends**.

$$\text{stocks} = \text{ownership.}$$

- Later, to expand, company issues **corporate bonds** that promise fixed payment to bondholders.

$$\text{bonds} = \text{borrowing (debt).}$$

- Stocks and bonds are traded in **financial markets**, where ppl (including you) can purchase them.


Intermediaries
-Commercial Banks
Suppliers of capital
-Households
(Savings)
-Firms
(Cash)
Markets
-Equity
-Government Bonds
-Corporate Bonds
-Mortgage backed securities
-Derivatives
Users of Capital
-Firms (Investment)
-Government (Spending)
-Households (purchases)
Intermediaries
-Mutual Funds
-Pension Funds
-Insurance Companies

3. Returns

- How should we measure the performance of financial investments?

- Let P_t denote the price of a security (e.g., a stock) at time t.

- Let D_{t+1} be the dividend paid by the stock on date $t+1$.

- The **gross simple return** between t and $t+1$ is a measure of how well a security performs:

$$1 + R_{t+1} = \frac{P_{t+1} + D_{t+1}}{P_t}.$$

- Higher returns mean greater earnings per amount invested.

Gross and net return

- Consider the following data for Microsoft:

Price 08/25/2008	Dividends during yr	Price 08/24/2009
\$27.66	\$0.52	\$24.64

- The gross return between August 25, 2008 and August 24, 2009 is

$$\frac{P_{t+1} + D_{t+1}}{P_t} = \frac{24.64 + 0.52}{27.66} = .910$$

- The **net simple return** is

$$R_{t+1} = \frac{P_{t+1} + D_{t+1}}{P_t} - 1$$

- In the example, net return$= -0.09$ or -9%.

Log returns

- The **log return** is the natural logarithm of the gross return:

$$r_{t+1} = \log(1 + R_{t+1}).$$

- A useful property of the natural logarithm is that for small x

$$\log(1 + x) \approx x.$$

- This is demonstrated by the example:

$$\log\text{return} = \log(.910) = -0.095 = -9.5\%.$$

- We will often use log returns in this class (soon it will be clear why).

Multi-period returns

- How should we measure the performance of financial investments over multiple years?

- Answer: gross return between t and $t+2$.

- This is return from holding stock between t and $t+1$, re-invest dividends and hold until $t+2$.

- Formally, the two-period **compound return** is

$$1 + R_{t,t+2} = (1 + R_{t+1}) \cdot (1 + R_{t+2}).$$

- Using log returns, we have

$$r_{t,t+2} = r_{t+1} + r_{t+2}.$$

- E.g., $R_{t+1} = 10\%$ and $R_{t+2} = 20\%$, then
  $R_{t,t+2} = (1{+}0.1){\cdot}(1{+}0.2){-}1 = 1.32{-}1 = 0.32 = 32\%$

Average returns

- What is the average annual return?
- Consider the case where return in year 1 is 30%, while return in year 2 is 0%.
  - What is the two-year return?
- One way of computing average returns is the arithmetic mean:

$$\frac{0\% + 30\%}{2} = 15\%.$$

- Does this mean that earning 15% per year for two years is the same as the above investment?

$$1.15 \cdot 1.15 = 1.3225$$

- No, the above investment earns 30%, while 15% per year earns 32.25%.

Geometric average return

- Because of compounding, calculating the arithmetic average may be misleading.

- Instead, we want a return R such that

$$\begin{aligned}(1+R)(1+R) &= (1+R_{t+1})(1+R_{t+2}) \\ R &= [(1+R_{t+1})(1+R_{t+2})]^{1/2} - 1\end{aligned}$$

- In the example

$$R = [1.3 \times 1.0]^{1/2} - 1 = 14\%.$$

- Log returns are a convenient way to perform the above calculation:

$$r = \frac{r_{t+1} + r_{t+2}}{2}.$$