Mishkin ch.7: Rational Expectations and Efficient markets
(with emphasis on the stock market)

1. Pricing Common Stocks
   - Discounted dividend model. Price = Present value.
   - Monetary policy and stock prices.

2. Rational Expectations
   - Distinguish from adaptive expectations; from perfect foresight

3. Efficient Markets
   - Stock market evidence and practical implications
   - Questions about bubbles

• Other applications:
  - Bond market: Risk and Term Structure
  - Exchange rates
  - Inflationary expectations
Key Concept: Rational Expectations

- **Rational Expectation** = Optimal forecast using all available information
- Remember:
  - Practical version: *Whenever expectations matter, ask how a smart person would interpret the available information.*
  - Rational expectations can be dead wrong – namely if not much information is available. NOT perfect foresight.
  - Application to financial markets:

- **Efficient Markets** = Markets where prices reflect rational expectations.
  - Implies a quick response of equilibrium prices to all relevant news.
  - Implies that existing information is reflected in the price.

- Explains how markets respond to economic reports & policy announcements:
  1. Markets don’t respond when news confirms expectations.
  2. Direction of market responses depends on the difference between the new facts and prior expectations
Fundamentals of Stock Prices

- **One-period valuation**: Price equals discounted price next period + dividend
  - Idea: stocks are priced so expected returns are consistent with market equilibrium.
  - My notation: \( P_{S,t} \) denotes stock price at time \( t \). Required return \( k_e \)

\[
\text{RET} = \frac{D_{t+1}}{P_{S,t}} + \frac{P_{S,t+1} - P_{S,t}}{P_{S,t}} = k_e \quad \Rightarrow \quad P_{S,t} = \frac{1}{1+k_e} (D_{t+1} + P_{S,t+1})
\]

- Inputs needed: expected price next period; dividend; discount rate.
- Discount rate \( \sim \) real interest rate + risk premium.

- **Dividend-discount model**: Apply valuation formula repeatedly.
  - General formula:

\[
P_{S,t} = \sum_{x=1}^{\infty} \frac{D_{t+x}}{(1+k_e)^x}
\]

[Assumes far-ahead prices are discounted enough to be disregarded in the limit]

- Gordon growth model:

\[
P_{S,t} = D_{t} \cdot \sum_{x=1}^{\infty} \frac{(1+g)^x}{(1+k_e)^x} = \frac{D_{t}}{k_e - g}
\]

- Find: Stock prices depend negatively on the discount rate and positively on expected dividend growth
Macroeconomics and Financial Markets

• How do financial markets typically respond to macroeconomic news?
  - Bond prices: sensitive to rates interest rates (negative) & expected inflation (negative).
  - Stock prices: sensitive to earnings (~output, positive) & interest rates (negative).

• Graphical Analysis: output - interest rate diagram
  - Divide into sectors with higher/lower bond & stock prices

- Apply efficient market logic: Initial prices reflect rational expectations about \((r,Y)\).
- Interpret macro news as news about IS, MP, or AS curves. Market impact depends on shifts
  in macroeconomic relationships (curves) relative to expectations.
- Analysis: Combine IS with AD-AS; identify the disturbance => shift relevant curve.

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[Notes on Mishkin Ch.7 - P.4]
Analysis of Macroeconomic News

1. Change in monetary policy ($\bar{r}$) = unexpected shift in the MP curve
   Example: $\bar{r}\downarrow$ $\Rightarrow$ AD right $\Rightarrow$ $Y\uparrow$, $\pi\uparrow$. Along fixed IS curve: $r\downarrow$ $\Rightarrow$ $P_S\uparrow$, $P_B\uparrow$

2. Supply shock ($\rho$) or change in expected inflation ($\pi^e$) = unexpected shift in the AS curve.
   Example: $\rho\uparrow$ $\Rightarrow$ AS left/up $\Rightarrow$ $Y\downarrow$, $\pi\uparrow$. Along fixed IS curve: $r\uparrow$ $\Rightarrow$ $P_S\downarrow$, $P_B\downarrow$

3. Demand shock = unexpected shift in the IS curve.
   Example: $G\uparrow$ $\Rightarrow$ IS right, AD right $\Rightarrow$ $Y\uparrow$, $\pi\uparrow$. Along fixed MP: $r\uparrow$ $\Rightarrow$ $P_B\downarrow$. $P_S=?$
   a) if MP flat (small $\lambda$) $\Rightarrow$ AD steep: $Y\uparrow\uparrow$, $\Delta r$ small. Then $Y\uparrow$ $\Rightarrow$ $P_S\uparrow$.
   b) if MP steep (high $\lambda$) $\Rightarrow$ AD flat: $\Delta Y$ small, $r\uparrow\uparrow$. $\Rightarrow$ Then $r\uparrow$ $\Rightarrow$ $P_S\downarrow$.

• Conclude: Fed has direct impact and it influences the effects of other shocks.

[Notes on Mishkin Ch.7 - P.5]
What explains stock price volatility?

• Mishkin ch.7 comments on crashes, bubbles, and behavioral finance.
  - Controversial. Not only about stocks: many asset markets are volatile – exchange rates, long-term bonds, real estate.

• Broader question: Why are asset prices so volatile?
  1. **Volatile fundamentals**: rational explanation for volatility.
     - News alters expectations about future dividends & about risk (discount rate).
     - No conflict with equilibrium analysis or market efficiency.

  2. **Theory of speculative bubbles**:
     - Claim that market prices can rise **above** fundamentals and then “crash”.
     - Objection: reasonable fears of political risks or market disruption or are too easy to dismiss with hindsight. Bubble = label for ignorance?

  3. **Liquidity crises**: plausible source of crashes but not bubbles.
     - Crash = sudden declines to prices **below** normal fundamentals.
     - Theory: game situations with multiple equilibria.
     - Consider examples …
What goes wrong when markets crash?

• **“Black Monday” - Oct. 19, 1987**
  10/14-10/16: 10% down: 2500 to ~2250
  10/19: 25% down: from 2250 to ~1740
  10/20: AM: market shuts down. PM: recovery.

• **“Flash Crash” – May 6, 2010**
  Dow opens at 10868, declines by ~300 to 2pm.
  2:45PM: Dow drops >600pts within minutes
  Low at 9869.62 – down 998pts (9.2%).
  3:07PM: recovery ~600pts within minutes.
  Close at 10520. Many trades canceled.

• Question about causes: Were there changes in expected return, risk, liquidity?
  - Debatable for Black Monday: pending conflicts about exchange rate policy.
  - Most plausible: trading strategies that rely on others providing liquidity.

• Lessons: Downward-sloping demand matters—trouble if not! Can’t take liquidity for granted.