

Chapter 6 Review Questions

1. Using the models developed in chapters 2 and 3, explain how changes in financial asset prices affect consumption and investment.

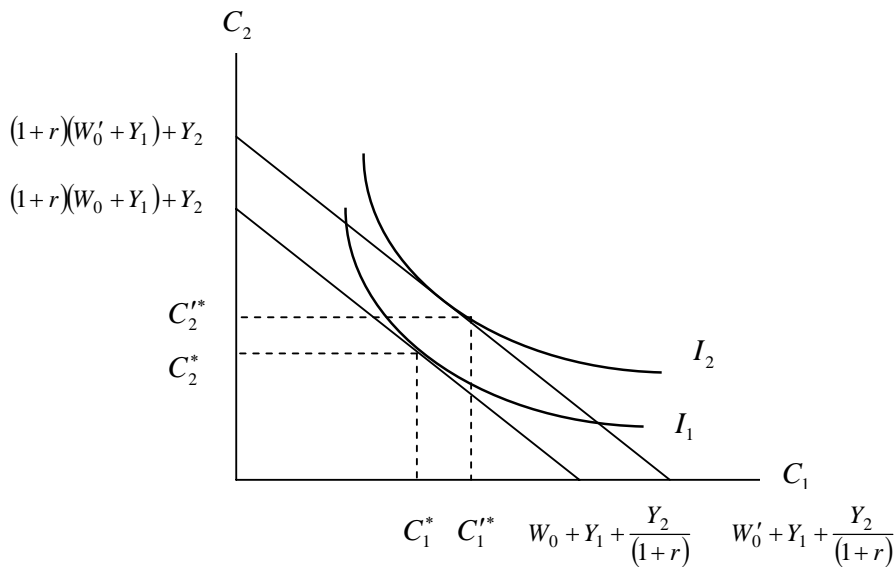
- Stock markets and consumption

The two period optimal consumption model outlined in chapter 2 assumes that a representative household seeks to maximise lifetime utility subject to an intertemporal budget constraint.

$$\text{Max } U(C_1, C_2) \text{ subject to } C_1 + \frac{C_2}{(1+r)} \leq W_0 + Y_1 + \frac{Y_2}{(1+r)}$$

Where W_0 is the initial level of wealth.

The intertemporal budget constraint defines the total resources available for consumption over the lifetime. The household's optimal consumption bundle (C_1^*, C_2^*) is where the indifference curves formed by household preferences form a tangent with the intertemporal budget constraint.



A rise in financial assets prices would be expected to raise wealth levels $W_0 \rightarrow W_0'$ and shift the intertemporal budget constraint outwards reflecting higher lifetime resources. As a result consumption increases to the new consumption bundle (C_1', C_2') .

As the ratio of non-human to human wealth increases it is likely that present consumption might increase due to a fall in precautionary saving. Higher wealth stocks act as a buffer stock against future income uncertainty. Because future consumption is less vulnerable to income shocks there is less need to 'save for a rainy day'.

- Stock markets and investment

The theory of Tobin's q links investment to movements in the stock market.

The value of a company is equal to the present discounted value of the cash flows generated.

$$V_0 = \frac{P.F(K_1)}{(1+r)} + \frac{P.F(K_2)}{(1+r)^2} + \frac{P.F(K_3)}{(1+r)^3} + \dots$$

Where $F(K)$ is firm output for a given level of capital stock and P the price of output. The cost of the firm's initial capital stock is given by $P_K K_0$. Tobin's q is the ratio of these two values.

$$q = \frac{V_0}{P_K K_0}$$

If $q > 1$, then there is some intrinsic factor about the firm that means an increase in its capital stock will raise the value of the firm in excess of the cost of capital. Investment will therefore respond positively with respect to the deviation of q from unity.

$$I = \frac{1}{\theta}(q - 1)$$

Stock markets play a key role here in valuing firms. After all, if the cash flows generated by firms are paid in dividend the firm valuation above would be equivalent to the expected dividend model. If these valuations are efficient, then a rise in stock market values should reflect an improvement in the prospects of firms that warrants an increase in their capital stocks.

2. What effect on stock markets might the following have? Explain your answers.

a. A substantial rise in oil prices

The expected dividend model prices assets according to the expected present discounted value of future dividend payments.

$$P_t = \sum_{i=1}^{\infty} E(D_{t+i} | I_t) / (1+r)^i$$

The Gordon model is a similar representation that relates the price of an asset to the growth in dividend payments g .

$$P_t = \frac{D_{t+1}}{r - g}$$

A substantial rise in oil prices, in general, reduces the productivity of capital reducing the growth rate of future dividend payments so stock prices fall. However, for oil companies there is a rise in the price of the industry's product so expected future profits and dividends would increase- and their share prices would rise.

b. A cut in interest rates

This would raise share prices because future expected dividends are now discounted at a lower rate.

c. A major company announces large profits- but slightly lower than anticipated

It is assumed that stock markets price assets efficiently according to the information available. Therefore, if there is expectations of high profits this information will be absorbed immediately into asset prices. If though profits then turn out to be lower than expected the share price will fall to bring valuations in line with the lower realisation of profits.

d. An accountancy scandal where a firm has overstated its profits

If profits are revised downwards substantially, then expectations of lower future dividends will see the share price of that firm fall considerably.

e. The release of government figures showing strong retail sales growth

A sign of strong domestic demand encouraging future profits and dividend growth will lead to rising asset prices.

f. A report by the central bank showing lower projections of government borrowing

High government borrowing is considered to crowd out investment, because marketing government debt may require higher interest rates on government bonds. Lower borrowing is therefore consistent with lower domestic interest rates. Because future dividends are now discounted at a lower rate asset prices would increase.

g. *A new era of low and stable inflation*

Again, if inflation is anchored at low levels then interest rates are expected to be maintained at low and stable levels, again boosting asset prices. This is because rises in interest rates are not considered necessary in order to control inflation.

3. *Is financial market volatility a sign of efficient or inefficient markets?*

According to the efficient markets hypothesis (EMH) financial assets should be valued according to the expected present discounted value of the earnings of that asset.

$$P_t = \sum_{i=1}^{\infty} E(D_{t+i} | I_t) / (1+r)^i$$

If priced efficiently, then asset prices should constantly change to reflect new information. Because information is always arriving at the market it is not necessarily inefficient for prices to be volatile. In fact, one of the predictions of the EMH is that asset prices will follow a random walk with drift.

$$\Delta P_t = \mu + \varepsilon_t$$

However, there is evidence that asset prices are excessively volatile relative to fundamentals.

$$\text{var}(\Delta P_t) > \text{var}(\varepsilon_t)$$

This would imply that asset prices react not only to news but also noise. Also, some evidence would suggest that

$$\Delta P_t = \beta \Delta P_{t-1} + \varepsilon_t$$

This implies that there is serial correlation in asset price movements, and that past movements in asset prices have predictive power over future movements.

The failure of the EMH may imply that the forces of arbitrage, which are expected to push asset prices towards fundamental values, are in fact weaker than proponents of the EMH would suggest. Although an arbitrage strategy would be expected to deliver long run profits, noise trade risk (traders that base trading strategies on noise) could force prices further away from fundamental values in the short run. If arbitrageurs cannot sustain these early losses to their book values they may be liquidated, or even limit their initial arbitrage position in lieu of this risk.

As a consequence, this enables noise traders to drive the market in the short run and for mis-pricings to persist. In fact, it also enables the market to be governed by waves of optimism and pessimism, and fads and fashions.

Volatility may also arise from bubbles- where a persistent increase in asset prices is driven by the belief that asset prices will rise even further in the future. However, there is a case that bubbles may be consistent with rational behaviour (see the global application on *rational growing bubbles* featured on the companion web site).

Crashes refer to large sudden downward movements in asset prices. These may be justified by market efficiency if the crash represents a collapsing bubble or the arrival of very bad news. However, as the stock market crash in the 1987 shows, large falls in prices may result from the market mechanism and a sudden collapse in liquidity- meaning that asset prices are driven down by far more than fundamentals would suggest.

More advanced problems

4. Why might a firm's share price rise even though it has decided not to distribute profits as dividends to shareholders?

The expected dividend model argues that asset valuations are related to the expected present discounted value of future dividend payments.

$$P_t = \left[E(D_{t+1}|I_t) + E(P_{t+1}|I_t) \right] / (1+r)$$

Therefore, if a firm fails to pay a dividend it might imply that asset valuations should be low. This may not necessarily be the case, because current asset valuations will also reflect future dividend payments.

Suppose there are two identical firms:

Firm 1 one pays an annual dividend

Firm 2 decides not to pay a dividend in the first year but to re-invest the generated cash flows in a one year investment plan.

For firm 1, the current asset price is equal to the expected present discounted value of dividends in the next two years and resale price in two year's time.

$$P_t = \frac{E(D_{t+1}|I_t)}{(1+r)} + \frac{E(D_{t+2}|I_t)}{(1+r)^2} + \frac{E(P_{t+2}|I_t)}{(1+r)^2}$$

For firm 2, $E[D_{t+1}|I_t] = 0$, but this sum is invested in bonds which pays the interest rate r . The return in two period's time is:

$$B_{t+2} = (1+r)E[D_{t+1}|I_t]$$

The expected dividends paid in period two are:

$$E[D_{t+2}|I_t] + (1+r)E[D_{t+1}|I_t].$$

As a result, the asset price of firm 2 is also:

$$P_t = \frac{E(D_{t+1}|I_t)}{(1+r)} + \frac{E(D_{t+2}|I_t)}{(1+r)^2} + \frac{E(P_{t+2}|I_t)}{(1+r)^2}$$

Therefore, it doesn't matter when firms pay dividends. The failure to pay a dividend in one period will not affect the share price if it is simply delayed, but the holders of assets are compensated with interest payments.

Suppose though that firm 2 undertook an investment that yielded returns greater than the interest rate r . In this case, the expected present discounted value of future dividends has increased so asset price would be expected to rise.

Likewise, if the returns on firm 2 investment were less than the interest rate r , then the expected future discounted value of future dividends will be lower and the asset price will fall.

5. What policies could a government implement to reduce the likelihood of:

a. bubbles

A bubble arises when a sustained rise in prices develops a momentum of its own, and prices continue to rise on the basis that further rises are expected. Bubbles though pose risks to the economy and can lead to imbalances and inefficiencies.

First, over-valued share prices may lead to more firm investment than the efficient level. Increased asset wealth might also generate an inflationary expansion in consumer expenditure. It could also lead to an overvalued exchange rate as foreign investors attempt to invest in the bubble. Also, when a bubble inevitably pops, it could lead to a degree of disorderly workout and a recession.

There are two simple policies to try and prevent a bubble from arising.

- Increase interest rates to let the steam out of asset price increases.

- Talk expectations down to try and discourage investors from fuelling the bubble further.

There are however difficulties in attempting to offset a bubble. It is not always possible to differentiate between a bubble and a structural but efficient change in asset price valuations. Also, it is difficult to target interest rates effectively, for example if they are raised too aggressively then the economy may be inadvertently pushed into a slowdown.

b. crashes

Crashes that result from the correct pricing of adverse information, or through the bursting of a bubble are in line with market efficiency so there is a strong argument for the government not to intervene in these cases.

Crashes that arise through investor panic, or through the trading mechanism may lead to large falls in asset prices unconnected to fundamentals. In this case, trading halts (a suspension in trading) that are introduced when prices have fallen by a given amount in a certain period of time may allow a period for the market to stabilise (see the global application box on the web site on circuit breakers). Also, the government could reduce interest rates to support asset prices.