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Hedging and market crashes
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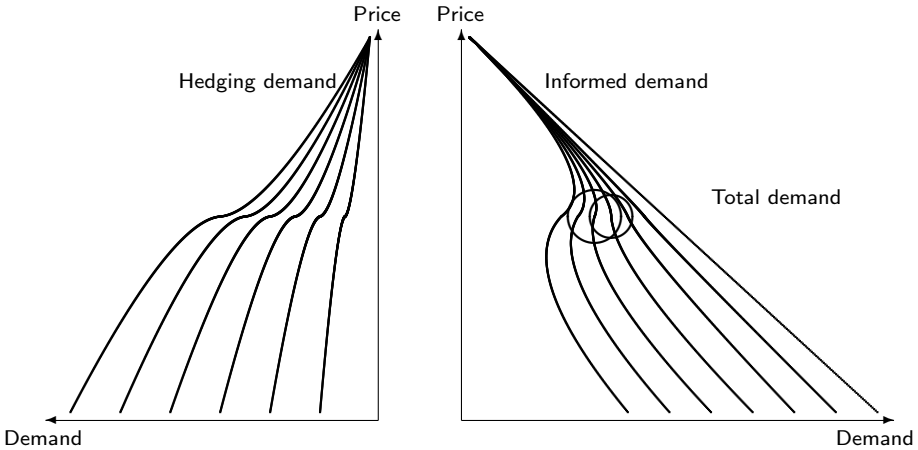
Demand for assets by informed and uninformed investors

- Informed investors will demand more stocks the lower the price is
- If the stock price is high, uninformed investors may want to hedge their exposure
- Uninformed investors would like to participate in any future gains of the asset, but limit losses
- Uninformed investors would buy put options as a hedge
- Such hedges might be entered into at similar times by uninformed investors, which may result in similar strike prices being chosen

Demand for assets from hedging

- The seller of the put option may want to hedge their own exposure to the asset market
- They can do so through Δ-hedging
- The would short-sell $\Delta_P = N(d_1) - 1$ assets for each put option sold
- This creates a negative demand, driven by the Δ_P of the put option
- The higher the demand for put options, the more short-selling occurs
- The amount of short-selling will depend non-linearly on the current price of the asset

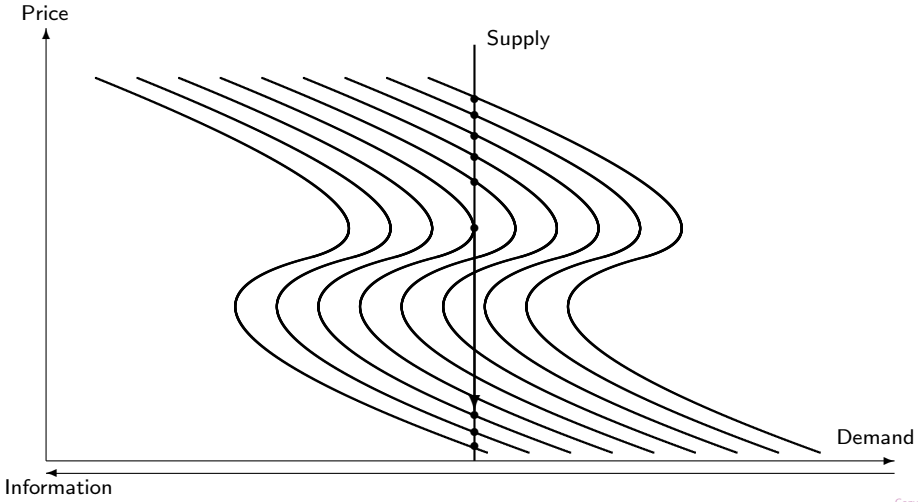
Increasing hedging demand



Backward-sloping demand curve

- The non-linear amount of short-selling can lead to a backward sloping demand curve
- This occurs if the hedging demand by uninformed investors is sufficiently large
- A backward-sloping demand curve has implications for the equilibrium prices

Decreasing informed demand

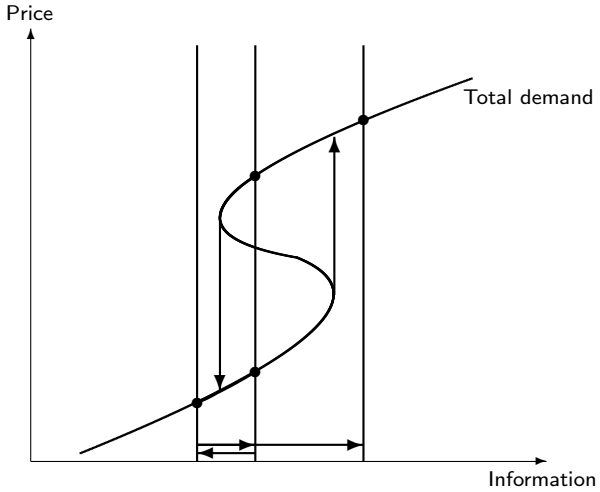


Market crashes can occur

- If the total demand of informed investors is reducing, sudden large price drops can occur
- Such price drops are not the result of significant changes in demand, a small change in demand can lead to a large price change
- As demand increases with information becoming more positive, we can identify the level of demand with information

$\Rightarrow$ A small change in information can cause a market crash

Small changes can have a large impact



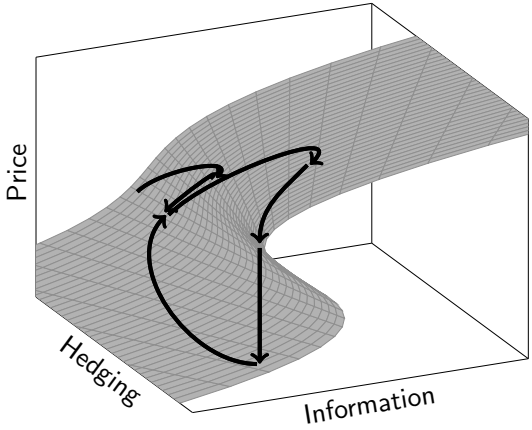
Reversing information

- Reversing the information that lead to a market crash does not lead the price to revert to their old level
- Prices have reached a new lower equilibrium and small improvements in information will only lead to a small increase in prices
- For prices to revert to their previous level, significantly improved information needs to be emerging

Absence of sudden market jumps

- If positive news are received, the demand of informed investors increases, prices increase
- Uninformed investors may be concerned about losses if prices are high due to a bubble and commence hedging
- The higher the price goes, the more hedging is conducted
- If bad information arrives, the demand by informed investors reduces, which may cause a market crash
- After a crash, hedging will reduce as uninformed investors are not concerned about further losses

Dynamics leading to a crash



Hedging demand driving market crashes

- The behaviour of uninformed investors hedging their exposure can lead to market crashes
- If hedging demand is sufficiently high, market crashes can occur without significant information being received
- The run-up the a market crash sees some negative information emerging, but not significant enough to justify a market crash
- The market moves from a high equilibrium to a low equilibrium once the information is sufficiently negative
- Market jumps are unlikely to occur due to the hedging demand being low if the low equilibrium is reached

Market crashes and market jumps

- If the low equilibrium is reached, hedging demand in some markets may still be high
- In the foreign exchange market, investors in one country may see their currency as having low value
- Investors in the other country will then see it as having high value

$\Rightarrow$ Who hedges might change, but high hedging demand may persist

- A market crash from the perspective of one country is a market jump from the perspective the other country
- The same applies in commodity markets with producers and users of the commodity

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