

The Macroeconomics of Imperfect Capital Markets

Anton Korinek

University of Maryland

Lecture 21: Booms, Bubbles, and Crashes III

Bubbles:

- Definition: price of an asset exceeds its fundamental value
- 'Rational' bubbles occur only under 'pathological' circumstances (Santos and Woodford, 1997):

$$PDV(\text{cash flows of all assets}) < PDV(\text{consumption})$$

Bubbles with behavioral traders (Abreu and Brunnermeier, 2003):

- Can persist with lack of common knowledge among arbitrageurs
- This introduces an inability to synchronize arbitrage activities
- Arbitrageurs rationally stay in market to 'ride the bubble'
- Small news events can act as 'synchronizing device'

Bubbles Arising From Agency Problems in Banking Sector

Allen and Gale (Economic Journal, 2000), Bubbles and Crises:

Cycle of bubbles and crises typically goes through 3 phases:

- 1 *expansion in credit inflates bubble*, e.g. due to liberalization
- 2 *bubble bursts*, e.g. b/c of change in monetary policy or in fundamentals
- 3 *defaults, recession, banking crises, and currency crises* ensue

Contributions:

- intermediation in banking sector creates agency problem
- this 'risk shifting' can create asset price bubbles
- credit expansion interacts with risk shifting:
 - increase in investment raises prices of risky assets
 - anticipation of future credit expansion raises prices further
 - shortfall in credit expansion can trigger a crash

Agency Problems in Banking Sector

Investor behavior:

- risk-neutral and born with no net worth
- invest in two different assets (subject to decreasing returns):
 - safe asset: fixed return r
 - risky asset: random return R
- default if net worth becomes negative

Bank behavior:

- supply total amount of loans B
- bank cannot observe investors' investment choices

Problem of risk-shifting:

- investors take advantage of limited liability and over-invest in risky asset
- price of risky asset pushed above fundamental value = **bubble**
- asset value is greater the more (unobservable) uncertainty
- investors earn informational rents

Impact of increase in credit supply:

- more investment in risky asset
- higher price of risky asset → greater bubble

Fundamental property of equilibrium with risk-shifting:

- investors want to take on any (unobservable) risk
- future course of credit supply is uncertain
 - future price of risky asset uncertain
 - another opportunity for speculation
 - even more investment in risky asset
 - even greater bubble

Financial fragility:

- if credit creation is below investors' expectations:
price of risky asset falls below expected value
→ bubble bursts
- this can lead to widespread bankruptcy among investors
- bank capital can be depleted
→ little credit creation next period
→ low asset prices and recession next period

Policy implications:

- financial liberalization creates a lot of uncertainty about the future course of credit supply
- important for central banks and policymakers to consider

Scheinkman and Xiong (Journal of Political Economy, 2003): Overconfidence and Speculative Bubbles

Bubble = option value to sell to another buyer with higher valuation

Two necessary assumptions:

- overconfidence creates disagreement over valuation
- short-sale constraints prevent agents with lower valuation from arbitrage

Explanation for several phenomena during bubble episodes:

- market prices above fundamentals
- high trading volumes
- more disagreement leads to higher price
- transaction costs ('Tobin tax') depress volume, but not price
- subsidiary can be valued more highly than parent

Simple model of overconfidence:

- fundamental value of asset is unobservable
- public signal: current dividend observable to all
- private signal:
 - differs across agents
 - for simplicity: only two different signals across two groups
 - agents overestimate informativeness of private signal
 - agents agree to disagree
- on average agents are neither optimistic nor pessimistic

Implications of Overconfidence

Implications for asset price:

- when there is disagreement, agents with highest valuation buys
→ the more disagreement, the greater the bubble
- short-sale constraint prevents others from pushing down price
- even at moments when all agents happen to agree, option value of future disagreement creates a strictly positive bubble component

Implications for trading volume:

- each time agents' relative valuations cross, there is a trade

Possibility of crashes:

- crashes occur when agents suddenly find agreement, e.g. because:
 - fundamental becomes observable
 - agents correct their overconfidence
- trading volume falls in response

Further Insights of Overconfidence Model

Impact of trading costs:

- agents trade only when disagreement sufficiently large
- reduction in trading volume
- no significant reduction in bubble (i.e. option value)

Valuation of subsidiaries under investor disagreement:

- example in 2000: 3Com owned 95% of Palm, but the market capitalization of Palm was 1.5 times that of 3Com
- imagine parent company owns two subsidiaries:
- assume fundamentals of the two perfectly negatively correlated
- no disagreement about combined market value
- strong disagreements about value of each component
→ bubble/option value for subsidiaries, but not parent