Andreas Krause

Rational herding

The existence of herding

- Generally relying on information should allow traders to make more profits than remaining uninformed
- It is common to find traders herding, suggesting that such behaviour is rational and profitable
- With those herding not relying on information, their uninformed trading should be subject to adverse selection

Revealing asset values

- The value of an asset is revealed publicly either after two rounds of trading or only in the more distant future
- If the value is revealed, the asset trades at that price from round 3 onwards
- If the value is not revealed, the asset will continue to trade at the price of round 2
- The time horizon of any trader extends only to two trading rounds

Informed and uninformed traders

- Traders can decide to become informed at no cost or stay uninformed
- Informed traders learn the value of the asset
- Uninformed traders have no information on the asset value, but will follow a common signal
- This signal has no relation to the asset value, it is uninformative
- Informed traders do not know which signal these traders follow

Processing information and signals

- Trading happens in two rounds and which round a trader chooses is random
- Traders might submit orders at different speeds given their other duties
- The commitment to trade is made in the first round of trading

$\Rightarrow$ The orders submitted in round 1 and round 2 are identical

Price setting

- Prices are set in response to market demand
- If on aggregate traders buy the price increase and if on aggregate they sell the price decreases
- How much this price change is, depends on the amount of informed trading
- Few informed traders will not cause the price to change much for a given net demand
- Many informed traders will cause the price to change much for a given net demand

Losses when revealing asset value

- Uninformed traders will on average make losses if the value is revealed due to adverse selection
- If the value if not revealed, the price does not move after the second round of trading and uninformed traders may make a profit
- If the information is likely to be revealed, uninformed traders expect a loss and will not trade

Emergence of herding

- If the information is not revealed, uninformed traders might make a profit
- This will require that their orders dominate the market against informed traders

⇒ As similar orders are submitted in round 2 as in round 1, the price will continue in a trend

⇒ Traders in round 1 will get a more favourable price and as the price of round 2 remains, can make a profit

- This requires uninformed traders to coordinate their trading on the common signal
- As the signal is not informative, uninformed traders are herding

High fraction of uninformed traders

- Informed traders will trade more aggressively due to having better information than uninformed traders
- This requires many more uninformed traders than informed traders to dominate the market
- If there are less informed traders, their profits will be higher as they can exploit their informational advantage better
- This will strike a balance in the number of traders who become informed, but not all traders will be uninformed

Low probability of information revelation

- Uninformed traders realise their profits if the information is not revealed
- For profits from herding to be sufficiently high compared to becoming informed, information must not be revealed too often

$\Rightarrow$ Herding is feasible if the information is unlikely to be revealed

Profitable herding

- Herding allows uninformed traders to induce a trend into the market that they can benefit from if they enter the market early
- Herding can be more profitable to traders than informed trading, even if information is free
- In equilibrium we will need a large fraction of herders in the market

Conditions for herding

- Herding is profitable if information is unlikely to be revealed and sufficient numbers of traders coordinate in the herd
- The price in such a market can deviate from the value implied by available information
- It can be rational for traders to ignore information they have and join the herding

Andreas Krause
Department of Economics
University of Bath
Claverton Down
Bath BA2 7AY
United Kingdom

E-mail: `mnsak@bath.ac.uk`