Trading Frenzies and Their Impact on Real Investment

Discussant: Alessandro Pavan

Northwestern University

April 1, 2010
Contribution/results

- Effects of **informational spillovers** (from **financial mkt** to **real sector**) on use of information, price informativeness, and volatility

Possible destabilizing effect
Mechanism: informed speculators
- price signal of productivity
- investment (by capital providers)

Informational spillover to real sector affects the degree of complementarity/substitutability in traders' investment decisions
- sensitivity of traders' behavior to various sources of information
- response of the price to different noise shocks
- information available to capital provider(s)

Normative result: traders either coordinate too much (when mkt liquidity is low) or too little (when mkt volatility is high)

Policy prescriptions: (state contingent) policies that subsidize real investment or affect mkt liquidity can increase welfare
Contribution/results

- Effects of informational spillovers (from financial mkt to real sector) on use of information, price informativeness, and volatility

- Possible destabilizing effect
Contribution/results

- Effects of informational spillovers (from financial mkt to real sector) on use of information, price informativeness, and volatility

- Possible destabilizing effect

- Mechanism: informed speculators $\rightarrow$ price $\rightarrow$ signal of productivity $\rightarrow$ investment (by capital providers)
Contribution/results

- Effects of informational spillovers (from financial mkt to real sector) on use of information, price informativeness, and volatility

- Possible destabilizing effect

- Mechanism: informed speculators → price → signal of productivity → investment (by capital providers)

- Informational spillover to real sector affects the degree of complementarity/substitutability in traders' investment decisions → sensitivity of traders' behavior to various sources of information → response of the price to different noise shocks → information available to capital provider(s)
Contribution/results

- Effects of informational spillovers (from financial mkt to real sector) on use of information, price informativeness, and volatility

- Possible destabilizing effect

- Mechanism: informed speculators → price → signal of productivity → investment (by capital providers)

- Informational spillover to real sector affects the degree of complementarity/substitutability in traders’ investment decisions → sensitivity of traders’ behavior to various sources of information → response of the price to different noise shocks → information available to capital provider(s)

- Normative result: traders either coordinate too much (when mkt liquidity is low) or too little (when mkt volatility is high)
Contribution/results

- Effects of **informational spillovers** (from **financial mkt** to **real sector**) on use of information, price informativeness, and volatility

- Possible destabilizing effect

- Mechanism: informed speculators → price → signal of productivity → investment (by capital providers)

- Informational spillover to real sector affects the degree of **complementarity/substitutability** in traders' investment decisions → sensitivity of traders' behavior to various sources of information → response of the price to different noise shocks → information available to capital provider(s)

- Normative result: traders either coordinate too much (when mkt liquidity is low) or too little (when mkt volatility is high)

- Policy prescriptions: (state contingent) policies that subsidize real investment or affect mkt liquidity can increase welfare
Origin of inefficiency

- Information externality
Origin of inefficiency

- Information externality

- Traders do not internalize effect of their collective behavior on informativeness of the price (i.e., on the quality of the information they pass to real sector)

Related idea: herding literature (paper needs to explain relation better)
Origin of inefficiency

- Information externality

- Traders do not internalize effect of their collective behavior on informativeness of the price (i.e., on the quality of the information they pass to real sector)

- Related idea: herding literature (paper needs to explain relation better)
Observations/comments

- Important point
Observations/comments

- Important point

- Result that traders do not internalize information externality is robust
Important point

Result that traders do not internalize *information externality* is robust

Possibility of inefficiently low coordination less so...
Observations/comments

- Same model, but

\[
U_i = (F \cdot I - P) x_i - \frac{1}{2} x_i^2
\]

\[
x_i \in \mathbb{R}
\]

\[
Q^s = \xi
\]
Observations/comments

- Same model, but

\[ U_i = (F \cdot I - P)x_i - \frac{1}{2}x_i^2 \]

\[ x_i \in \mathbb{R} \]

\[ Q^s = \xi \]

- Mkt clearing price

\[ P = \int_i \mathbb{E}_i[\tilde{F}]di - \xi \]
Observations/comments

- Same model, but

\[ U_i = (F \cdot I - P) x_i - \frac{1}{2} x_i^2 \]
\[ x_i \in \mathbb{R} \]
\[ Q^s = \xi \]

- Mkt clearing price

\[ P = \int_i \mathbb{E}_i [\tilde{F}] di - \xi \]

- Informativeness of the price maximized at \( x_i = \beta s_i \) with \( \beta \to +\infty \)
Observations/comments

- Same model, but
  \[ U_i = (F \cdot I - P) x_i - \frac{1}{2} x_i^2 \]
  \[ x_i \in \mathbb{R} \]
  \[ Q^s = \xi \]

- Mkt clearing price
  \[ P = \int_i \mathbb{E}_i[\tilde{F}] di - \xi \]

- Informativeness of the price maximized at \( x_i = \beta s_i \) with \( \beta \to +\infty \)

- Never under sensitivity to correlated noise
Observations/comments

- Better discussion of role of certain assumptions (e.g., specific form of stochastic supply, borrowing constraints, role of bang-bang solutions, market orders, etc.)
Observations/comments

- Better discussion of role of certain assumptions (e.g., specific form of stochastic supply, borrowing constraints, role of bang-bang solutions, market orders, etc.)

- Positive effect of coordination on price informativeness: more discussion (robustness??)
Observations/comments

- Better discussion of role of certain assumptions (e.g., specific form of stochastic supply, borrowing constraints, role of bang-bang solutions, market orders, etc.)

- Positive effect of coordination on price informativeness: more discussion (robustness??)

- REE: Allow traders to condition on information revealed by $P$
Observations/comments

- Better discussion of role of certain assumptions (e.g., specific form of stochastic supply, borrowing constraints, role of bang-bang solutions, market orders, etc.)

- Positive effect of coordination on price informativeness: more discussion (robustness??)

- REE: Allow traders to condition on information revealed by $P$

- Variance of noisy supply $\approx$ mkt liquidity?
Observations/comments

- Better discussion of role of certain assumptions (e.g., specific form of stochastic supply, borrowing constraints, role of bang-bang solutions, market orders, etc.)

- Positive effect of coordination on price informativeness: more discussion (robustness??)

- REE: Allow traders to condition on information revealed by $P$

- Variance of noisy supply $\approx$ mkt liquidity?

- Policy analysis requires some work
  - bringing $k^*$ closer to $k_{OP}$ does not imply higher welfare (moving across $\neq$ economies).
  - (a) state-contingent tax/subsidies change payoffs
  - (b) liquidity provision affects price informativeness (for given $k$)
Observations/comments

- Better discussion of role of certain assumptions (e.g., specific form of stochastic supply, borrowing constraints, role of bang-bang solutions, market orders, etc.)

- Positive effect of coordination on price informativeness: more discussion (robustness??)

- REE: Allow traders to condition on information revealed by $P$

- Variance of noisy supply $\approx$ mkt liquidity?

- Policy analysis requires some work
  $\rightarrow$ bringing $k^*$ closer to $k_{OP}$ does not imply higher welfare (moving across $\neq$ economies).
    (a) state-contingent tax/subsidies change payoffs
    (b) liquidity provision affects price informativeness (for given $k$)

- Idea that gov’t should increase liquidity (increase variance of noisy supply) to increase price-informativeness does not sound convincing
Comment that releasing more precise public information unambiguously increases welfare relies on assumption that there is too much coordination; interesting because this is precisely when in other models public information has been shown to have potentially detrimental effects.
Comment that releasing more precise public information unambiguously increases welfare relies on assumption that there is too much coordination; interesting because this is precisely when in other models public information has been shown to have potentially detrimental effects.

Not clear how to implement interventions that affect information available to the speculators but not to capital providers.
Observations/comments

- Comment that releasing more precise public information unambiguously increases welfare relies on assumption that there is too much coordination; interesting because this is precisely when in other models public information has been shown to have potentially detrimental effects.

- Not clear how to implement interventions that affect information available to the speculators but not to capital providers.

- Benchmark with no learning: not very useful (CP does not learn from $P$, yet her information is not a SS for $P$; naivete).
Observations/comments

- Comment that releasing more precise public information unambiguously increases welfare relies on assumption that there is too much coordination; interesting because this is precisely when in other models public information has been shown to have potentially detrimental effects.

- Not clear how to implement interventions that affect information available to the speculators but not to capital providers.

- Benchmark with no learning: not very useful (CP does not learn from $P$, yet her information is not a SS for $P$; naivete).

- Positive and Normative effects of spillovers difficult to appreciate (in the absence of information spillovers, traders' behavior totally irrelevant for welfare; destabilizing effect of spillovers → relative to which benchmark?)
Observations/comments

- Comment that releasing more precise public information unambiguously increases welfare relies on assumption that there is too much coordination; interesting because this is precisely when in other models public information has been shown to have potentially detrimental effects.

- Not clear how to implement interventions that affect information available to the speculators but not to capital providers.

- Benchmark with no learning: not very useful (CP does not learn from $P$, yet her information is not a SS for $P$; naivete).

- Positive and Normative effects of spillovers difficult to appreciate (in the absence of information spillovers, traders' behavior totally irrelevant for welfare; destabilizing effect of spillovers $\rightarrow$ relative to which benchmark?)

- Advantage/appropriateness of bang-bang solution (threshold strategies)
  (i) OK in games of regime change
  (ii) less so in speculative trading.
Observations/comments

- Comment that releasing more precise public information unambiguously increases welfare relies on assumption that there is too much coordination; interesting because this is precisely when in other models public information has been shown to have potentially detrimental effects.

- Not clear how to implement interventions that affect information available to the speculators but not to capital providers.

- Benchmark with no learning: not very useful (CP does not learn from $P$, yet her information is not a SS for $P$; naivete).

- Positive and Normative effects of spillovers difficult to appreciate (in the absence of information spillovers, traders' behavior totally irrelevant for welfare; destabilizing effect of spillovers $\rightarrow$ relative to which benchmark?)

- Advantage/appropriateness of bang-bang solution (threshold strategies) (i) OK in games of regime change (ii) less so in speculative trading.

- Better discussion of related literature / contribution.
Observations/comments

- Comment that releasing more precise public information unambiguously increases welfare relies on assumption that there is too much coordination; interesting because this is precisely when in other models public information has been shown to have potentially detrimental effects.

- Not clear how to implement interventions that affect information available to the speculators but not to capital providers.

- Benchmark with no learning: not very useful (CP does not learn from $P$, yet her information is not a SS for $P$; naivete).

- Positive and Normative effects of spillovers difficult to appreciate (in the absence of information spillovers, traders’ behavior totally irrelevant for welfare; destabilizing effect of spillovers $\rightarrow$ relative to which benchmark?)

- Advantage/appropriateness of bang-bang solution (threshold strategies)
  (i) OK in games of regime change
  (ii) less so in speculative trading

- Better discussion of related literature / contribution
  - macro/finance applications of herding literature
Observations/comments

- Comment that releasing more precise public information unambiguously increases welfare relies on assumption that there is too much coordination; interesting because this is precisely when in other models public information has been shown to have potentially detrimental effects.

- Not clear how to implement interventions that affect information available to the speculators but not to capital providers.

- Benchmark with no learning: not very useful (CP does not learn from $P$, yet her information is not a SS for $P$; naivete).

- Positive and Normative effects of spillovers difficult to appreciate (in the absence of information spillovers, traders' behavior totally irrelevant for welfare; destabilizing effect of spillovers $\rightarrow$ relative to which benchmark?)

- Advantage/appropriateness of bang-bang solution (threshold strategies)
  (i) OK in games of regime change
  (ii) less so in speculative trading

- Better discussion of related literature / contribution
  - macro/finance applications of herding literature
  - policy with dispersed information (AP 2009, Lorenzoni 2009, ...)

- [Other points or comments as needed]
Observations/comments

- Comment that releasing more precise public information unambiguously increases welfare relies on assumption that there is too much coordination; interesting because this is precisely when in other models public information has been shown to have potentially detrimental effects.

- Not clear how to implement interventions that affect information available to the speculators but not to capital providers.

- Benchmark with no learning: not very useful (CP does not learn from $P$, yet her information is not a SS for $P$; naivete).

- Positive and Normative effects of spillovers difficult to appreciate (in the absence of information spillovers, traders' behavior totally irrelevant for welfare; destabilizing effect of spillovers $\rightarrow$ relative to which benchmark?)

- Advantage/appropriateness of bang-bang solution (threshold strategies)
  (i) OK in games of regime change
  (ii) less so in speculative trading

- Better discussion of related literature / contribution
  - macro/finance applications of herding literature
  - policy with dispersed information (AP 2009, Lorenzoni 2009,...)
  - effect of complementarities on use of information (not only value): MS 2002, AP 2009
Relation to Angeletos-Lorenzoni-Pavan

- Similar in spirit, but opposite direction of informational spillovers:
Relation to Angeletos-Lorenzoni-Pavan

- Similar in spirit, but opposite direction of informational spillovers:

- This paper: from financial mkt to real sector
Relation to Angeletos-Lorenzoni-Pavan

- Similar in spirit, but opposite direction of informational spillovers:
  - This paper: from financial mkt to real sector
  - Our paper: from real sector to financial mkt
Relation to Angeletos-Lorenzoni-Pavan

- Similar in spirit, but opposite direction of informational spillovers:
  - This paper: from financial mkt to real sector
  - Our paper: from real sector to financial mkt

- Similarities: in both papers spillovers create an endogenous coordination incentive
  - Inefficiency in this paper originates in information externality (as in herding literature)
  - In ALP: inefficiency originates in response of investment to various sources of information
Relation to Angeletos-Lorenzoni-Pavan

- Similar in spirit, but opposite direction of informational spillovers:

  - This paper: from financial mkt to real sector

  - Our paper: from real sector to financial mkt

- Similarities: in both papers spillovers create an endogenous coordination incentive

- Differences: inefficiency in this paper originates in information externality (as in herding literature)

  In ALP: inefficiency originates in response of investment to various sources of information
two types of agents, “entrepreneurs” and “traders”
two types of agents, “entrepreneurs” and “traders”

- $t = 0$: arrival of new technology of unknown productivity $F$
- $t = 1$: entrepreneurs decide investment in new technology based on various sources of information
- $t = 2$: fraction of entrepreneurs sell to traders
- $t = 3$: productivity $F$ revealed and payoffs realized
two types of agents, “entrepreneurs” and “traders”

$t = 0$: arrival of new technology of unknown productivity $F$

$t = 1$: entrepreneurs decide investment in new technology based on various sources of information
Angeletos-Lorenzoni-Pavan

- two types of agents, “entrepreneurs” and “traders”

- $t = 0$: arrival of new technology of unknown productivity $F$

- $t = 1$: entrepreneurs decide investment in new technology based on various sources of information

- $t = 2$: fraction $\lambda$ of entrepreneurs sell to traders
two types of agents, “entrepreneurs” and “traders”

$t = 0$: arrival of new technology of unknown productivity $F$

$t = 1$: entrepreneurs decide investment in new technology based on various sources of information

$t = 2$: fraction $\lambda$ of entrepreneurs sell to traders

$t = 3$: productivity $F$ revealed and payoffs realized
High aggregate investment ($K$) is good news for profitability.
High aggregate investment ($K$) is good news for profitability

Traders cannot tell whether high $K$ is driven by high profitability or correlated error in entrepreneurs’ information
High aggregate investment ($K$) is good news for profitability

Traders cannot tell whether high $K$ is driven by high profitability or correlated error in entrepreneurs’ information

Entrepreneurs anticipate effect of $K$ on $P$ (collective signaling game)
- High aggregate investment \((K)\) is good news for profitability
- Traders cannot tell whether high \(K\) is driven by high profitability or correlated error in entrepreneurs’ information
- Entrepreneurs anticipate effect of \(K\) on \(P\) (collective signaling game)
- Mispricing \((F - P)\) predictable (in part) by entrepreneurs
High aggregate investment \((K)\) is good news for profitability

Traders cannot tell whether high \(K\) is driven by high profitability or correlated error in entrepreneurs’ information

Entrepreneurs anticipate effect of \(K\) on \(P\) (collective signaling game)

Mispricing \((F - P)\) predictable (in part) by entrepreneurs

Key positive result: informational spillovers amplify contribution of noise to aggregate volatility
High aggregate investment ($K$) is good news for profitability

Traders cannot tell whether high $K$ is driven by high profitability or correlated error in entrepreneurs’ information

Entrepreneurs anticipate effect of $K$ on $P$ (collective signaling game)

Mispricing ($F - P$) predictable (in part) by entrepreneurs

Key **positive** result: informational spillovers **amplify** contribution of noise to aggregate volatility

Key **normative** result: In the presence of information spillovers, the contribution of noise to aggregate volatility is inefficiently high
High aggregate investment ($K$) is good news for profitability.

Traders cannot tell whether high $K$ is driven by high profitability or correlated error in entrepreneurs’ information.

Entrepreneurs anticipate effect of $K$ on $P$ (collective signaling game).

Mispricing ($F - P$) predictable (in part) by entrepreneurs.

Key **positive** result: informational spillovers **amplify** contribution of noise to aggregate volatility.

Key **normative** result: In the presence of information spillovers, the contribution of noise to aggregate volatility is inefficiently high.

Policy: price stabilization policies (e.g., taxes on financial trades) contingent on both the price and aggregate investment:

$$\tau = \tau(p, K) = \tau_0 + \tau_p p + \tau_K K$$

can (indirectly) control price response to various sources of information and hence complementarity in entrepreneurs’ investment decisions.
Neoclassical microfoundation of “beauty contests” and “irrational exuberance”
Neoclassical microfoundation of “beauty contests” and “irrational exuberance”

Various extensions in which (i) information flows in both directions, (ii) exuberance originates in either market

Robustness to (a) heterogenous priors (b) richer specifications of real and financial sector

(Robust) message of this literature: as long as prices remain imperfectly revealing, information spillovers between real and financial sector are a source of amplification, nonfundamental volatility, and inefficiency
Neoclassical microfoundation of “beauty contests” and “irrational exuberance”

Various extensions in which (i) information flows in both directions, (ii) exuberance originates in either market

Robustness to
(a) heterogenous priors
(b) richer specifications of real and financial sector
Neoclassical microfoundation of “beauty contests” and “irrational exuberance”

Various extensions in which (i) information flows in both directions, (ii) exuberance originates in either market

Robustness to
(a) heterogenous priors
(b) richer specifications of real and financial sector

(Robust) message of this literature: as long as prices remain imperfectly revealing, information spillovers between real and financial sector are a source of amplification, nonfundamental volatility, and inefficiency