Feedback Effects, Market Valuations, and Real Efficiency

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Motivation

Secondary financial markets appear to have real effects

- Corporate decision makers learn from prices, thereby allocating the resources more efficiently
- "Feedback effect" between real and financial sectors

Empirical evidence?

- Firms respond to stock prices (e.g., Chen et al, 2007)
- But the contribution of learning from stock price to firm productivity is small (David et al, 2016)

Motivation

One possibility: corporate decisions involving long-term commitments?

- E.g., strategic planning and market positioning of firms
- Stock markets may promote myopic corporate behavior
- The "short-termism" may happen when short-term prices incorrectly reflect the long-term consequences of certain types of actions

Motivation

This paper studies the interdependence of myopic corporate behavior and the feedback effect

- The feedback effect leads to an inflated equity price through risk-driven asymmetric trading behavior of speculators
- Combined with the short-term incentive for decision makers, this feature can explain:
  - why the feedback effect is prevalent (through ex ante project choice)
  - weak contribution of learning from prices to firm productivity

Situation and research question

A modeling framework to analyze the interaction between corporate investments and financial prices via information and risk channels

- A firm's decision maker chooses between two mutually exclusive projects
  - Two projects are ex ante identical in terms of initially unknown productivity, which follows a Pareto distribution
  - They differ on who has an informational advantage
- The financial market opens
- The DM determines the scale of operations on the chosen project

Situation and research question

The DM's choice between two long-term projects

- Scenario 1: The DM holds better information about the productivity of project, which leads to better decison making.
- Scenario 2: Its productivity is better known to the financial market. Thus, the DM learns from the price.

How does the short-term incentive for the DM affect his project choice?

- Example: Innovation strategy of corporate executives
- Existing customers' needs vs. creating new markets
- Equivalently, demand- vs. quality-related information

Main results

Scenario 1: Superior information for the firm

- The price is unbiased about the firm's profit from operations
- It is due to a symmetric impact of noise trade on the price conditional on large project values

Scenario 2: Superior information for the financial market

- The average price is higher than the firm's profit from operations
- Higher price -> Higher operation scale -> Higher valuation risk
- Speculators are less (more) aggressive against higher (lower) prices. Accordingly, the impact of noise trade is asymmetric.

Main results

Combining these scenarios together:

- Learning from price causes an ex ante price inflation
- The DM chooses the less efficient long-term project which is more informative to the financial market

Other insights than the inefficient project choice:

- Explains the availability of superior information in financial markets
- The feedback effect results in smaller scale of operations by the firm

Literature

Feedback effects of secondary financial markets

- The existing frameworks explain multiple equilibria, trading frenzy, and side effects of information disclosure, etc (e.g., Goldstein, Ozdenoren & Yuan, 2013; Boleslavsky, Kelly & Taylor, 2017; Goldstein & Yang, 2019)
- But they abstract from investors' risk aversion and the resulting asymmetry in their trades
- Asymmetry in trading behavior (Boleslavsky, Kelly & Taylor, 2017; Edmans, Goldstein & Jiang, 2015)

Corporate short-termism

- Signal-jamming based on hidden actions (e.g., Stein, 1989; Aghion & Stein, 2008)
- Determination of executive compensation (e.g., Bolton et al., 2006)

Model

A firm has access to the following production technology for project $d \in \{A, B\}$:

$$\pi_d = \underbrace{a_d}_{\text{Operation scale}} \cdot \underbrace{(\theta_d + \varepsilon_d)}_{\text{Per-scale revenue}} - \underbrace{\frac{1}{2} a_d^2}_{\text{Cost of operations}},$$

where

- θ_d and ε_d are the forecastable and unforecastable parts of productivity factors, respectively;
- a_d is the scale of operations on the chosen project d.

Model

The order of game:

- At $t = 0$, the DM chooses project $d \in \{A, B\}$. They differ on which side is more informative at $t = 1$:

	Project A	Project B
DM's information	$\mathscr{I}_{IA} = \{\theta_A, p_A\}$	$\mathscr{I}_{IB} = \{p_B\}$
Market's information	$\mathscr{I}_{OA} = \{s, p_A\}$	$\mathscr{I}_{OB} = \{\theta_B, p_B\}$

- At $t = 1$, the financial market opens and determines p_d
- At $t = 2$, the DM decides the scale of operations a_d
- At $t = 3$, the firm generates cash flows π_d and all agents get paid

Model: productivity of projects

The per-scale revenue is $\theta_d + \varepsilon_d$ for project $d \in \{A, B\}$

- The project value $\theta_d \geq 0$ commonly follows a Pareto distribution

$$g(\theta_d) = \frac{\lambda - 1}{\gamma} \left(\frac{\theta_d}{\gamma} + 1 \right)^{-\lambda}$$

  for constant $\gamma > 0$ and $\lambda \in (1, 3]$. Notably, it has a "fat" tail.
- The unforecastable part ε_d follows $N(0, \sigma_\varepsilon^2)$

Model: financial sector

At $t = 1$, a continuum of informed speculators $i \in [0,1]$ and noise traders participate in the financial market

- Given project d, informed speculators submit $x_{id}(\mathscr{I}_{Od})$ to maximize $U_{id} = -\frac{1}{\varphi}\exp[-\varphi\{x_{id}(\pi_d - p_d)\}]$
- Recall $\mathscr{I}_{OA} = \{s, p_A\}$ and $\mathscr{I}_{OB} = \{\theta_B, p_B\}$
  - In case of project A, we assume $s = \theta_A + \eta$, where η's support is $\{\eta_1, \cdots, \eta_K\}$ with probabilities $r_1, \cdots, r_K$, respectively. Wlog, $E[\eta] = 0$.
- Noise trade is a random variable ω whose support is $\{\omega_1, \cdots, \omega_J\}$ with probabilities $q_1, \cdots, q_J$, respectively. Wlog, $E[\omega] = 0$.

Model: feedback from price

Two scenarios at $t = 2$:

- Project A: The DM knows θ_A, which is used to decide the scale of operations a_A. No need for price learning.
- Project B: The DM learns from the price p_B to decide the scale of operations a_B.

Model: equilibrium definition

Equilibrium consists of

- Project choice $d \in \{A, B\}$
- Informed speculators' demands $x^*_{iA} = x^*_{iA}(\mathscr{I}_{OA})$, $x^*_{iB} = x^*_{iB}(\mathscr{I}_{OB})$
- Price functions $p^*_A = p^*_A(\mathscr{I}_{OA}, \omega)$, $p^*_B = p^*_B(\mathscr{I}_{OB}, \omega)$
- DM's investment strategies: $a^*_A = a^*_A(\mathscr{I}_{IA})$, $a^*_B = a^*_B(\mathscr{I}_{IB})$

Model: equilibrium definition

...such that the following conditions are satisfied:

1. The project $d \in \{A, B\}$ maximizes $E_{\hat{g}}[p_d] = \int_0^M p_d \hat{g}_{(0,M)}(\theta_d) d\theta_d$ given truncated distribution $\hat{g}_{(0,M)}(\theta_d)$ over $(0, M)$ for sufficiently large $M > 0$
2. Demands $x_{id}^*(\mathscr{I}_{Od})$ maximize $E[U_{id}|\mathscr{I}_{Od}]$ at $t = 3$, where $\mathscr{I}_{OA} = \{s, p_A\}$ and $\mathscr{I}_{OB} = \{\theta_B, p_B\}$. Also, the price p_d clears the market, i.e. $\int_{i \in [0,1]} x_{id}^*(\mathscr{I}_{Od})\, di + \omega = 0$;
3. At $t = 2$, the scale of operations a_d^* maximizes $E[\pi_d|\mathscr{I}_{Id}]$, where $\mathscr{I}_{IA} = \{\theta_A, p_A\}$ and $\mathscr{I}_{IB} = \{p_B\}$.

Model: equilibrium definition

As M is large, the expected price $E_{\hat{g}}[p_d]$ predominantly reflects those conditional on large project values θ_d. That is, $E_{\hat{g}}[p_d] \approx E[p_d|\theta_d]$ for large θ_d.

- The decision maker effectively restricts attention to these large values of θ_d when it comes to comparing the expected prices

Feedback effect without fat-tailedness?

Let's focus on project B where the feedback effect occurs. What if the per-unit asset payoff is the project value $\tilde{\theta}_B$ (rather than the firm's profit), and it is normally distributed?

$$\tilde{p}_B = \tilde{\theta}_B + \varphi \sigma_\varepsilon^2 \tilde{\omega}$$

- The existence and uniqueness of equilibrium
- The price $\tilde{p}_B$ is equal to $\tilde{\theta}_B$ on average
  - Why? (i) The asset supply is zero so that speculators buy or sell symmetrically; (ii) Speculators' trading aggressiveness is symmetric between when they buy and when they sell.
- Linearity of $E[\tilde{\theta}_B|\tilde{p}_B]$ in $\tilde{\theta}_B$ (provided that ω is normal as well)

Feedback effect without fat-tailedness?

Now, what if the per-unit asset payoff is the firm's profit $\pi_B = \tilde{a}_B\tilde{\theta}_B - \frac{1}{2}\tilde{a}_B^2$, maintaining $\tilde{\theta}_B$ being normal?

$$\tilde{p}_B = \underbrace{\tilde{a}_B\tilde{\theta}_B - \frac{1}{2}(\tilde{a}_B)^2}_{E[\pi_B^*|\tilde{\theta}_B,\tilde{p}_B]} + \underbrace{\varphi\sigma_\varepsilon^2(\tilde{a}_B)^2\tilde{\omega}}_{\varphi\omega \mathrm{Var}[\pi_B^*|\tilde{\theta}_B,\tilde{p}_B]}, \text{ where } \tilde{a}_B = E[\tilde{\theta}_B|\tilde{p}_B]$$

- As the operation scale increases, the noise term becomes larger in the price $\tilde{p}_B$ because speculators face larger risk
- The operation scale depends on the price via the DM's learning
- This chain of influence undermines the linearity of $E[\tilde{\theta}_B|\tilde{p}_B]$
- It is the case ***unless*** $\tilde{\theta}_B$ follows a power distribution

Equilibrium for project A

In the case of project A, the decision maker optimally chooses $a_A^*(\mathscr{I}_{IA}) = \theta_A$ so that the firm's profit is given by

$$\pi_A^* = a_A^*(\mathscr{I}_{IA})(\theta_A + \varepsilon_A) - \frac{(a_A^*(\mathscr{I}_{IA}))^2}{2} = \frac{\theta_A^2}{2} + \theta_A\varepsilon_A.$$

How about the financial market? Informed speculators make inference about the firm's profit π_A given their signal s.

Equilibrium for project A

The complication in the equilibrium price is due to the non-normal uncertainty given signal s. We have

$$p_A = \frac{E[\theta_A^2|s]}{2} + \varphi\omega\sigma_\varepsilon^2 E[\theta_A^2|s] + \left(\frac{1}{2} + \varphi\omega\sigma_\varepsilon^2\right) \frac{\sum_{k=1}^K \hat{\eta}_k(s) r_k \exp\left(\hat{\eta}_k(s)\left(\frac{\varphi}{2}\omega + \frac{\varphi^2}{2}\omega^2\sigma_\varepsilon^2\right)\right)}{\sum_{k=1}^K r_k \exp\left(\hat{\eta}_k(s)\left(\frac{\varphi}{2}\omega + \frac{\varphi^2}{2}\omega^2\sigma_\varepsilon^2\right)\right)},$$

where $\hat{\eta}_k(s)$ is the (perfectly) inferred realization of $\theta_A^2 - E[\theta_A^2|s]$ given the realization of s and η_k for $1 \leq k \leq K$.

1. The firm's expected profit
2. Mispricing term from the residual uncertainty over π_A given θ_A
3. Mispricing term from the uncertainty over θ_A given s

Equilibrium for project A

Proposition 1. In the scenario where project A is chosen at $t = 0$, there is at least one equilibrium where the decision maker uses her own information about the project value θ_A at $t = 2$.

Corollary 1. In every equilibrium, the following equality holds:

$$\lim_{M \to \infty} \frac{E_{\hat{g}}\left[p_A^* - \pi_A^*\right]}{E_{\hat{g}}\left[\pi_A^*\right]} \to 0.$$

Equilibrium for project A

- The corollary suggests that the firm is ex ante valued as π_A^*
- The price is "unbiased" due to two reasons again: (i) The asset supply is zero; (ii) Speculators' trading aggressiveness is symmetric between when they buy and when they sell.
- The latter holds only at the "tail" of θ_A, where their signal $s = \theta_A + \eta$ is precise about θ_A

Equilibrium for project B

In the case of project B, the DM decides the scale of operations based on p_B. With conjectured investment strategy $a_B^* = a_B^*(p_B)$, the firm's profit is given by

$$\pi_B^* = a_B^*(p_B)(\theta_B + \varepsilon_B) - \frac{1}{2}(a_B^*(p_B))^2,$$

which pins down the price p_B as follows:

$$p_B = \underbrace{a_B^*(p_B)\theta_B - \frac{1}{2}(a_B^*(p_B))^2}_{E[\pi_B|\theta_B,p_B]} + \underbrace{\varphi\sigma_\varepsilon^2(a_B^*(p_B))^2\omega}_{\varphi\omega Var[\pi_B|\theta_B,p_B]}.$$

Equilibrium for project B

Conjecture

$$a_B^*(p_B) = \alpha(p_B) \cdot \hat{\theta}(p_B),$$

where $\hat{\theta}(p_B) := \frac{p_B + \frac{1}{2}\left(a_B^*(p_B)\right)^2}{a_B^*(p_B)}$ is a "normalized" signal from the price.

- Suppose $p_B = p_B^*(\theta_B, \omega)$ in equilibrium. Then the signal $\hat{\theta}(p_B^*(\theta_B, \omega))$ is equal to $\theta_B + \varphi\sigma_\varepsilon^2 a_B^*(p_B^*(\theta_B, \omega))\,\omega$.

Equilibrium for project B

Given this conjecture, the optimal scale of operations $E[\theta_B|p_B]$ is

$$E[\theta_B|p_B] = \frac{\sum_{j=1}^{J} \theta_{Bj}(p_B)\, g\left(\theta_{Bj}(p_B)\right) q_j}{\sum_{j=1}^{J} g\left(\theta_{Bj}(p_B)\right) q_j},$$

where

$$\begin{aligned} \theta_{Bj}(p_B) &= \hat{\theta}(p_B)\left(1 - \varphi\sigma_\varepsilon^2 \omega_j \alpha(p_B)\right); \\ \hat{\theta}(p_B) &= \sqrt{\frac{2p_B}{2\alpha(p_B) - (\alpha(p_B))^2}}. \end{aligned}$$

Then match with the initial conjecture $a_B^*(p_B) = \alpha(p_B) \cdot \hat{\theta}(p_B)$ to determine $\alpha(p_B) \in (0,1)$ for each $p_B > 0$.

Equilibrium for project B

So, $\alpha(p_B) \in (0,1)$ is pinned down by

$$\alpha(p_B) = \frac{\sum_{j=1}^{J} \left(1-\varphi\sigma_\varepsilon^2\omega_j\alpha(p_B)\right) g\left(\hat{\theta}(p_B)\left(1-\varphi\sigma_\varepsilon^2\omega_j\alpha(p_B)\right)\right) q_j}{\sum_{j=1}^{J} g\left(\hat{\theta}(p_B)\left(1-\varphi\sigma_\varepsilon^2\omega_j\alpha(p_B)\right)\right) q_j}.$$

- For large θ_B, we can see $g\left(\hat{\theta}(p_B)\left(1-\varphi\sigma_\varepsilon^2\omega_j\alpha(p_B)\right)\right) \approx \hat{\theta}(p_B)^{-\lambda}\left(1-\varphi\sigma_\varepsilon^2\omega_j\alpha(p_B)\right)^{-\lambda}$ so that $\hat{\theta}(p_B)^{-\lambda}$ can be taken off. As a result, $\alpha(p_B)$ is invariant to the realized price p_B.

Equilibrium for project B

Proposition 2. In the scenario where project B is chosen at $t = 0$, if $\varphi\sigma_\varepsilon^2\omega_j \in \left(-\frac{2}{\lambda-1}, 1\right)$ for every $j \in \{1, \cdots, J\}$, then there is at least one equilibrium where the decision maker learns about the project value θ_B from the price at $t = 2$.

Equilibrium for project B

Proposition 2 [ctd.] Conditional on large project value θ_B, the decision maker's investment strategy a_B^* and the equilibrium price p_B^* are given by

$$a_B^*(p_B) = \sqrt{\frac{2\overline{\alpha} p_B}{2-\overline{\alpha}}} \text{ and } p_B^*(\theta_B,\omega) = \left(\overline{\alpha} - \frac{1}{2}\overline{\alpha}^2\right)\left(\frac{\theta_B}{1-\varphi\sigma_\varepsilon^2\overline{\alpha}\omega}\right)^2,$$

where $\overline{\alpha} \in (0,1)$ is constant. In this limit,

$$a_B^*(p_B^*(\theta_B,\omega)) = \frac{\overline{\alpha}\theta_B}{1-\varphi\sigma_\varepsilon^2\overline{\alpha}\omega}.$$

Equilibrium for project B

The existence of (feedback-effect) equilibrium is guaranteed when $\varphi\sigma_\varepsilon^2\omega_j \in \left(-\frac{2}{\lambda-1}, 1\right)$ for every $j \in \{1, \cdots, J\}$

- This condition seems natural: feedback-effect equilibrium is more likely with smaller noise
- Whether ω is small or large, there is a trivial equilibrium without feedback effect (i.e., $a_B^* = 0$ and $p_B^* = 0$)

Equilibrium for project B

The information in the price is $\hat{\theta}(p_B) = \frac{p_B + \frac{1}{2}\left(a_B^*(p_B)\right)^2}{a_B^*(p_B)}$

- As a signal about θ_B, it is equivalent to $\theta_B + \varphi\sigma_\varepsilon^2 a_B^*(p_B)\,\omega$, which is asymmetric across the price. That is, it is noisier with higher prices.
- Higher prices lead to higher operation scales, which result in higher uncertainty facing informed speculators. As a result, they are less aggressive, making these prices noisier.

Equilibrium for project B

Corollary 2. In the scenario where project B is chosen at $t = 0$, the following inequality holds:

$$\lim_{M \to \infty} \frac{E_{\hat{g}}\left[p_B^* - \pi_B^*\right]}{E_{\hat{g}}\left[\pi_A^*\right]} = 2\varphi\sigma_\varepsilon^2\overline{\alpha}^2 \sum_{j=1}^{J} \frac{q_j\omega_j}{\left(1 - \varphi\sigma_\varepsilon^2\overline{\alpha}\omega_j\right)^2} > 0.$$

Equilibrium for project B

Why $E_{\hat{g}}[p_B^*] > E_{\hat{g}}[\pi_B^*]$? Recall that

$$p_B = \underbrace{a_B^*(p_B)\,\theta_B - \frac{1}{2}\left(a_B^*(p_B)\right)^2}_{E[\pi_B|\theta_B, p_B]} + \underbrace{\varphi\sigma_\varepsilon^2\left(a_B^*(p_B)\right)^2\omega}_{\varphi\omega Var[\pi_B|\theta_B, p_B]}.$$

- As $\omega = 0$, the price is identical to $E[\pi_B^*|\theta_B, p_B]$.
- As ω is random, the price goes up on average.
  - As $\omega > 0$, the price goes up. Informed speculators trade against it, but they trade less as they expect $a_B \uparrow$, which means more risk. Thus, larger impact of $\omega \uparrow$ on the price.
  - As $\omega < 0$, the opposite holds, driving smaller impact of $\omega \downarrow$ on the price.

Equilibrium for project B

The corollary shows that the (positive) misvaluation via noise trade is non-negligible, in contrast to that via signal errors under project A. Indeed, it becomes proportionally large as θ_B is large.

- Compared with project-A scenario, what is broken is the (second) point that speculators' trading aggressiveness is symmetric between when they buy and when they sell
- Why? they face more (less) risk when they observe a higher (lower) price so that they want to sell (buy) the asset

Project choice

Now we turn to the determination of projects by the DM

- The DM cares about the price at the subsequent period
- He chooses a project if the project is superior than the other for large project values

Project choice

The (short-term-oriented) DM follows the criterion by Definition 1, which corresponds to maximization of the expected price (i.e., $E_{\hat{g}}[p_d^*]$)

- Project A always yields a higher expected profit
- But the decision maker may get a higher expected price at the subsequent period by choosing project B (i.e., $E_{\hat{g}}[p_B^*] > E_{\hat{g}}[p_A^*]$)
- This occurs when project B leads to price inflation of shares even larger than the loss of profit

Project choice

Proposition 3. In equilibrium, the decision maker chooses project B at $t = 0$ when λ is sufficiently close to 2.

The DM's short-term incentive distorts his ex ante project choice toward a project whose information is superior in the financial market

1. The prevalence of superior information in fianancial markets
2. The feedback effect can cause an inefficiency in the real sector (via price inflation of equity)

Project choice

Project A would be chosen in the natural "benchmark"

- E.g., long-term-oriented DM or his commitment against learning from the price

The efficiency loss of project B is given by

$$E[\pi_A^*|\theta_A = \theta] - E[\pi_B^*|\theta_B = \theta] = \frac{\theta^2}{2}\sum_{j=1}^{J} q_j \left(1 - \frac{\overline{\alpha}}{1 - \varphi\sigma_\varepsilon^2\overline{\alpha}\omega_j}\right)^2$$

Project choice

Example. We can find a simple example where the DM chooses project B even with $\lambda = 3$.

- $J = 2$, $\omega_1 = -\omega_2 = \left(\varphi\sigma_\varepsilon^2\right)^{-1}\delta$ for $\delta \in (0,1)$, and $q_1 = q_2 = \frac{1}{2}$
- The DM chooses project B if and only if

$$\left(1 - \frac{\overline{\alpha}}{2}\right) \frac{\left\{\sum_{j=1}^{J} q_j \left(1 - \varphi\sigma_\varepsilon^2\overline{\alpha}\omega_j\right)^{-2}\right\}^2}{\sum_{j=1}^{J} q_j \left(1 - \varphi\sigma_\varepsilon^2\overline{\alpha}\omega_j\right)^{-3}} > \frac{1}{2}.$$

Here, we can show that the above fraction term is always larger than 1 for $\delta \in (0,1)$. This implies that the above inequality holds.

Scale of operations

Proposition 4. Conditional on large project values θ_A and θ_B, project B tends to have a smaller scale of operations than project A (i.e., $a_A^* = \theta_A$ and $E[a_B^*|\theta_B] < \theta_B$). Further, the firm tends to spend less on its operations under project B compared with project A. In particular, we have

$$\frac{E_{\hat{g}}\left[\frac{1}{2}\left(a_B^*\left(\mathscr{I}_{IB}\right)\right)^2\right]}{E_{\hat{g}}\left[\frac{1}{2}\left(a_A^*\left(\mathscr{I}_{IA}\right)\right)^2\right]} \to \sum_{j=1}^{J}\left(\frac{\overline{\alpha}}{1-\varphi\sigma_\varepsilon^2\overline{\alpha}\omega_j}\right)^2 q_j < 1 \text{ as } M \to \infty.$$

Scale of operations

The "biased" operation scale under project B is generally due to the absence of finite expectation under fat-tail distribution

- Otherwise: $E[a_B^*] = E[E[\theta_B|p_B]] = E[\theta_B]$

The sign of the bias is consistently negative under Pareto distribution

- Positive (negative) noise leads to higher (smaller) operation scale
- Such effect is weakened (reinforced) by the strong prior of fat-tail distribution concentrated on small project values.

Numerical results

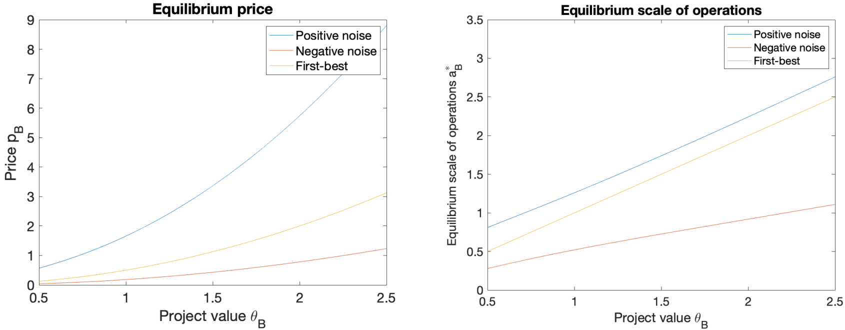

Figure: Numerical results on the effects of project value θ_B on the price p_B and the operation scale a_B^*

Examples of inefficiency

Innovation strategy: exploitation vs. exploration

- Exploitation tends to meet the needs of existing customers
  - E.g. hand-wound watches to automatic ones
- Exploration examines new markets
  - E.g. battery-powered watches
- The demand-related information tends to be more useful for the former, whereas the quality-related information is more important for the latter
  - The financial market is more informative about the demand-related information

Examples of inefficiency

- The model suggests that a firm's short-term-oriented DM may choose exploitative innovation to boost the stock price through its reliance on the demand-related information
- Empirical evidence on the association between short-term incentives and exploitation (e.g., Flammer and Bansal, 2017)
  - It is not straightforward with a financial market with informed speculation, which may value long-term cash flows
  - Also, such innovation strategy may not be a "hidden" action in contrast to previous theories on short-termism (e.g., Stein, 1989; Bolton, Scheinkman and Xiong, 2006)
  - Our main results also predict price inflation with exploitative innovation strategy

Learning from stock prices

Empirical evidence

- Firms behave as if they recognize the informativeness of stock price (e.g., Luo, 2005; Dessaint et al., 2019)
- Mixed findings on the contribution of learning from stock price to the real productivity (e.g., David, Hopenhyn & Venkateswaran, 2016)

Implications of the main results

- Even if firms recognize the informativeness of stock price, they might not benefit from learning from stock price when their real decisions feature long-term commitments.
- Another related possibility is committing against learning from stock price (e.g., remaining private).

Comparison with other trading environments

"Uninformed" speculation in the financial market

- They would behave like market-makers
- In the limit, the price is unbiased in both scenarios A and B, shutting down our inefficiency result

Non-competitive financial market (together with the uninformed market maker)

- It results in a price-manipulating behavior of large informed speculator (e.g., Boleslavsky et al, 2017; Edmans et al, 2015)
- Price inflation occurs, but the mechanism is rather different

Concluding remarks

- This paper offers a framework to analyze the interaction between real and financial sectors via information and risk channels
- The feedback effect and the resulting risk-driven asymmetry in trades cause a price inflation of equity, leading to an inefficiency in project choice
- This explains the prevalence of the feedback effect and its small contribution to firm productivity
- Possibility of policy implications?