Discussion of *Sequential Reporting Bias*

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Before I begin

- My bias
  - Empiricist who values theory
  - Interested in role of accounting information in capital markets
- My plan
  - Explain why I think the paper is important
  - Overview main results
  - Raise questions aimed at increasing impact
    1. Why focus on bias in reports?
    2. What about prices between Leader's and Follower's reports?
    3. Which predictions to test and how?
    4. Why do we care?

Why is paper important?

- Implications of sequential reporting when there are informational spillovers and firms maximize price and can manipulate reports
- Prior research
  - Recognizes information spillovers and sequential learning can affect firms' incentives to manipulate reports
  - Focuses on simultaneous reporting
- Why is this paper important?
  - Sequential reporting is the norm
  - Information transfers are well documented
  - Managing earnings and other disclosures is pervasive
  - But we don't know how these interrelate or what the implications are

Why is paper important?

- Extensive empirical literature on information spillovers
  - Typically framed as earlier information for non-disclosing firms
  - Intra-industry and market-wide information
    - Intra-industry (Foster 1981; Baginski 1987)
    - Market-wide component of earnings guidance (Anilowski et al. 2007) and earnings (Ball et al. 2009); Bellwether firms (Bonsall et al. 2013); Market volatility risk (Barth and So 2014)
- This paper reveals overlooked costs to sequential reporting
  - Information loss to the market
  - Incentive for biased reports, which investors must assess before reacting to the report, and results in less efficient prices
    - Similar to costs of asymmetric timeliness of earnings (Barth et al. 2020)

Model setup

- Firms
  - Have correlated fundamentals, which leads to information spillovers that affect reports when reporting is sequential; firms learn about their own firm value by observing correlated firm's report
  - Receive correlated signals, have private costs of manipulation (lower if firm has more precise information), and choose degree of manipulation
  - Maximize share price after disclosure by both firms
- Investors
  - Risk-neutral => only care about expected value
  - Uncertain about firms' objectives and private information
- Reporting
  - Sequence is exogenous and common knowledge

Timeline

$$r_1 = D_1 s_1 + \eta_1 + b_1 \qquad r_2 = D_2 s_2 + \eta_2 + X(r_1 - b_1) + b_2$$

$$s_1 = \theta_1 + \varepsilon_1 \qquad s_2 = \theta_2 + \varepsilon_2$$

$$\frac{c_1(r_1 - \theta_1 - \eta_1)^2}{2} \qquad \frac{c_2(r_2 - \theta_2 - \eta_2)^2}{2}$$

$$\theta_i \sim N(0, \frac{1}{\tau_i^{\theta}})$$

$$\varepsilon_i \sim N(0, \frac{1}{\tau_i^{\varepsilon}})$$

$$\eta_i \sim N(0, \frac{1}{\tau_i^{\eta}})$$

Main result #1
Sequential vs simultaneous reporting

- Follower learns about fundamental from Leader's report, r_1
  - Puts less weight on its private information, s_2, in its report, r_2
  - Less weight on s_2 means information loss to market
  - Market recognizes information loss and weights Leader's report more, which amplifies Leader's incentives to manipulate
- Equilibrium
  - Leader's stock price more sensitive to its report
  - Leader always manipulates more, $b_1 > b_1^B$
  - Information loss means less efficient and less volatile prices
- Higher correlation, ρ, increases

  Follower's reliance on Leader's report, market weighting of Leader's report, and Leader's incentive to manipulate

Main result #2
Sequential reporting with endogenous timing

- Firms trade off costs and benefits and choose when to report
  - Reporting early generates exogenous benefits
  - Reporting later allows for learning
  - Reporting early vs later affects cost of manipulation
- With homogeneous firms
  - Sequential reporting when cost of manipulation is high; otherwise simultaneous
- With heterogeneous firms
  - Sequential reporting when cost of manipulation is high for one firm and precision of manipulation cost is sufficiently low for another; otherwise simultaneous

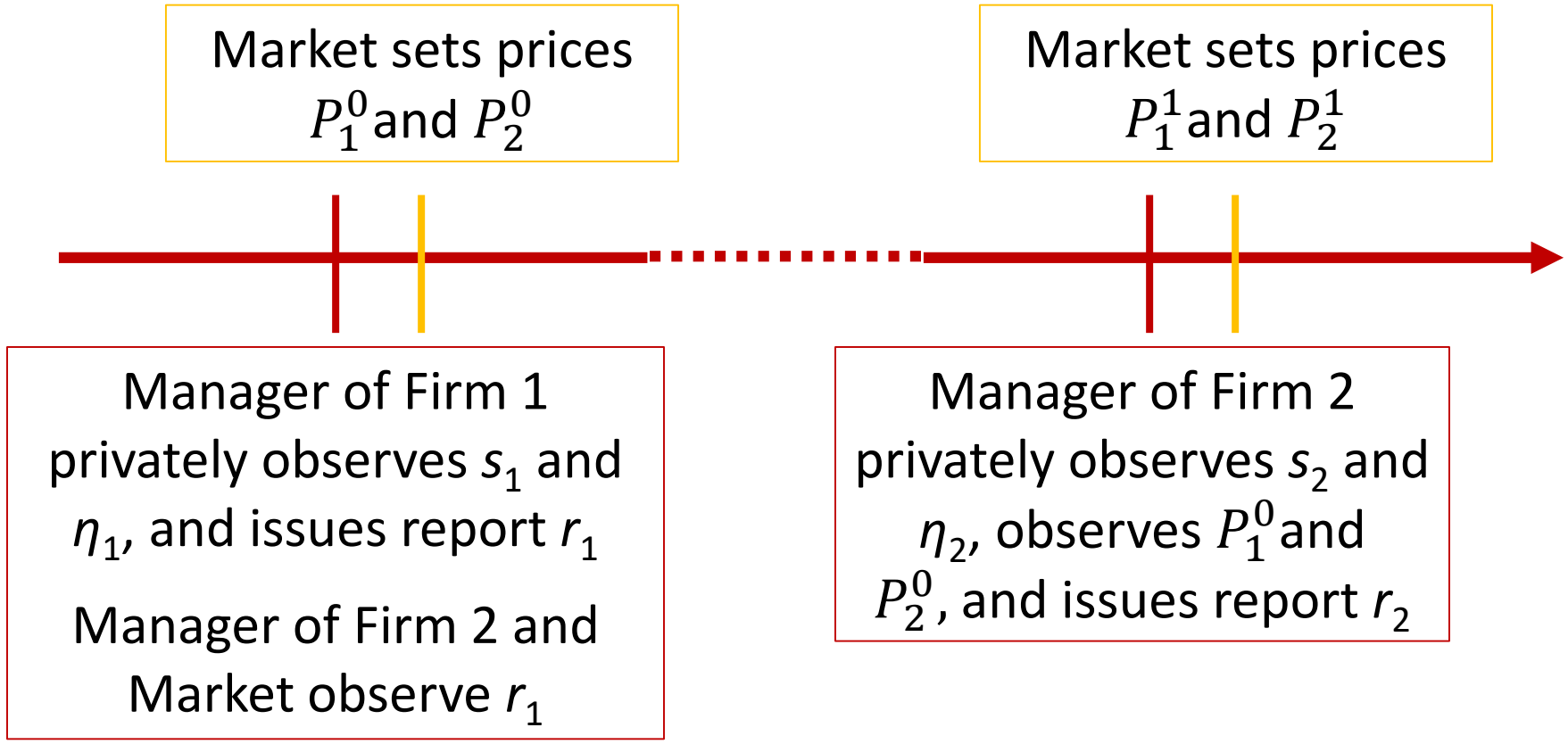
Question #1
Why focus on bias in reports?

- Vast literature on earnings management reveals report bias is an important issue in accounting
- Despite paper's title, bias *per se* does not play a major role
  - Learn which firms bias more and less but manager bears cost
- Does the market care?
  - Are there any negative pricing implications of biasing reports?
  - Market penalty for inaccuracy or negative assessment of manager talent?
  - Why doesn't the market's anticipation of higher bias and corresponding decreased weight on Leader's report remove incentive for bias?

Question #2
What about prices between reports?

- What if firms or market regulators care about price efficiency?

Revised timeline



Question #2
What about prices between reports?

- Can the market undo the bias in the Leader's report before observing the Follower's report?
  - How do prices of both firms react to Leader's report? To Follower's report?
  - How does this affect Leader's and Follower's reports?
- Does it matter how much time elapses between reports?
  - One day? Two weeks? More?
  - Who reaps benefits in the meantime?
- What is cost to the market of additional time it takes for investors to determine the price implications of the Leader's report?

Question #3
Testing empirical predictions?

- Paper offers a long list of empirical predictions (five pages!) ☺
- Would be more accessible if
  - Tied directly to the model so as to not lose the details
  - But, stated less densely and more succinctly
  - Focused insights researchers might obtain, rather than testing the model
- Focus on predictions unique to the model and, thus, most promising for new empirical insights
  - To me, key insight is sequential reporting has costs previously overlooked
- My recommendation?

Focus on effects of sequential reporting on price efficiency and delay in price formation

Question #3
Testing empirical predictions?

- What if N > 2?
  - Imagine firms X, Y, and Z report sequentially
  - X is Leader to Y and Z, but Y is Follower of X and Leader of Z
- What are characteristics of reports that best fit the model?
  - Earnings announcements and management forecasts?
- What are good proxies for theoretical constructs?
  - Market inference of reports is not intuitive; why is this also the manager's objective function?
  - How do we identify unobservable cost of manipulation?
  - Any other guidance would be helpful

Question #3
Testing empirical predictions?

	Construct	Alternative Construct	Possible Proxies
τ_i^{θ}	Precision of fundamental	Opacity of information Information asymmetry	??
τ_i^{ε}	Precision of firm information, *s*		??
τ_i^{η}	Precision of manager's manipulation cost	Market inference of information Precision of manager's objective function Information asymmetry	Corporate governance Complexity Institutional investors Established industries
ρ	Correlation of fundamentals	Information spillovers	??
c_i	Cost of manipulation		??
b_i	Bias in report		??

Question #3
Testing empirical predictions?

- How do we identify more vs less homogeneous industries?
  - Isn't industry designation aimed at identifying homogeneity?
  - If industry => homogeneous, does Theorem 2 tell us cost of manipulation is high because we have sequential reporting?
  - Why industry and not other types of peer firms?
- What are "staggered" vs "clustered" and "dispersed" reports?
- What if a firm's incentive is to bias report downward?
- To apply Noh et al. (2021) calendar result, wouldn't firms need to not care about their reporting order but care enough to manipulate in response to their order? If so, is this plausible?

Question #4
Why do we care?

- What extant research results can model's insights explain?
  - What explains industry differences in extent of sequential reporting?
  - Why are some firms Lead reporters and some are Followers?
- What open research questions could be addressed using the model's insights?
  - Is sequential reporting associated with bias in reports?
  - Are there market costs of sequential reporting?
  - Are there benefits?
- What would someone do differently after having read the paper?
  - Researcher? Firm? Market regulator?

Maybe title should be…..

Information Effects of Sequential Reporting

Conclusion

- Interesting paper!
- Thank you for the opportunity to discuss the paper; I enjoyed reading it and learned a lot
- I’m delighted to see theorists linking model insights to empirical predictions
- I hope my comments are helpful in improving the paper and wish you all the best with it!

Thank you!

Empirical predictions
Relating to price effects

2. Relative to simultaneous reporting
   a. Leader has more influence in shaping market beliefs
   b. Follower reports are less informative
   c. Less efficient prices and greater ex post information asymmetry, τ_1^{θ}
   d. Prices exhibit lower volatility

6. Price association with reports with sequential reporting
   ii. With high correlation, as correlation increases, long-term price impact of Leader's report increases when Leaders have high τ_1^{ε} and τ_1^{η} and low τ_2^{ε}. Follower's report has lower relation with long-term prices
   iii. Relative to simultaneous reporting, long-term prices are more associated with Leader's report in industries with higher τ^{η}, lower τ^{θ}, and higher ρ. For Follower, true in industries with less certain manipulation cost

Empirical predictions
Relative to simultaneous reporting

1. Leader always biases more and Follower biases more when manipulation cost is more precise.

2 a. Leader has more influence in shaping market beliefs

b. Follower reports are less informative

c. Less efficient prices and greater ex post information asymmetry, τ_1^{θ}

d. Prices exhibit lower volatility

6 iii. Long-term prices are more associated with Leader's reports in industries with more certain manipulation cost, τ_i^{η}, lower precision of fundamentals, τ_i^{θ}, and higher correlation of fundamentals, ρ. For Followers, true in industries with less certain manipulation cost

Empirical predictions
With both reporting regimes

4. Leaders and Followers manipulate more when industry peers have
   a. Less fundamental uncertainty (i.e., high τ_i^{θ})
   b. Less precise information (i.e., low τ_i^{ε})
   c. Less precise manipulation cost (i.e., τ_i^{η} low)

6. Price association with reports
   i. With sequential reporting in more homogeneous industries, immediate market reaction to early reports is stronger than to later reports
   ii. With sequential reporting and high correlation, long-term price impact of Leader's report increases in correlation, provided Leaders have high τ_1^{ε} and τ_1^{η} and low τ_2^{ε}. Followers have lower relation with long-term prices as correlations increase

Empirical predictions
With sequential reporting

3. When spillovers are prevalent (i.e., ρ is high enough)
   - Leader manipulates more when ρ is higher and it has informational advantage over other firms (i.e., high τ_1^{ε} and τ_1^{η} ; low τ_2^{ε} and τ_2^{η})
   - Follower manipulates less when correlation is higher
5. In more homogeneous industries
   - When manipulation cost is less certain (i.e., τ_i^{η} is low), early reporters manipulate more than later reporters
   - When manipulation cost is highly certain, later reporters manipulate more than early reporters
7. In homogeneous industries more sequential and dispersed reports when manipulation cost is less certain and manipulation cost is high