Price Drift Before U.S. Macroeconomic News: Private Information about Public Announcements?

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2024 年 11 月 06 日

Motivation

- Macroeconomic news announcements move financial markets.
  - Over half of the cumulative annual equity risk premium is earned on announcement days.
  - The Info is almost instantaneously reflected in prices once released.
- To ensure fairness, no market participant should have access to this info until the official release time.
- However, there is price drift before macroeconomic news.

Question

- Q1: Is there price drift before macroeconomic news?

  - Yes, approximately 30 minutes before the release time

- Q2: If yes, why?

  - Info leakage: organization type and release procedures

  - Superior forecasting that incorporates proprietary data

Contribution

- Literature on macroeconomic announcements

  - Prior1: Doesn't separate pre- and post-announcement effects

  - Prior2: Concludes the pre-announcement effect negligible.

    Exception: Hautsch et al. (2011) and Bernile et al. (2016)

  - Ext1: Longer preannouncement interval; More announcements; Recent period

  - Ext2: Explore the information leakage and other possible explanations

- Literature on the data leakage

  - Prior: Most in the context of Company-level news

  - Ext: In the context of macroeconomic news

Data

- Announcements: 30 macroeconomic announcements(23+7)
  - Standardized announcement surprise $S_{m,t}$:

$$S_{m,t} = \frac{A_{m,t} - E_{t-\tau}[A_{m,t}]}{\sigma_m}, \quad \sigma_m = \sqrt{\frac{1}{N_m - 1} \sum_{i=1}^{N_m} (S_{i,m} - \overline{S_m})^2}$$

  - $A_{m,t}$: macroeconomic announcement m released at time t
  - $E_{t-\tau}[A_{m,t}]$:market's expectation of the announcement from Bloomberg
- Markets data: Second-by-second transaction data (2008.01.01 to 2014.03.31)
  - Stock:E-mini S&P 500 stock index nearby-contract futures traded on CME
  - Bond: 10-year Treasury note nearby-contract futures traded on CME.

Design

- Time-series Regression: the asset return is a linear function of 3 components

$$R_t = \beta_0 + \sum_{j=1}^{J} \beta_j R_{j,t-1} + \sum_{m=1}^{M} \sum_{k=-1}^{K} \gamma_{m,k} S_{m,t+k} + \epsilon_t$$

- R_t: return from the [t−5min, t− 5sec] time window with announcement at time t

- $J = 2$ markets, M=30 announcements, K=5

- $S_{m,t+k}$: Standardized announcement m's surprise at time $t + k$

- $K \in [5, 0]$ for preannouncement effect, and $k = -1$ for postannouncement effect

- If $\gamma_m \equiv \sum_{k=0}^{K} \gamma_{m,k} \neq 0$, the pre-announcement price drift exists.

Q1:Preannouncement price drift

- $\gamma_m \equiv \sum_{k=0}^{K=5} \gamma_{m,k}$

Announcement	E-Mini S&P 500 γ_m	10-Year Treasury Note γ_m	Joint Test p-Value
ISM Non-Manufacturing Index	0.104 (0.017)***	−0.044 (0.009)***	<0.001
Pending home sales	0.099 (0.018)***	−0.028 (0.008)***	<0.001
ISM Manufacturing Index	0.088 (0.019)***	−0.022 (0.008)***	<0.001
CB Consumer Confidence Index	0.040 (0.020)*	−0.032 (0.008)***	<0.001
Existing home sales	0.054 (0.021)***	−0.016 (0.007)**	0.012
Advance retail sales	0.003 (0.018)	−0.019 (0.007)***	0.016
GDP preliminary	0.049 (0.030)	−0.031 (0.011)***	0.018
Initial jobless claims	−0.005 (0.007)	0.008 (0.003)***	0.020
GDP advance	0.015 (0.032)	−0.035 (0.015)**	0.049
Factory orders	−0.043 (0.021)**	0.019 (0.010)*	0.060
Industrial production	0.032 (0.018)*	−0.006 (0.010)	0.203
Trade balance	−0.016 (0.016)	0.010 (0.006)*	0.219
Construction spending	0.030 (0.019)	−0.009 (0.007)	0.226

- 9 announcements have the pre-announcement price drift, in the "correct" direction.

Q1:Preannouncement price drift

- 20 of the 30 announcements have a price impact

E-Mini S&P 500

Graph A. Announcements Without Evidence of Drift — *Graph B. Announcements With Evidence of Drift*
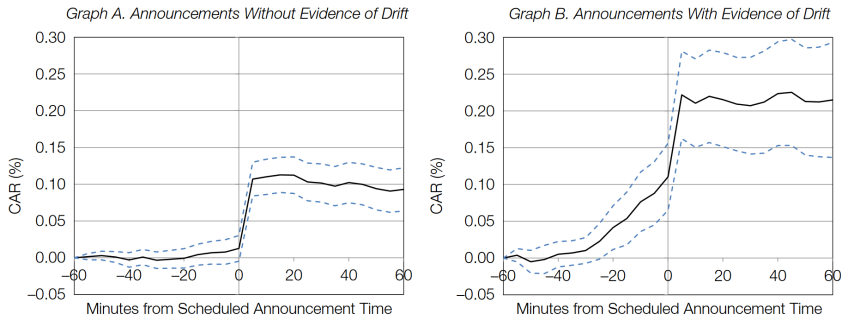
- A drift of almost 50% of the total announcement impact

- The drift begins approximately 30 minutes before the official release time.

Q2:Causes of Preannouncement Price Drift–Discussion

- The price drift are based on a broader info set $\Omega_{t-\tau}$ than the info set $\Omega_{t-\delta}$ reflected in $E_{t-\tau}[A_{m,t}]$

- Reason1(Private info): There is info beyond public info in the market
  - Info leakage
  - Proprietary info

- Reason2(Public info): The public info isn't fully captured by the Bloomberg consensus forecast
  - Unavoidable data imperfections: the calculation of the consensus forecast...
  - Uninformed traders ''jumping on the bandwagon''

Q2:Causes of Preannouncement Price Drift–Private Info

- 2 aspects of the release process that may affect Info Leakage

  - Organization type: organizations subject to PFEI guidelines(13); others(7)

  - Release procedures: no prerelease(4);prerelease in "lock-up
    rooms"(13);prerelease electronically(3)

- Equation:

$$R_t = \beta_0 + \sum_{j=1}^{2} \beta_j R_{j,t-1} + \sum_{k=-1}^{5} [\gamma_k \overline{S}_{t+k} + \sum_{i=1}^{3} \delta_{i,k} \overline{X}_{i,t+k}] + \epsilon_t$$

- $X^1_{m,t} = \mathbf{1}_{\text{PFEI organization}}$, $X^2_{m,t} = \mathbf{1}_{\text{prereleased}}$, $X^3_{m,t} = \mathbf{1}_{\text{embargo only}}$

- $\overline{S}_t = \sum_{m=1}^{M} \tilde{S}_{m,t} / \sum_{m=1}^{M} \mathbf{1}(|\tilde{S}_{m,t}| > 0)$, $\tilde{S}_{m,t}$ is sign-adjusted $S_{m,t}$

- $\overline{X}_{i,t} = \sum_{m=1}^{M} [\tilde{S}_{m,t} \mathbf{1}(X^i_{m,t} = 1)] / \sum_{m=1}^{M} \mathbf{1}(|\tilde{S}_{m,t}| > 0)$

Q2:Causes of Preannouncement Price Drift–Public Info

	E-Mini S&P 500		10-Year Treasury Note	
Variable	1	2	3	4
SURPRISE	0.028 (0.007)***	0.032 (0.006)***	−0.014 (0.003)***	−0.015 (0.003)***
PFEI	−0.057 (0.013)***	−0.025 (0.008)***	0.017 (0.005)***	0.008 (0.004)**
PRERELEASE	0.040 (0.014)***	NA	−0.011 (0.006)**	NA
EMBARGO_ONLY	NA	0.034 (0.012)***	NA	−0.012 (0.006)**

- Announcements subject to the PFEI are less affected by the drift.

- Prereleasing announcements is associated with a stronger drift,in particular to the least secure release procedure

New ideas

- Different countries have different regulations and supervisory structures.

- This effect may increase with the development of AI

- How to illustrate the harm caused by data leakage?

- Data leakage in other research themes