Retail Attention, Institutional Attention

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Background——Rational Inattention(RI)

- Background
  - a wealth of information creates a poverty of attention
- Assumption:
  - Humans cannot pay full attention to all available information, but can choose which to attend to
- what determines investors' attention?
  - investors' attention capacity
  - the nature of news
  - the extent to which investors can adjust their attention capacity in anticipation of the news
  - ……

Motivation

- The arrival of information doesn't ensure it is processed; how information is integrated into prices is crucial
- The relative role of retail and institutional investors on processing information can be more nuanced
  - Retail investors: contribute to mispricing but may possess value-relevant information about firms(Boehmer et al.,2021)
  - Institution: facilitate the incorporation of news(Ben-Rephael et al.,2017;Ben-Rephael et al.,2021)
- idea： This paper investigate the retail and institutional investors' attention response and stock prices reaction to the arrival of macro news and firm-specific news

Question

- Are retail and institutional investors' attention response different to news?
  - Yes, for the joint arrival of the macro and firm specific news
- Could the investors' attention-news patterns influence the asset prices incorporate information?
  - Yes
- Could the market-wide uncertainty and the extent to which investors can anticipate news influence investors' attention-news patterns?
  - Yes

Contribution

- Provides new insights into the roles retail(Yuan,2015) and institutional investors play in financial markets
  - Retail investors linked to delayed news incorporation
  - Confirms the efficiency-improving role of institutions
- Help to provide a more comprehensive picture of investor attention to news(Hirshleifer and Sheng(2021))
  - Use direct measures of investor attention and provides a microfoundation for the attention-news pattern
  - Offer a broader characterization of contexts where enhancement or crowding-out effects arise.
- Add new insights into how news affects asset price
- Provide evidence for the different constraints the retail investors and institutions face

Hypothesis

- In response to information shocks, investors devote more attention to processing relevant information(Gondhi,2021)
- When investors' attention constraints are binding, the arrival of market-wide shocks crowd out attention to firm-specific news, especially during periods of high uncertainty. For investors whose attention constraint is not binding, market-wide shocks do not exhibit the crowding-out effect and may even increase firm-specific attention.

Hypothesis

- For a stock whose marginal investors are attention constrained, concurrent macro news reduces price responsiveness to earnings news and increases the post-announcement drift, especially during periods of greater aggregate uncertainty , whereas if the marginal investor is unconstrained, the macro news does not distract or it may increase investor attention to the earnings news, resulting in greater return responses
- Compared to scheduled news, unscheduled firm-level news is more likely to be crowded out by macro-news announcements.

Data:Investor Attention Proxies

- Daily retail investor attention:
  - SVI： Search Volume Index from Google since 2004
  - $$RETAIL\_ATTN_i = \frac{SVI - SVI_{past\_year\_mean}}{SVI_{past\_year\_mean}} \quad (1)$$
- Daily abnormal institutional attention:
  - Daily readership data from Bloomberg since Feb. 2010
  - M: the maximum of the hourly user activities; F: the past sample distribution of the stock.
  - *INST_ATTNi* equals 0,1,2,3,4 if $M < q(F, 0.8)$, $q(F, 0.9) \leq M < q(F, 0.9)$, $q(F, 0.90) \leq M < q(F, 0.94)$, $q(F, 0.94) \leq M < q(F, 0.96)$ and $M \geq q(F, 0.96)$
- Attention to overall market

Data: News

- macro news($MACRO_t$)
  - GDP, NFP, PPI, FOMC and ISM announcements from Bloomberg
- firm-specific news($EADAY_{i,t}$):
  - IBES or Merged CRSP-Compustat database
  - define event day as day 0 if the announcement is made during trading hours, yet the next trading day
- Unscheduled firm news:
  - analysts' earnings forecast revisions
- Three definitions of news indicator variable
  - equals 1 if day t is the day proceeding an announcement
  - equals 1 if day t is the announcement day
  - equals 1 if day t is within the [-1,0] window

Data: Other Variables

- Quarterly standardized unexpected earnings (SUE):

$$SUE = \frac{EPS_{real} - EPS_{fore}}{Price} \tag{2}$$

- Stock Price reaction variables:
  - Immediate price reaction: CAR[0],CAR[1],CAR[0,1]
  - Post earnings announcement drifts(PEAD):CAR[1,40],CAR[1,60],CAR[2,60]
- Analysts' earnings forecast revisions($|REVISION|$)

$$REVISION = \frac{EPS_{new} - EPS_{old}}{EPS_{old}} \times 100\% \tag{3}$$

Regression

- News and Investor Attention
  - Attention to Firm-Level News: all firm-day observations

$$ATTENTION_{i,t} = \alpha_0 + \alpha_1 \times EADAY_{i,t} + \gamma \times Z_{i,t-1} + \epsilon_{i,t} \quad (4)$$

  - Attention to Macroeconomic News: daily observations

$$ATTENTION_{m,t} = \alpha_0 + \alpha_1 \times MACRO_t + \alpha_2 \times I_t^{HIGH\_EA} + \gamma Z_{t-1} + \epsilon_{m,t} \quad (5)$$

  - The Joint Arrival of Macro and Firm-specific News: observations around earnings announcement

$$ATTENTION_{i,t} = \alpha_0 + \alpha_1 \times MACRO_t + \gamma Z_{i,t-1} + \epsilon_{i,t} \quad (6)$$

Regression

- Market reactions to earnings announcements

$$
\begin{aligned}
CAR_{i,t} = \alpha &+ \alpha_1 \times SUE\_TOP_{i,t} \times MACRO_t \times RETL_{i,t-1} \\
&+ \alpha_2 \times SUE\_TOP_{i,t} + \alpha_3 \times SUE\_TOP_{i,t} \times RETL_{i,t-1} \\
&+ \alpha_4 \times SUE\_TOP_{i,t} \times MACRO_t + \alpha_5 \times RETL_{i,t-1} \\
&+ \alpha_6 \times MACRO_t + \alpha_7 \times MACRO_t \times RETL_{i,t-1} \\
&+ \gamma \times Z_{i,t-1} + \epsilon_{i,t} \qquad (7)
\end{aligned}
$$

- Sample:observations around earnings announcement

News and Investor Attention

- Investor Attention to Individual Stocks

	LN_RETAIL_ATTN$_i$			INST_ATTN$_i$		
	1	2	3	4	5	6
	[−1]	[0]	[−1,0]	[−1]	[0]	[−1,0]
EADAY$_{i,t}$	0.042***	0.050***	0.048***	1.310***	2.252***	1.786***
	(7.98)	(8.92)	(9.09)	(44.13)	(74.06)	(72.36)

- Attention to Macroeconomic News

	LN_RETAIL_ATTN$_m$			LN_INST_ATTN$_m$		
	1	2	3	4	5	6
	[−1]	[0]	[−1,0]	[−1]	[0]	[−1,0]
MACRO$_t$	−0.013	0.039*	0.017	−0.028	0.081***	0.032*
	(−0.60)	(1.78)	(0.99)	(−1.55)	(3.49)	(1.84)

- The arrival of firms-specific and macro news trigger substantial attention to the announcing firms and to the overall market, respectively, from both retail and institutional investors.

News and Investor Attention

- Joint Arrival of Macro News and Firms' Earnings News

	LN_RETAIL_ATTN$_i$			INST_ATTN$_i$		
	1	2	3	4	5	6
	[−1]	[0]	[−1,0]	[−1]	[0]	[−1,0]
MACRO$_t$	−0.021*	−0.026**	−0.023**	0.420***	−0.145***	0.133***
	(−1.88)	(−2.18)	(−2.11)	(4.11)	(−2.67)	(2.68)
ln(SIZE)$_{i,t-1}$	0.021***	0.032***	0.027***	0.239***	0.375***	0.305***
	(4.25)	(6.27)	(5.53)	(12.60)	(22.06)	(20.79)
BM$_{i,t-1}$	−0.007	−0.009	−0.008	−0.199***	−0.045	−0.123***
	(−0.73)	(−1.01)	(−0.89)	(−4.57)	(−1.35)	(−4.00)
RET$_{i,t-11}$	−0.194	0.291	−0.130	1.050	0.001	0.387
	(−0.77)	(1.26)	(−0.54)	(1.64)	0.00	(0.81)
ATURN$_{i,t-11}$	1.618**	0.418	1.105	8.582***	9.549***	4.824***
	(2.22)	(0.56)	(1.54)	(4.70)	(6.07)	(3.57)
IVOL$_{i,t-1}$	0.438	1.103*	0.789	28.795***	19.091***	23.734***
	(0.72)	(1.84)	(1.39)	(12.30)	(9.83)	(13.24)
IO$_{i,t-1}$	−0.005	−0.039	−0.022	0.742***	1.082***	0.915***
	(−0.19)	(−1.49)	(−0.86)	(7.50)	(13.30)	(12.87)
ANALYST$_{i,t-1}$	0.002	0.003***	0.002**	0.033***	0.007**	0.021***
	(1.48)	(2.58)	(2.07)	(8.83)	(2.34)	(7.00)
REPORT_LAG$_{i,t}$	−0.000	0.00	−0.000	−0.002	0.006***	0.002
	(−0.58)	(−0.22)	(−0.44)	(−0.90)	(2.64)	(0.88)
|SUE|$_{i,t}$	0.290	−0.488	−0.072	−2.768	5.407**	1.211
	(0.36)	(−0.53)	(−0.09)	(−0.99)	(2.34)	(0.58)
MRET$_{t-1}$	0.234	−0.610*	0.113	−0.929	2.109	0.954
	(0.79)	(−1.82)	(0.41)	(−0.21)	(0.86)	(0.43)

- Retail investors: crowding-out effect
- Institutions: enhancement effect

News and Investor Attention

- Market-Wide Uncertainty

	$LN\_RETAIL\_ATTN_{i,t}$		$INST\_ATTN_{i,t}$	
	High VIX	Low VIX	High VIX	Low VIX
	1	2	3	4
$MACRO_t$	−0.030*	−0.016	0.153**	0.120*
	(−1.82)	(−1.23)	(2.24)	(1.74)
$\ln(SIZE)_{i,t-1}$	0.021***	0.037***	0.325***	0.260***
	(3.64)	(5.81)	(16.49)	(17.13)
$BM_{i,t-1}$	−0.002	−0.013	−0.122***	−0.098**
	(−0.18)	(−1.05)	(−3.62)	(−2.55)
$RET_{i,t-1}$	−0.199	0.007	−0.496	1.817***
	(−0.74)	(0.01)	(−0.77)	(2.78)
$ATURN_{i,t-1}$	1.606**	0.601	5.472***	3.230**
	(2.21)	(0.42)	(2.81)	(1.98)
$IVOL_{i,t-1}$	0.368	2.379**	23.817***	23.695***
	(0.57)	(2.26)	(9.95)	(11.65)
$IO_{i,t-1}$	−0.004	−0.039	1.009***	0.824***
	(−0.11)	(−1.59)	(11.95)	(9.64)
$ANALYST_{i,t-1}$	0.002	0.002	0.021***	0.021***
	(1.64)	(1.48)	(5.30)	(7.58)
$REPORT\_LAG_{i,t}$	0.000	−0.001	0.004*	−0.002
	(0.23)	(−1.02)	(1.66)	(−1.01)
$\lvert SUE\rvert_{i,t}$	−0.385	0.761	1.555	2.758
	(−0.41)	(0.51)	(0.57)	(1.10)
$MRET_{t-1}$	−0.002	0.500	−1.187	−5.379
	(−0.01)	(0.57)	(−0.47)	(−1.23)

- The attention-news pattern is more effective during periods of greater macro economic uncertainty

Market Reactions to Earnings Announcements

	CAR						
	[0]	[1]	[1,10]	[1,20]	[1,40]	[1,60]	[2,60]
	1	2	3	4	5	6	7
$SUE\_TOP_{i,t} \times MACRO_t \times RETL_{i,t-1}$	−1.616**	0.382	1.126	1.194	3.375*	5.401**	5.047**
	(−2.30)	(0.96)	(1.16)	(0.87)	(1.79)	(2.18)	(2.11)
$SUE\_TOP_{i,t}$	6.196***	1.098***	2.766***	3.464***	4.618***	5.433***	4.168***
	(55.53)	(18.90)	(19.09)	(17.17)	(15.98)	(15.10)	(12.01)
$SUE\_TOP_{i,t} \times RETL_{i,t-1}$	−1.558***	−0.476**	−1.497***	−1.304**	−2.469***	−2.356**	−1.866*
	(−5.02)	(−2.41)	(−3.49)	(−2.12)	(−2.79)	(−2.16)	(−1.74)
$SUE\_TOP_{i,t} \times MACRO_t$	0.571**	−0.047	−0.465	−0.553	−1.247**	−1.332*	−1.188*
	(2.40)	(−0.39)	(−1.52)	(−1.33)	(−2.11)	(−1.88)	(−1.72)

- For high retail ownership,earnings announcements with concurrent macro news are associated with larger PEAD and lower announcement returns

Market Reactions to Earnings Announcements

- The Effects of Economic Uncertainty

	CAR[0]		CAR[1,60]	
	High VIX	Low VIX	High VIX	Low VIX
	1	2	3	4
$SUE\_TOP_{i,t} \times MACRO_t \times RETL_{i,t-1}$	−2.886***	−0.360	8.378**	2.209
	(−2.88)	(−0.38)	(2.32)	(0.67)
$SUE\_TOP_{i,t}$	5.877***	6.520***	6.426***	4.457***
	(34.51)	(45.85)	(11.29)	(10.51)
$SUE\_TOP_{i,t} \times RETL_{i,t-1}$	−1.737***	−1.306***	−3.423**	−1.393
	(−4.13)	(−2.83)	(−2.18)	(−0.93)
$SUE\_TOP_{i,t} \times MACRO_t$	0.947***	0.215	−3.283***	0.702
	(2.62)	(0.68)	(−2.96)	(0.80)
$RETL_{i,t-1}$	−0.322	−0.014	−2.132*	−4.132***
	(−1.06)	(−0.05)	(−1.95)	(−3.97)
$MACRO_t$	−0.691***	−0.173	0.925	−0.057
	(−2.80)	(−0.76)	(1.07)	(−0.09)
$MACRO_t \times RETL_{i,t-1}$	1.300*	0.049	−5.116**	−0.350
	(1.95)	(0.07)	(−2.24)	(−0.18)
Fixed effects	Day-of-Week, Month-of-year			
Controls	+	+	+	+
Adj. R^2	0.120	0.165	0.021	0.024
N	17,230	16,767	17,229	16,767

- Retail investors: More uncertainty, more underreaction to firm-specific news and greater PEAD

Unscheduled Firm News

- Sample: days with analysts' earnings forecast revisions

	$LN\_RETAIL\_ATTN_i$		$INST\_ATTN_i$	
	1	2	3	4
$MACRO_t$	−0.024***	−0.024***	−0.019	−0.012
	(−2.86)	(−2.75)	(−1.02)	(−0.69)
$\ln(SIZE)_{i,t-1}$	0.000	0.008***	0.229***	0.301***
	(−0.08)	(3.06)	(57.23)	(48.89)
$BM_{i,t-1}$	−0.009	−0.004	0.105***	0.103***
	(−1.55)	(−0.73)	(8.89)	(9.11)
$RET_{i,t-1}$		0.001		0.015***
		(1.02)		(4.53)
$ATURN_{i,t-1}$		3.524***		38.963***
		(11.34)		(60.18)
$IVOL_{i,t-1}$		−0.016***		0.282***
		(−4.86)		(32.24)
$IO_{i,t-1}$		−0.008		−0.010
		(−0.62)		(−0.43)
$ANALYST_{i,t-1}$		−0.004***		0.010***
		(−7.66)		(10.18)
$\lvert REVISION_{i,t} \rvert$		0.0001*		0.0003**
		(1.70)		(2.18)
$MRET_{i,t-1}$		−0.0023		0.0226***
		(−0.93)		(3.54)

- Retail investors: crowding-out effect
- institutions: no enhancement effect

Unscheduled Firm News

- Sample: days with analysts' earnings forecast revisions

	CAR						
	[0]	[1]	[0,1]	[2,10]	[2,20]	[2,40]	[2,60]
	1	2	3	4	5	6	7
$REVISION\_DECILE_{i,t} \times MACRO_t \times RETL_{i,t-1}$	−0.020	−0.035***	−0.049**	0.002	0.043	0.084	0.106**
	(−1.28)	(−2.78)	(−2.47)	(0.08)	(0.57)	(1.41)	(2.06)
$REVISION\_DECILE_{i,t}$	0.075***	0.039***	0.115***	0.054***	0.069***	0.081***	0.101***
	(23.15)	(14.82)	(27.33)	(7.40)	(5.52)	(5.03)	(5.75)
$REVISION\_DECILE_{i,t} \times RETL_{i,t-1}$	−0.003	−0.001	−0.005	0.022	0.100***	0.204***	0.203***
	(−0.54)	(−0.12)	(−0.64)	(1.61)	(4.34)	(6.87)	(6.25)
$REVISION\_DECILE_{i,t} \times MACRO_t$	0.027***	0.001	0.024**	−0.001	0.003	0.006	0.041
	(3.23)	(0.13)	(2.24)	(−0.05)	(0.10)	(0.15)	(0.90)
$RETL_{i,t-1}$	0.058	0.040	0.100**	−0.216**	−0.677***	−1.361***	−1.432***
	(1.52)	(1.33)	(2.05)	(−2.54)	(−4.68)	(−7.30)	(−7.03)
$MACRO_t$	−0.147***	−0.012	−0.131*	0.141	−0.010	−0.034	−0.275
	(−2.82)	(−0.29)	(−1.95)	(1.21)	(−0.05)	(−0.13)	(−0.98)
$MACRO_t \times RETL_{i,t-1}$	0.062	0.116	0.142	−0.725***	−0.369	0.387	0.228
	(0.64)	(1.49)	(1.14)	(−3.35)	(−1.00)	(0.81)	(0.44)
Fixed effect	Day-of-Week, Month-of-Year						
Controls	+	+	+	+	+	+	+
Adj. R^2	0.004	0.001	0.005	0.002	0.002	0.003	0.003
N	306,958	306,958	306,958	305,377	305,377	305,377	305,377

- Lower immediate price response and higher PEAD for stocks dominated by retail investors.

Conclusion

- Attention-news pattern to the joint arrival of macro news and firm news：
  - Retail investors:crowding-out effect
  - Institution: enhancement effect only for scheduled earnings
- The stocks dominated by retail investors incorporate firm-specific news more slowly with the macro news arrival，yet stocks dominated by institutions.
- The attention-pattern is more effective during the periods of high market-wide uncertainty
- The attention-pattern does not hold for unscheduled forecast revisions.

New ideas

- Other stories of the rational inattention model:
  - investor $\rightarrow$managers(Naveen Gondhi, 2023) or government
  - information
    - industry information
    - other kinds of macro information: policy
    - positive macro news or negative macro news
  - ……