Under the Spotlight: How External Informed Traders Impact Share Repurchases

Hongyi Xu

Stockholm School of Economics

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Motivation

- Rising share repurchase amounts.

  "In 2021, buybacks amounted to nearly $950 billion and reportedly reached more than $1.25 trillion in 2022,"

  - SEC Chair Gary Gensler

Motivation

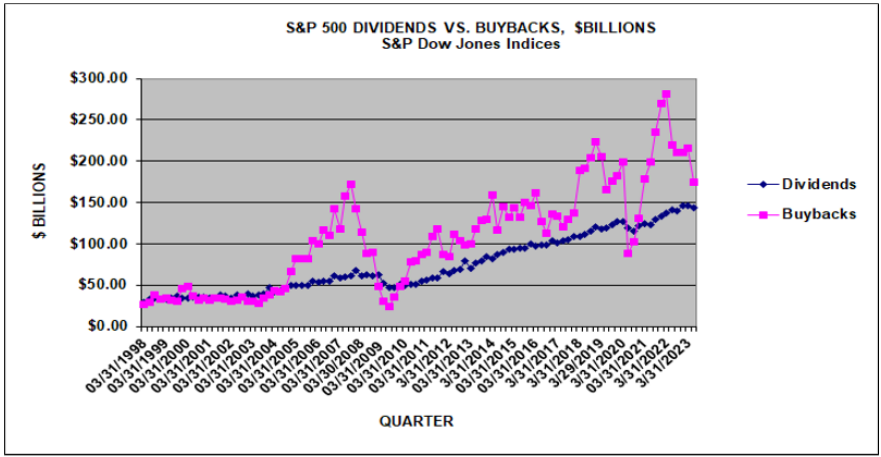

Figure: S&P500 Quarterly Share Repurchases and Dividends (in billion dollar)

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- Focus on the managers' incentives
  - inflate stock prices.
  - manipulate financial ratios, e.g. EPS, ROA, ROE, ROIC.
  - undervaluation
  - price support motive

Motivation

Question:

- Does the participation of other agents influence the manager's share repurchase decision?

Key Results

THEORY:

- Introduce the “external informed trader”
  - predict that external informed trader’s participation $\uparrow \Rightarrow$ share repurchases $\downarrow$

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- Utilize firm-level institutional investor attention. (Ben-Rephael, Da, and Israelsen 2017)
  - Use abnormal institutional investor attention (AIA) to proxy for the participation of “external informed traders” in the market.

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  - predict that external informed trader's participation $\uparrow \Rightarrow$ share repurchases $\downarrow$

EMPIRICAL:

- Utilize firm-level institutional investor attention. (Ben-Rephael, Da, and Israelsen 2017)
  - Use abnormal institutional investor attention (AIA) to proxy for the participation of "external informed traders" in the market.

- Higher abnormal institutional investor attention leads to a reduction in the amount and the probability of share repurchases.
  - one within-firm $\sigma_{AIA} \uparrow$ leads to an approximate 10% reduction in monthly share repurchase intensity relative to the average level (0.31%).
  - one within-firm $\sigma_{AIA} \uparrow$ reduces the probability of repurchasing shares by 1.5pp.

Literature

Share Repurchases

- Brav et al. (2005), Brockman, Khurana, and Martin (2008), Hong, J. Wang, and Yu (2008), Gaspar et al. (2013), Dittmar and Field (2015), Hillert, Maug, and Obernberger (2016), Liu and Swanson (2016), Almeida, Fos, and Kronlund (2016), Ferri and N. Li (2020), Edmans, Fang, and Huang (2022), Busch and Obernberger (2016), and Dittmann et al. (2022)

Investor Engagement and Informativeness

- Admati and Pfleiderer (2009), Edmans (2009), Duan and Jiao (2016), McCahery, Sautner, and Starks (2016), Dasgupta, Fos, and Sautner (2021), Gantchev and Giannetti (2021), Goldman and W. Wang (2021), Iliev, Kalodimos, and Lowry (2021), S. Z. Li, Maug, and Schwartz-Ziv (2022), and Meirowitz and Pi (2022)

Investor Attention

- Da, Engelberg, and Gao (2011), Sicherman et al. (2016), Ben-Rephael, Da, and Israelsen (2017), Loughran and McDonald (2017), Peress and Schmidt (2020), Focke, Ruenzi, and Ungeheuer (2020), and Iliev, Kalodimos, and Lowry (2021)

Conceptual Framework - Intuition

framework

- Case 1: Manager + Liquidity traders
  - the manager as the sole trader with private information.
  - the undervalued firm repurchases more shares than the overvalued firm.

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  - the external informed trader has a noisy private signal. $\Rightarrow$ price informativeness $\uparrow$.
  - undervalued firm: increased competition $\rightarrow$ higher prices $\rightarrow$ fewer repurchases.
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$$\begin{cases} \text{marginal increase in the share price} \downarrow \\ \qquad\qquad \bigvee \qquad\qquad \rightarrow \text{fewer repurchases.} \\ \text{marginal cost of price manipulation} \downarrow \end{cases}$$

  - the informed trader's participation, ceteris paribus, reduces the share repurchase amount.

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  - the informed trader's participation, ceteris paribus, reduces the share repurchase amount.

$\star$ Main Prediction: the manager will buy back fewer shares when the external informed trader participates in the market.

Data

Data Constructions:

- Firm-level monthly share repurchases from 10-Q and 10-K filings ▸ detail
- Firm-level daily maximum readership score and daily max/average story flow from Bloomberg
- Stock-level trading information from CRSP
- Stock-level financial information from Compustat

Final Unbalanced Panel:

- Russell 3000 stock universe
- Firms with at least one active OMR program in the sample period
- February 2010 — December 2021
- 73,926 firm-month observations, 1,575 firms

Data - Abnormal Institutional Investor Attention

Firm-level Daily Maximum Readership (DMR): (Bloomberg) ▸ details:

- Users' hourly read & search frequency $\Rightarrow$ Hourly Attention Score
- DMR is the maximum hourly attention score within each calendar day. ▸ detail

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Firm-level Monthly Measures: (Ben-Rephael, Da, and Israelsen 2017) detail

- Firm-level Monthly Abnormal Institutional Investor Attention (AIA)

$$AIA_{i,m} = \frac{1}{N_m} \sum_{s=1}^{N_m} \textit{Discrete}\ DMR_{i,m,s}$$

- Firm-level Monthly Continuous Abnormal Institutional Investor Attention (AIAC)

$$AIAC_{i,m} = \frac{1}{N_m} \sum_{s=1}^{N_m} \textit{Continuous}\ DMR_{i,m,s}$$

Data - AIA and AIAC

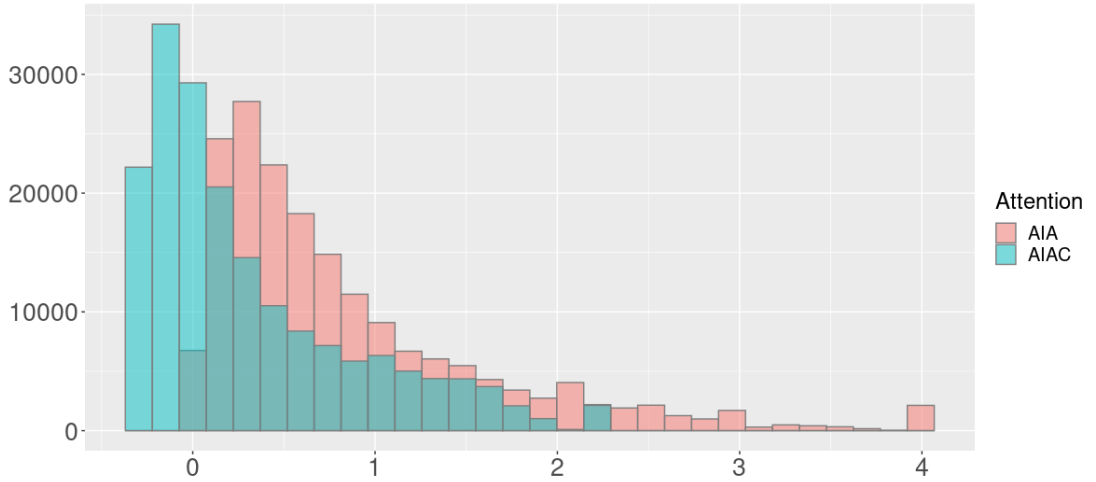

Figure: Histogram for AIA and AIAC

Methodology and Empirical Results

How does the repurchase intensity response to changes in attention?

$$RepIntensity_{i,t} = \alpha + \beta AIA_{i,t} + \delta RepIntensity_{i,t-1} + \sum_{l=1}^{N} \gamma_l Control_{i,l,t} + \mu_i + \eta_t + \varepsilon_{i,t}, \quad (1)$$

- $RepIntensity_{i,t}$ is the normalised actual share repurchase amount under the publicly announced program by firm i at time t.
  - Repurchase Intensity = # Share Repurchased / Last Month Share Outstanding
  - Repurchase Intensity (TV) = # Share Repurchased / Current Month Trading Volume
- Standard errors are clustered at firm level.

Methodology and Empirical Results - Panel OLS

Dependent Variable:	Repurchase Intensity = # Share Repurchased / Last Month Share Outstanding					
Model:	(1)	(2)	(3)	(4)	(5)	(6)
AIA_t	-0.0006***	-0.0006***	-0.0005***			
	(0.0001)	(0.0001)	(0.0001)			
$AIAC_t$				-0.0008***	-0.0009***	-0.0007***
				(0.0001)	(0.0001)	(0.0002)
Repurchase Intensity$_{t-1}$	0.1781***	0.1769***	0.1758***	0.1781***	0.1769***	0.1758***
	(0.0229)	(0.0243)	(0.0244)	(0.0229)	(0.0243)	(0.0244)
Amihud$_t$ (ln)	-0.0009***	-0.0021***	-0.0021***	-0.0009***	-0.0021***	-0.0021***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
$OMRFlag_t$	0.0016***	0.0016***	0.0016***	0.0016***	0.0016***	0.0016***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Return Controls	✓	✓	✓	✓	✓	✓
Fundamental Controls		✓	✓		✓	✓
Info Flow Controls			✓			✓
Firm Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed effects	Month	Month	Month	Month	Month	Month
Observations	41,730	39,836	39,470	41,730	39,836	39,470
R^2	0.24622	0.25699	0.25699	0.24623	0.25702	0.25703
R^2 (within)	0.04441	0.05630	0.05687	0.04442	0.05634	0.05692

Clustered (Ticker) standard-errors in parentheses and *Signif. Levels: ***: 1%, **: 5%, *: 10%*

Methodology and Empirical Results - Panel OLS

Dependent Variable:	Repurchase Intensity (*TV*) = # Share Repurchased / Trading Volume					
Model:	(1)	(2)	(3)	(4)	(5)	(6)
AIA_t	-0.0052***	-0.0053***	-0.0039***			
	(0.0005)	(0.0005)	(0.0005)			
$AIAC_t$				-0.0076***	-0.0077***	-0.0057***
				(0.0008)	(0.0008)	(0.0008)
Repurchase Intensity $(TV)_{t-1}$	0.2047***	0.2047***	0.2026***	0.2043***	0.2044***	0.2023***
	(0.0351)	(0.0372)	(0.0374)	(0.0351)	(0.0372)	(0.0374)
$Amihud_t$ (ln)	-0.0020***	-0.0039***	-0.0045***	-0.0021***	-0.0040***	-0.0046***
	(0.0005)	(0.0007)	(0.0007)	(0.0005)	(0.0007)	(0.0007)
$OMRFlag_t$	0.0071***	0.0071***	0.0077***	0.0071***	0.0070***	0.0077***
	(0.0015)	(0.0016)	(0.0016)	(0.0015)	(0.0016)	(0.0016)
Return Controls	✓	✓	✓	✓	✓	✓
Fundamental Controls		✓	✓		✓	✓
Info Flow Controls			✓			✓
Firm Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed effects	Month	Month	Month	Month	Month	Month
Observations	41,730	39,836	39,470	41,730	39,836	39,470
R^2	0.28374	0.28965	0.29125	0.28388	0.28981	0.29138
R^2 (within)	0.04901	0.05343	0.05570	0.04919	0.05365	0.05588

Clustered (Ticker) standard-errors in parentheses and *Signif. Levels: ***: 1%, **: 5%, *: 10%*

Methodology and Empirical Results - Instrument

Reverse causality is unlikely.

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External Market-wide AIA: average AIA in the market w/o firm *i*

Methodology and Empirical Results - Instrument

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Potential concern of omitted variables.

Limited investor attention $\Rightarrow$
External Market-wide AIA: average AIA in the market w/o firm i

$$MarketAIA_{i,t} = \frac{1}{|\Omega_t \setminus \{i\}|} \sum_{j \in \Omega_t \setminus \{i\}} AIA_{j,t}, \tag{2}$$

where Ω_t represents the set of firms in the Russell 3000 universe with a valid AIA/AIAC measure at time t.

Methodology and Empirical Results - 2SLS

$$AIA_{i,t} = \beta_0 + \beta_1 MarketAIA_{i,t} + \beta_2 RepIntensity_{i,t-1} + \sum_{l=1}^{N} \gamma_l Control_{i,l,t} + \mu_i + \eta_t + \varepsilon_{i,t} \quad \text{(FS)},$$

$$RepIntensity_{i,t} = \delta_0 + \delta_1 \widehat{AIA}_{i,t} + \delta_2 RepIntensity_{i,t-1} + \sum_{l=1}^{N} \theta_l Control_{i,l,t} + \mu_i + \eta_t + u_{i,t} \quad \text{(SS)},$$

Methodology and Empirical Results - 2SLS

Panel A: Instrumental Variable Estimation

Dependent Variables:	AIA		AIAC	
Model:	(1)	(2)	(3)	(4)
$MarketAIA_t$	-1,246.2***	-1,246.3***		
	(5.214)	(5.214)		
$MarketAIAC_t$			-1,234.8***	-1,234.9***
			(6.101)	(6.100)
F-test (First Stage)	49.443	102.10	48.645	102.73

Panel B: Second Stage Estimation

Dependent Variables:	Repurchase Intensity	Repurchase Intensity (*TV*)	Repurchase Intensity	Repurchase Intensity (*TV*)
Model:	(1)	(2)	(3)	(4)
Predicted AIA_t	-0.0006***	-0.0043***		
	(0.0001)	(0.0006)		
Predicted $AIAC_t$			-0.0008***	-0.0060***
			(0.0002)	(0.0008)
Observations	39,470	39,470	39,470	39,470
R^2	0.25698	0.29122	0.25702	0.29138

- Firm and time fixed effects are included in both stages.
- Same set of controls are included in both stages.

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Panel B: Second Stage Estimation

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R^2	0.25698	0.29122	0.25702	0.29138

- Firm and time fixed effects are included in both stages.
- Same set of controls are included in both stages.
- F-stat > 10 .
- Economic significance: one within-firm sd of AIA $\nearrow \Rightarrow \approx 0.03$pp $\searrow$ in Repurchase Intensity, on average. (=0.0006 $\times$ 0.43)

Methodology and Empirical Results - extensive margin

Dependent Variable:	Repurchase Dummy (0 / 1)			
	LPM	LPM	IV	IV
Model:	(1)	(2)	(3)	(4)
AIA_t	-0.0326***		-0.0341***	
	(0.0061)		(0.0070)	
$AIAC_t$		-0.0451***		-0.0460***
		(0.0091)		(0.0098)
Repurchase $Dummy_{t-1}$	0.3653***	0.3651***	0.3653***	0.3651***
	(0.0124)	(0.0124)	(0.0124)	(0.0124)
$Amihud_t$ (ln)	-0.0567***	-0.0573***	-0.0567***	-0.0573***
	(0.0081)	(0.0081)	(0.0081)	(0.0081)
$OMRFlag_t$	0.0813***	0.0812***	0.0814***	0.0812***
	(0.0147)	(0.0147)	(0.0147)	(0.0147)
Controls	✓	✓	✓	✓
Firm Fixed effects	Yes	Yes	Yes	Yes
Time Fixed effects	Month	Month	Month	Month
Observations	39,470	39,470	39,470	39,470
F-test (First Stage)			43.054	41.382
R^2	0.50686	0.50683	0.50686	0.50683

Conclusion

Contributions:

- Highlight external informed traders as a significant factor in managers' share repurchases.
- Use institutional attention as a proxy for the involvement of external informed traders in the market.
- The participation of external informed traders reduces both the amount and the probability of executing buybacks by the manager.
- Indicate that managers strategically abstain from repurchasing shares when their firms are under the spotlight.

Future Research:

- Look into undervalued versus overvalued firms. ▸ MORE
- Impact of retail investor attention.

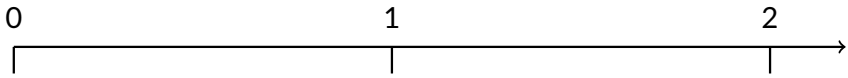
Appendix

Conceptual Framework - Players

For a firm that generates a signal cash flow $v = \{0, X\}$ with the prior $\mathbf{P}(v = X) = \frac{1}{2}$:

1. One corporate manager (M)
   - conducts an publicly announced Open Market Share Repurchase (OMR) program.
   - cares about both the stock price P_1 and terminal firm value P_2.
2. One blockholder (B)
   - holds a sufficient large minority interest $\alpha \in [0, \bar{a}], \bar{a} > 0$.
   - may exert research effort $\mu \in [0, 1]$ at cost $\frac{c}{2}\mu^2$.
     - when $\mu > 0$, B becomes an "external informed trader".
   - cares about her trading profits.
3. Atomistic liquidity traders/Households
   - collectively hold the rest of the shares $1 - \alpha$.
4. One competitive market maker
   - observes the aggregate order flow.
   - sets the price to make zero conditional expected profits ex ante.

Conceptual Framework - Timeline



Manager perfectly learns the quality of the firm

Blockholder exerts monitoring effort μ. and receives a noisy private signal $i \in \{i_g, i_b\}$ with $\mathbf{P}(i_g|X) = \mathbf{P}(i_b|0) = \frac{1+\mu}{2}$.

Trading:
Blockholder sells $b \in [0, \alpha]$.

Liquidity traders demand $u \sim \exp(\lambda)$.

Manager demands $m \in [0, \bar{R}]$.

Market maker observes $d = u - b + m$ and sets $P_1 = \mathbf{E}[V|d]$.

Firm cash flow v is realised

Firm terminal value is $P_2 = \frac{v-(1+r)mP_1}{1-m}$

Note: without time discounting and transaction costs, and all agents are risk-neutral. ▸ Intuition

Data - Monthly Share Repurchases

back

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS, AND ISSUER PURCHASES OF EQUITY SECURITIES

MARKET AND STOCKHOLDERS

Our common stock is traded on the NASDAQ Stock Market under the symbol MSFT. On July 27, 2020, there were 91,674 registered holders of record of our common stock.

SHARE REPURCHASES AND DIVIDENDS

Following are our monthly share repurchases for the fourth quarter of fiscal year 2020:

Period	Total Number of Shares Purchased	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximate Dollar Value of Shares That May Yet be Purchased Under the Plans or Programs
				(In millions)
April 1, 2020 – April 30, 2020	8,906,563	$ 165.90	8,906,563	$ 35,323
May 1, 2020 – May 31, 2020	9,655,700	182.31	9,655,700	33,563
June 1, 2020 – June 30, 2020	9,648,400	191.80	9,648,400	31,712
	28,210,663		28,210,663	

All share repurchases were made using cash resources. Our share repurchases may occur through open market purchases or pursuant to a Rule 10b5-1 trading plan. The above table excludes shares repurchased to settle employee tax withholding related to the vesting of stock awards.

Figure: An excerpt from Microsoft's 10-K filing in 2020

Data - Monthly Share Repurchases

back

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Share Repurchased*

Period Info

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Footnotes

Figure: An excerpt from Microsoft's 10-K filing in 2020

Data - Monthly Share Repurchases

back

item	period	variable	value	unit
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April 1, 2020 – April 30, 2020	April 1, 2020 – April 30, 2020	D$- Approximate Dollar Value of Shares That May Yet be Purchased Under the Plansor Programs	35,323	(in millions)
May 1, 2020 – May 31, 2020	May 1, 2020 – May 31, 2020	D$- Approximate Dollar Value of Shares That May Yet be Purchased Under the Plansor Programs	33,563	(in millions)
June 1, 2020 – June 30, 2020	June 1, 2020 – June 30, 2020	D$- Approximate Dollar Value of Shares That May Yet be Purchased Under the Plansor Programs	31,712	(in millions)
	June 1, 2020 – June 30, 2020	D$- Approximate Dollar Value of Shares That May Yet be Purchased Under the Plansor Programs		(in millions)

Table: Cleaned share repurchases data

Data - Abnormal Institutional Investor Attention

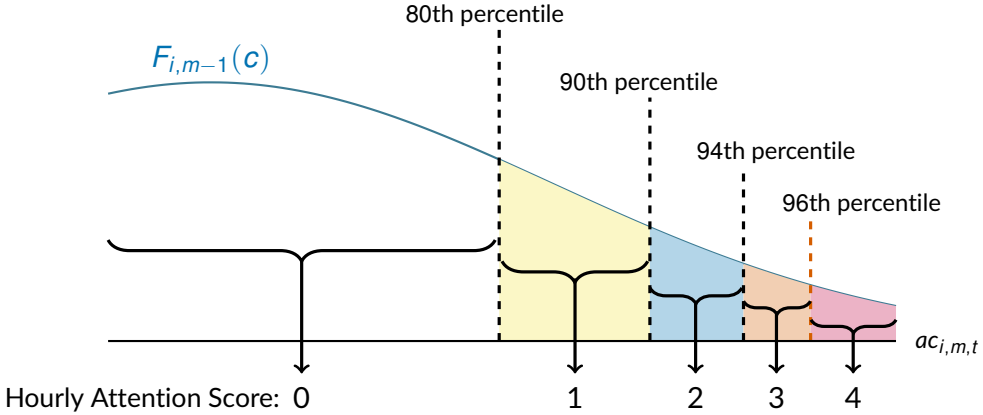
Firm-level Daily Maximum Readership (Bloomberg):

- Hourly Read & Search Frequency $\rightarrow \begin{cases} \text{Search} = 10 \\ \text{Read} = 1 \end{cases}$ $\Rightarrow$ Hourly Counts $c_{i,m,t} \Rightarrow$ 8-hour Average Counts $ac_{i,m,t} = \frac{1}{8}\sum_{s=t-7}^{t} c_{i,m,s}$

- Hourly Attention Score = $\begin{cases} 0 & \text{, if } F_{i,m-1}(ac_{i,m,t}) \leq 80\% \\ 1 & \text{, if } F_{i,m-1}(ac_{i,m,t}) \in (80\%, 90\%] \\ 2 & \text{, if } F_{i,m-1}(ac_{i,m,t}) \in (90\%, 94\%] \\ 3 & \text{, if } F_{i,m-1}(ac_{i,m,t}) \in (94\%, 96\%] \\ 4 & \text{, if } F_{i,m-1}(ac_{i,m,t}) > 96\% \end{cases}$,
  where $F_{i,m-1}(c)$ is the CDF of past-month hourly counts for firm i.

- Daily Maximum Readership (DMR) is the maximum hourly attention score within each calendar day.

Data - Abnormal Institutional Investor Attention



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Data - Abnormal Institutional Investor Attention

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Firm-level Monthly Measures: (Ben-Rephael, Da, and Israelsen 2017)

- Firm-level Monthly Abnormal Institutional Investor Attention (AIA)

$$AIA_{i,m} = \frac{1}{N_m} \sum_{s=1}^{N_m} \textit{Discrete}\ DMR_{i,m,s}$$

- Firm-level Monthly Continuous Abnormal Institutional Investor Attention (AIAC)

$$AIAC_{i,m} = \frac{1}{N_m} \sum_{s=1}^{N_m} \textit{Continuous}\ DMR_{i,m,s}$$

N_m is the total number of calendar days with valid DMR values in month m.

Discrete DMR	0	1	2	3	4
Continuous DMR	-0.350	1.045	1.409	1.647	2.154

Subgroup Analysis - undervalued versus overvalued firms

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Dependent Variable:	Repurchase Intensity			
	CAR (current month)	CAR (1-month)	CAR (3-month)	CAR (6-month)
Model:	(1)	(2)	(3)	(4)
AIA $\times$ (CAR $\leq$ 0)	-0.0008***	-0.0007***	-0.0009***	-0.0008***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
AIA $\times$ (CAR $>$ 0)	-0.0004**	-0.0005**	-0.0003	-0.0004*
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
(CAR $>$ 0)	-0.0005	-0.0001	-0.0003	-0.0001
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Controls	✓	✓	✓	✓
Firm Fixed effects	Yes	Yes	Yes	Yes
Time Fixed effects	Month	Month	Month	Month
Observations	32,800	32,847	32,847	32,847
R^2	0.26024	0.26055	0.25966	0.25995
Within R^2	0.05376	0.05406	0.05293	0.05330

Clustered (Ticker) standard-errors in parentheses and *Signif. Levels: ***: 1%, **: 5%, *: 10%*