

Attention Triggers and Retail Investors' Risk Taking

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Risk taking and investor attention

- Explaining the risk taking behavior of individuals is fundamental to a better understanding of financial markets (Liu et al., 2010; Charness and Gneezy, 2012).
- Behavioral factors such as personal experiences or beliefs are a key driver of the heterogeneity in individuals' willingness to take risk (e.g., Malmendier and Nagel, 2011).
- Recent behavioral studies highlight the importance of individual attention as an important cognitive pathway both to evaluate experiences and form beliefs.
- Literature explores how individuals allocate their attention and how attention influences trading (Sicherman et al., 2015; Gargano and Rossi, 2018), but leaves the link between individual attention and risk taking unexplored.
- Main challenge: Difficulty of **identifying individual attention triggers** and **empirically isolating the impact of these triggers** on individual risk taking.
- We exploit a novel dataset containing the trading records of a brokerage service that sends **standardized push notifications** to some of its client investors.
- Thus, we observe a trigger of individual investor attention (the push notification) that we can directly link to their trading behavior and risk taking.



How does individual investor attention affect individuals' risk taking?

Push notification content

\$AFSI shares down over -5.2%.

Main findings

1. Attention trades bear a **higher leverage** compared to non-attention trades: **Attention stimulates risk taking**.
2. **Male, younger, and less experienced investors** particularly increase their risk taking after an attention stimulus.
3. Attention triggers have a stronger impact on risk taking for **stocks with more public information** and **higher valuation uncertainty**.

Data

- Trading data (Jan. 2016 - March 2018) from a discount brokerage firm offering financial services to its customers under a UK broker license.
- Broker allows its international customer-base to trade **CFDs** on a large set of blue chip companies traded at the major stock exchanges in Europe and the US.
- **CFDs allow investors to select the leverage of their trades**—a major catalyst of speculative trading: **key dimension of risk taking that is not determined by the selection of the stock itself**.
- In 2017, the broker started sending standardized push notifications to its client investors.
- Push notifications only contain public information (i.e., past returns).
- The broker determines which customers receive notifications.
- Each push notification is sent to approx. 2,000 investors; other investors do not receive specific push notification.
- Almost all investors (99.1%) have received at least one push notification.

Methodology (difference-in-differences setting)

- Compare the trading behavior of investors with a push notification (attention trigger) to that of investors without a push notification in the **same stock** at the **same time**.
- Treatment: Trader receives push notification in given stock for the first time.
- Observation period: 7 days prior to treatment; treatment period: 24 hours after treatment.
- Comparable investors: Did not receive push notification yet and do not receive one within treatment period.

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Empirical analysis

Difference-in-differences analysis of leverage

	diff-in-diff	diff-in-diff-in-diff
	Leverage	Leverage
treat	0.0256 (4.1351)	0.0483 (7.1693)
post	-0.0012 (-0.0757)	0.0319 (8.4588)
stock		0.0608 (6.0127)
treat × post	0.1277 (5.6310)	0.0197 (2.0216)
treat × stock		-0.0950 (-5.1160)
post × stock		-0.0672 (-4.0041)
treat × post × stock		0.1801 (5.8745)
Investor-fixed effects	Yes	Yes
Stock-fixed effects	Yes	Yes
Time-fixed effects	Yes	Yes
Obs.	1,463,270	2,596,080
Adj. R ²	0.61	0.62

t-statistics in parentheses.

- The increase accounts for 4% of the standard deviation of leverage and for 6.8% of the standard deviation at the investor level (within variation) (based on diff-in-diff analysis).

Investors' risk taking over time

- We compare investors' risk taking for the time period before push notifications were sent (01-01-2016 to 02-26-2017) and the push-notification regime (02-27-2017 to 03-31-2018).
- Analysis is restricted to trades executed after push notifications and an absolute stock price change of at least 3% (i.e. the threshold for the broker to send push notifications in the push notification regime), respectively.

	Leverage
Push notification regime	1.0126 (4.6781)
Obs.	318,486
Adj. R ²	0.11

t-statistics in parentheses.

Robustness analyses

- Main concern: the broker's notification sending behavior could affect our conjecture.
- The broker may anticipate changes in investors' risk taking and send push notifications accordingly.
- Diff-in-diff-in-diff analysis accounts for anticipated changes in risk taking for specific investors and specific stocks, but not for the combination of the two.
- Most likely source of information for the broker: Investors research a given stock.
- Hence, we exclude all investors who research a given stock before push notifications are sent.
- Additional tests:
 - require control investors to click on different push notifications shortly before and after treatment event (i.e., make sure they are indeed comparable).
 - only consider very first push notification ever.
 - perform a matching procedure based on investors' previous risk taking.
 - control for news and notification content (positive/negative, small vs. large stock price change).
- Our findings are robust to these alternative specifications.

Additional findings

- Attention triggers also increase
 - **trading intensity,**
 - **short selling,**
 - and **research activity / information acquisition.**