Violence and investor behavior: Evidence from terrorist attacks

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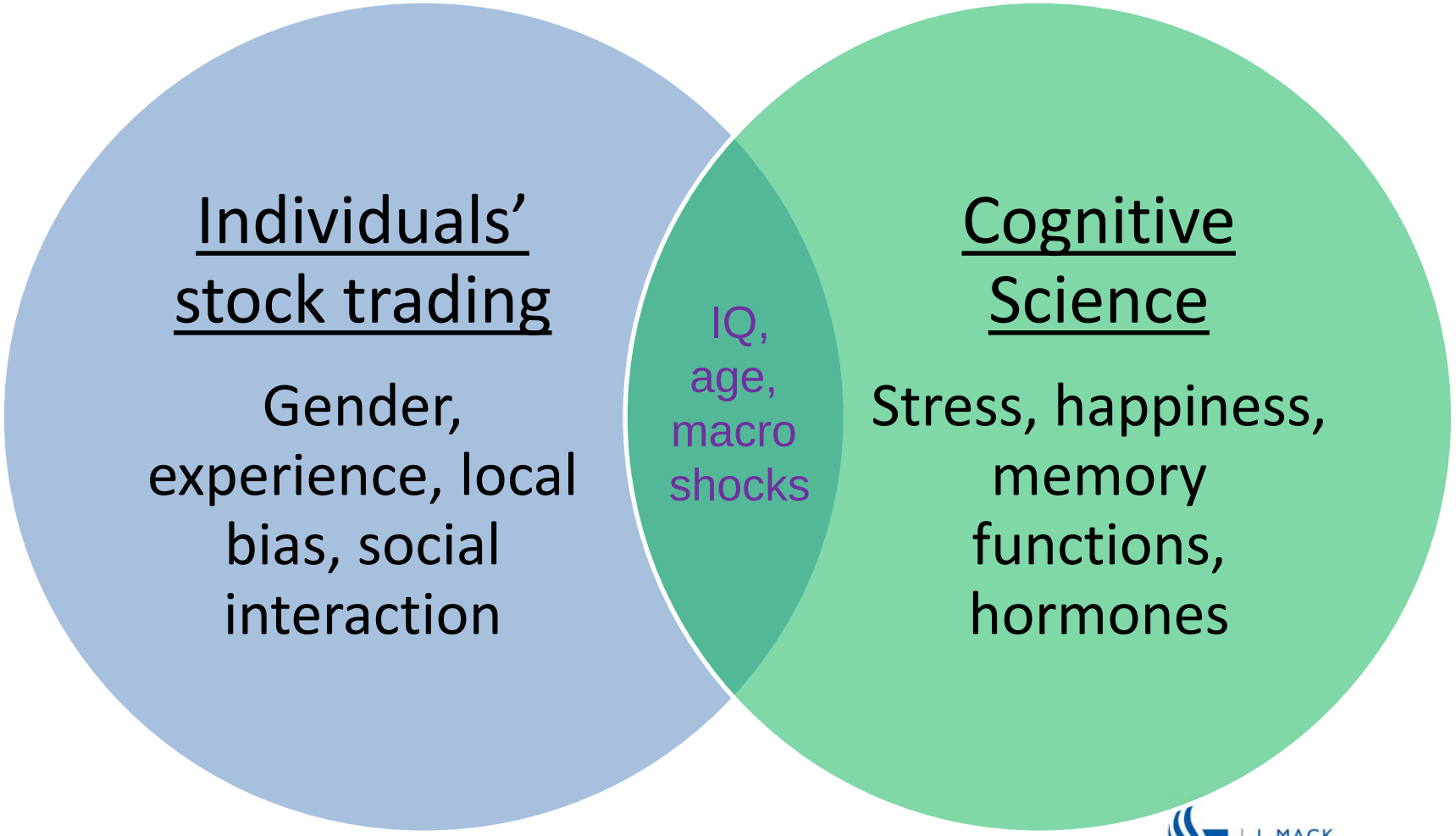
Motivation

- Individuals and households are key players in the stock market
- Factors influencing individuals' stock trading:
  - **Gender (Barber and Odean, 2001)**
  - **Age (Korniotis and Kumar, 2011; Betermier, Calvet and Sodini, 2017)**
  - **IQ (Grinblatt, Keloharju and Linnainmaa, 2011, 2012)**
  - **Experience (Seru, Shumway and Stoffman, 2010; Linnainmaa, 2011)**
  - **Local bias (Grinblatt and Keloharju, 2001a; Ivkovic and Weisbenner, 2005)**
  - **Social interactions (Ivkovic and Weisbenner, 2007; Kaustia and Knupfer, 2012)**
  - **Behavioral biases (Barber and Odean, 2000; Grinblatt and Keloharju, 2001b)**

Motivation

- Different forms of stress can also have affect individuals' financial decision making
  - **Workplace stress (Coates and Herbert, 2008; Cohn et al., 2015)**
  - **Depression and panic after macroeconomic shocks (Malmendier and Nagel, 2011; Guiso, Sapienza, and Zingales, 2018)**
  - **Fear and trauma after wars and violence (Voors et al., 2012; Callen et al., 2014)**
- A large literature in science documents stress affects cognitive abilities
- Important for policy implications since stress levels
  - **Vary significantly over time for a given individual**
  - **Can be managed through policy intervention**

Motivation



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Empirical challenges

- Identification:
  - **IQ and other "sticky" characteristics could be correlated with other unobservable time-invariant individual factors**
  - **Age is negatively related to cognitive ability but positively related to experience – opposite predictions on participation and performance**
  - **Macroeconomic shocks affects all individuals at the same time**
- Data:
  - **Datasets containing both measures of cognitive abilities and financial performance are hard to obtain (Korniotis and Kumar, 2010)**

Contributions

- Utilize a large scale data on investor trading and identify a significant shock to stress due to a major terror attack
- Examine the *changes* in trade behavior and performance for the *same* individual around the shock
- Sharp identification by exploiting the cross-sectional variation of exposures to attacks using investor location data

Terror attacks

- Use the 2008 Mumbai terrorist attacks (Nov 26, 2008) as a natural experiment
  - **Targeted random areas and civilians; used lethal weapons**
  - **Significant to generate fear and stress; referred to as "India's 9/11"**
  - **Yet much less adverse wealth effect compared to the 9/11 (little significant property damage other than the Taj hotel)**

Event window

- [–7, +21] trading days around the terror attack on November 26, 2008
- Choose a shorter event window for the pre-event period to avoid any confounding effect of the global financial crisis (e.g., rumors in October 2008 that ICICI, India's largest private bank, will go bankrupt due to its holdings of Lehman Brothers)
- Ends on December 30, 2008 to avoid confounding effects of the New Year Holiday
- Extending to [–21, +21] window has little impact on main results

Data

- Original data
  - **Trader-day-stock level data consisting of all trading records of 14 million traders on the Indian National Stock Exchange (NSE) between 2004 and 2017**
  - **Number of shares bought and sold, and the average prices of the buys and sales**
  - **Location for each trader, including zip code, city, and state**
- Data used in paper: all trading records during the 4 weeks around the attacks
  - **Investors that never trade during the 4 weeks will get dropped from analysis due to individual FE**

Measures of trading

- *probtrade*: equal to one if an investor makes any stock purchase or sale during the day, and zero otherwise
- *totvol*: total trading volume per trader per day in Indian Rupees (INR)
- *nstock*: number of stocks traded per trader per day
- *totshr:* total number of shares traded per trader per day
- For the last three measures, also construct **conditional measures** of trading activities: *CONDvol*, *CONDnum*, and *CONDshr*

Measures of trading: Summary stats

Variable	Obs	Mean	STD	25%	Median	75%
probtrade	53,422,200	0.22	0.41	0.00	0.00	0.00
totvol	53,422,200	31.45	187.94	0.00	0.00	0.00
nstock	53,422,200	0.91	2.68	0.00	0.00	0.00
totshr	53,422,200	140.14	588.75	0.00	0.00	0.00
CONDvol	11,331,241	139.63	362.21	8.22	27.62	101.81
CONDnum	11,331,241	4.11	4.28	1.00	2.00	5.00
CONDshr	11,331,241	877.38	1923.95	55.00	200.00	760.00

- Daily total trading per trader: mean ≈ $2,840, median ≈ $561
- Much smaller than the statistics for the U.S. individual investors
  - **Mean and median sizes of $11,205 and $4,988 per trade in Barber and Odean (2000)**
  - **Mean of $11,205 per trade in Kelley and Tetlock (2013)**

Measures of trading: Correlations

	probtrade	totvol	nstock	totshr
probtrade	1.00			
totvol	0.34	1.00		
nstock	0.64	0.49	1.00	
totshr	0.45	0.65	0.59	1.00

Positively but not perfectly correlated
Capture different dimensions of trading behavior

Empirical methodology: DID

- Use proximity to attack sites to exploit the variation in individuals' exposure to the attacks
- Investigate the differences in individuals' trading behavior for those who are more exposed to the attacks (*treatment group*) compared to those that are less exposed (*control group*) before and after the event
  - **Galea et al. (2002): 7.5% of the adults in Manhattan suffered from PTSD after 9/11, while for those near World Trade Center it's 20.0%**
  - **Sharot et al. (2007): those living close to the 9/11 exhibit activation of the amygdala when asked to recall the event**

Empirical specification: DID (contd.)

$$Trade_{i,t} = \alpha + \beta * Mumbai_i \times post_t + \omega_i + \kappa_t + \varepsilon_{i,t}$$

- Observations are at the trader-day level
- *Trade*: trading behavior measures
- *Mumbai*: indicator variable for Mumbai traders
- *post*: indicator variable for post event dates
- *Individual fixed effects* ω control for **investor IQ, age, experience, and financial sophistication** that are unlikely to change over the short window around the event
- *Date fixed effects* κ control for changes in the aggregate market conditions such as **market risk**, **return**, and **liquidity**

Baseline Results (Table 2)

Panel A: Unconditional measures of trading activity

	(1) *probtrade*	(2) *totvol*	(3) *nstock*	(4) *totshr*
Mumbai×post	–0.015***	–2.885***	–0.081***	–14.376***
	(–5.61)	(–5.37)	(–5.11)	(–5.63)
Individual FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
Observations	53,422,200	53,422,200	53,422,200	53,422,200
Adj. R^2	0.397	0.476	0.555	0.417

Panel B: Conditional measures of trading activity

	(1) *CONDvol*	(2) *CONDnum*	(3) *CONDshr*
Mumbai×post	–5.422***	–0.109***	–29.905***
	(–3.50)	(–4.31)	(–3.91)
Individual FE	Yes	Yes	Yes
Day FE	Yes	Yes	Yes
Observations	10,934,570	10,934,570	10,934,570
Adj. R^2	0.591	0.571	0.548

Parallel trend of DID

Panel C: Unconditional measures of trading activity (parallel trend)

	(1) *probtrade*	(2) *totvol*	(3) *nstock*	(4) *totshr*
Mumbai×pre	–0.004	–0.309	–0.013	–0.175
	(–1.52)	(–0.60)	(–0.97)	(–0.08)
Mumbai×post	–0.018***	–3.118***	–0.091***	–14.507***
	(–10.18)	(–6.63)	(–6.90)	(–7.40)
Individual FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
Observations	53,422,200	53,422,200	53,422,200	53,422,200
Adj. R^2	0.397	0.476	0.555	0.417

Panel D: Conditional measures of trading activity (parallel trend)

	(1) *CONDvol*	(2) *CONDnum*	(3) *CONDshr*
Mumbai×pre	0.114	–0.005	–1.119
	(0.08)	(–0.17)	(–0.09)
Mumbai×post	–5.334***	–0.113***	–30.615***
	(–3.70)	(–3.61)	(–2.37)
Individual FE	Yes	Yes	Yes
Day FE	Yes	Yes	Yes
Observations	10,934,570	10,934,570	10,934,570
Adj. R^2	0.591	0.571	0.548

Also shows that the attacks were unexpected by Mumbai traders

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Economic Magnitude

- Probability of trading during a day decreased by 1.5% for an average trader located in Mumbai => 6.8% of the sample average
  - **Total number of shares traded per day decreased by 14.4 => 10.3% of the sample average**
  - **Total INR volume per trader per day decreased by INR 2,885 (about $59) => 9.2% of the sample average**
  - **Number of stocks traded per day per trader decreased by 8.1% => 8.9% of the sample average**
- Total decline of trading volume over the 21 days after the attacks is ₹2,885×337,129×21= ₹20.4 billion (about $0.4 billion)

Are those closer to attacks affected more? (Table 3)

Panel A: Unconditional measures of trading activity

	(1) *probtrade*	(2) *totvol*	(3) *nstock*	(4) *totshr*
Dist0_50×post	–0.016***	–3.064***	–0.089***	–15.696***
	(–5.56)	(–5.40)	(–5.05)	(–5.48)
Dist50_200×post	–0.012***	–2.760***	–0.073***	–14.890***
	(–4.92)	(–3.93)	(–4.55)	(–4.63)
Dist200_500×post	–0.003	–1.426***	–0.035***	–7.672***
	(–1.47)	(–3.42)	(–3.20)	(–4.02)
Dist500_1000×post	0.000	0.523**	–0.004	1.260
	(0.04)	(2.14)	(–0.72)	(1.43)
Individual FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
Observations	53,422,200	53,422,200	53,422,200	53,422,200
Adj. R^2	0.397	0.476	0.555	0.417

Dist200_500 is significant perhaps because individuals may have friends or relatives who are Mumbai residents, and suffer indirectly via social networks.

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Are those closer to attacks affected more? (Table 3)

Panel B: Conditional measures of trading activity

	(1) *CONDvol*	(2) *CONDnum*	(3) *CONDshr*
Dist0_50×post	–5.481***	–0.116***	–31.997***
	(–3.56)	(–4.42)	(–4.00)
Dist50_200×post	–4.073*	–0.086***	–27.678**
	(–1.85)	(–3.18)	(–2.38)
Dist200_500×post	–2.089*	–0.046*	–20.759***
	(–1.71)	(–1.97)	(–3.30)
Dist500_1000×post	1.363	0.005	5.727
	(1.45)	(0.34)	(1.06)
Individual FE	Yes	Yes	Yes
Day FE	Yes	Yes	Yes
Observations	10,934,570	10,934,570	10,934,570
Adj. R^2	0.591	0.548	0.571

Robustness checks

- Tax-induced selling/trading?
  - **Fiscal year end is March 31 in India**
  - **Placebo event dates of 11/26/2007 and 11/26/2009 and find no difference in Mumbai investors' trading behavior**
- Distribution of trading measures are skewed?
  - **Results unchanged under logarithm transformation**
- Metropolitan effect?
  - **Use another 9 largest cities (ranked by population) as controls and find similar results**
- Longer pre-event window

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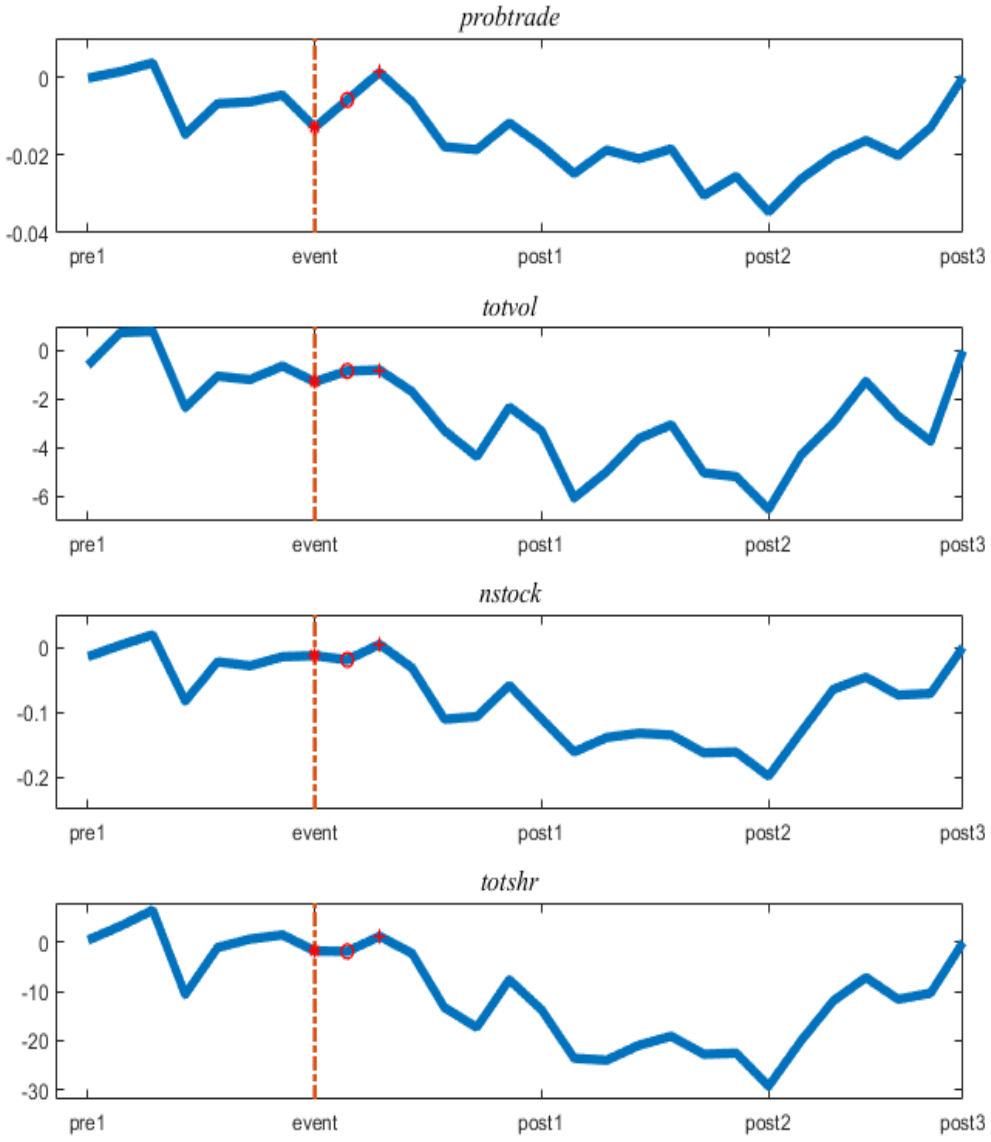
H1: Cognitive ability

- A large literature in science showing stress has implications on cognitive abilities in lab settings (Sapolsky, 1996; De Quervain, Roozendaal, and McGaugh, 1998; McEwen, 1998; Liston et al., 2009)
- Faced with danger/stress, human body releases stress hormones which interestingly, may have *dual roles*:
  - **Either can promote body reactions and prepare us to fight or flight**
  - **Or can impair memory functions, information acquisition, and cognitive abilities**

Immediate or delayed reaction?

- Kandasamy et al. (PNAS 2014) conduct a lab experiment by artificially raising the test subjects' cortisol levels to analyze their risk-taking behavior
  - **No difference between the treated and control after an acute elevation of cortisol during the <u>following day</u>**
  - **Treated became much more likely to weight small probability events during the <u>seventh day</u> of the test after prolonged exposure**
  - **<u>Accumulation</u> of stress hormone matters**

Dynamic effects of treatment



Reversal takes 3 trading weeks (4 calendar weeks)

Less than 9/11 where most recover from initial symptoms 5 to 8 weeks after the attacks (Galea et al., 2002)

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H1: Cognitive ability

- Conduct further analysis on trade performance to examine the cognitive ability
  - **Investors should have great incentive to make the best use of their cognitive ability since trading involves their own financial stake**
  - **In contrast,**
    - Risk preference hypothesis does not predict better/worse performance since risk-adjusted performance already nets out the risk component
    - Local bias hypothesis predicts better performance if Mumbai investors have informational advantage on local stocks

Trade performance measure

- Measure performance using holding period returns (in percentage) adjusted by DGTW benchmark returns following Puckett and Yan (2011)
- For each trader, in contrast to PY (2011), we compute:
  - **Performance for all trades placed before event date;**
  - **Performance for all trades placed after event date**

Trade performance measure (contd.)

- Trades before the event date:
  - **Buys (B1): holding period return for each buy trade, minus DGTW benchmark return, then weighted by the trading amount**
  - **Sells (S1): holding period return for each sell trade, minus DGTW benchmark return, then weighted by the trading amount**
- Total performance before the event date:

$$\frac{B1\times\$totalbuy\_pre+S1\times\$totalsell\_pre}{\$totalbuy\_pre+\$totalsell\_pre}$$

Trade performance measure (contd.)

- Trades after the event date:
  - **Buys (B2): holding period return for each buy trade, minus DGTW benchmark return, then weighted by the trading amount**
  - **Sells (S2): holding period return for each sell trade, minus DGTW benchmark return, then weighted by the trading amount**
- Total performance before the event date:

$$\frac{B2\times\$totalbuy\_post+S2\times\$totalsell\_post}{\$totalbuy\_post+\$totalsell\_post}$$

Trade performance (Table 4)

$$Performance_{i,T} = \alpha + \beta \times post \times Mumbai_i + \omega_i + \kappa_t + \varepsilon_{i,t}$$

where *T*=*Before* or *After*

	Performance
Mumbai ×*post*	–0.492***
	(–7.29)
Time FE	Yes
Individual FE	Yes
Observations	1,168,988
Adj. R^2	0.0699

49bps (9% of the STD)

Also inconsistent with a conjecture that Mumbai investors are more sophisticated or have better access to financial news

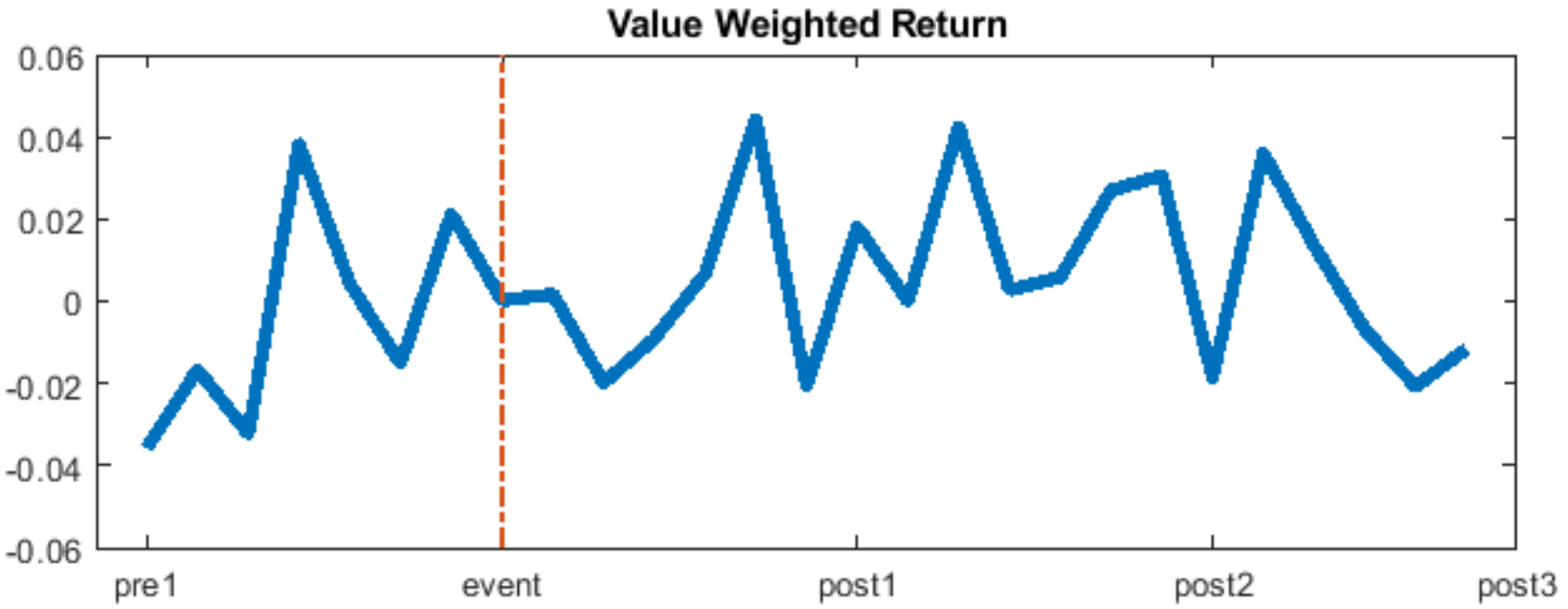
Support for the cognitive ability hypothesis

- Individuals who are more exposed to the attacks trade less after the attacks
- Delayed response to the attacks matches with the prior evidence from the lab settings
- Individuals exposed to the attacks also suffer from worse trade performance
- Alternative hypotheses?

H2: Asset fundamentals

- Terrorist attacks can have adverse implications on the economy or om the business operations of local firms
- Are the results due to shocks to investor psychology or to asset fundamentals?
  - **Day fixed effects should absorb any changes in aggregate market conditions (risk, return, liquidity)**
  - **Change in fundamentals should have similar impact for the trading behavior of Mumbai and non-Mumbai investors unless they have different information about fundamentals (discussed later in the local bias hypothesis)**

Asset fundamentals



Market returns were generally positive after the 2008 Mumbai attacks (in contrast to a 14% drop in the DJIA after the 9/11 which generated significant wealth effect)

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H3: Risk preference

- Economics literature: After exposure to violence, agents become
  - ***more* risk-averse (Callen et al., 2014; Guiso, Sapienza, and Zingales, 2018)**
  - ***less* risk-averse (Voors et al., 2012)**
- Science literature: More stress hormones can induce
  - ***more* risk-seeking behavior (Piazza et al., 1993; van den Bos et al., 2009)**
  - ***less* risk-seeking behavior (Kandasamy et al., 2014)**
- We examine purchases and sales separately since
  - **more risk aversion ⟶ sell more and buy less**
  - **less risk aversion ⟶ buy more and sell less**
  - **Short selling was extremely rare on the NSE in 2008 (Suvanam and Jalan, 2012, Kahraman and Tookes, 2016)**

Stock purchases (Table 5)

Panel A: Unconditional measures of purchase activity

	(1) *probbuy*	(2) *totvol*	(3) *nstock*	(4) *totshr*
Mumbai×post	–0.011***	–1.501***	–0.036***	–6.271***
	(–4.06)	(–5.21)	(–4.03)	(–4.52)
Individual FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
Observations	53,422,200	53,422,200	53,422,200	53,422,200
Adj. R^2	0.399	0.464	0.513	0.380

Panel B: Conditional measures of purchase activity

	(1) *CONDvol*	(2) *CONDnum*	(3) *CONDshr*
Mumbai×post	–3.625***	–0.077***	–16.257***
	(–3.98)	(–3.29)	(–3.10)
Individual FE	Yes	Yes	Yes
Day FE	Yes	Yes	Yes
Observations	10,934,570	10,934,570	10,934,570
Adj. R^2	0.574	0.536	0.524

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Stock sales (Table 5)

Panel C: Unconditional measures of sale activity

	(1) *probsell*	(2) *totvol*	(3) *nstock*	(4) *totshr*
Mumbai×post	–0.013***	–1.384***	–0.045***	–8.105***
	(–6.27)	(–5.02)	(–5.09)	(–5.83)
Individual FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
Observations	53,422,200	53,422,200	53,422,200	53,422,200
Adj. R^2	0.422	0.465	0.526	0.387

Panel D: Conditional measures of sale activity

	(1) *CONDvol*	(2) *CONDnum*	(3) *CONDshr*
Mumbai×post	–1.727**	–0.039***	–13.331***
	(–2.11)	(–3.09)	(–3.35)
Individual FE	Yes	Yes	Yes
Day FE	Yes	Yes	Yes
Observations	10,934,570	10,934,570	10,934,570
Adj. R^2	0.581	0.565	0.521

Inconsistent with the risk preference hypothesis, which predicts *less* purchase and *more* sale if investors become more risk averse in order to reduce their risk exposures to the financial market; and vice versa

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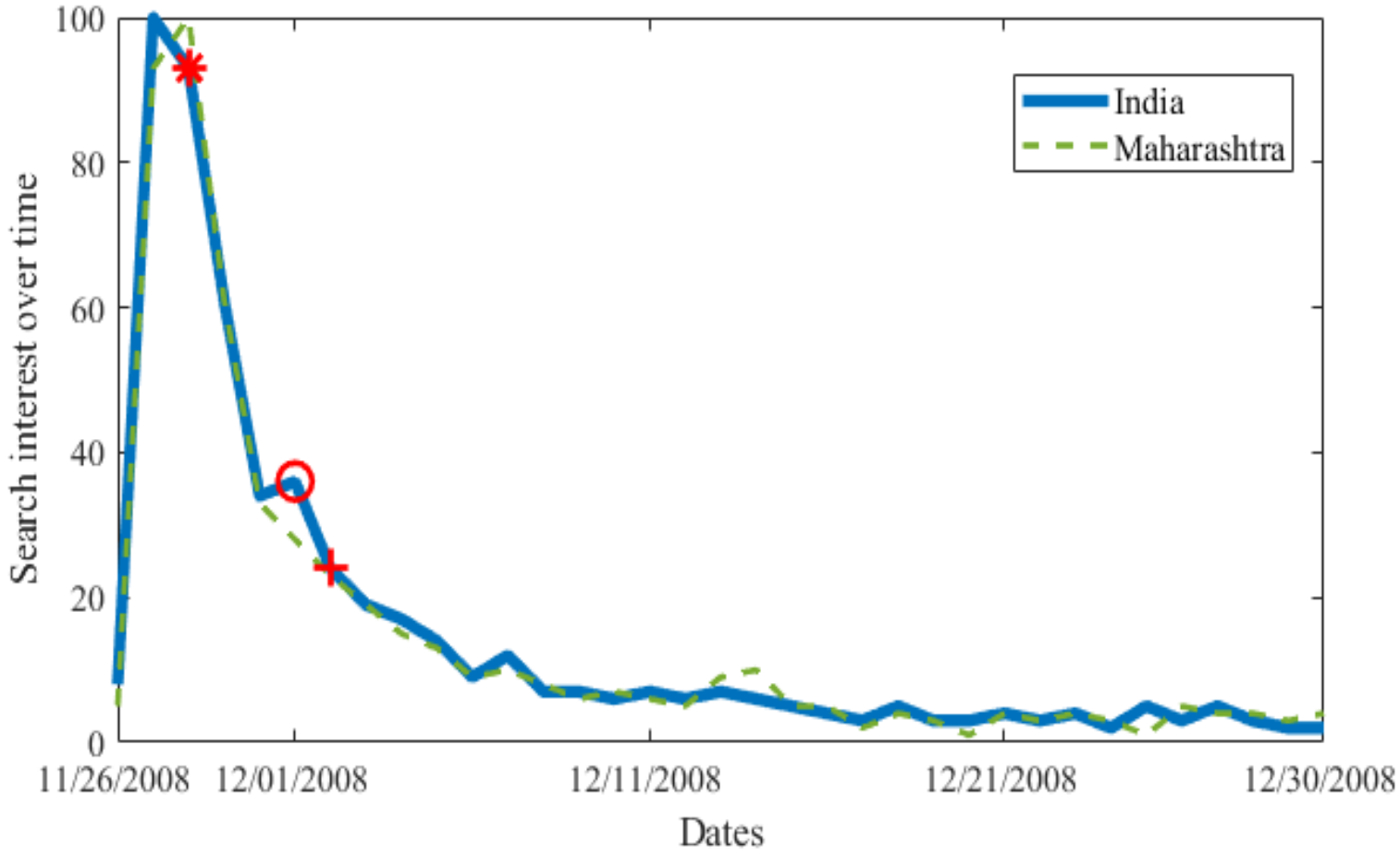
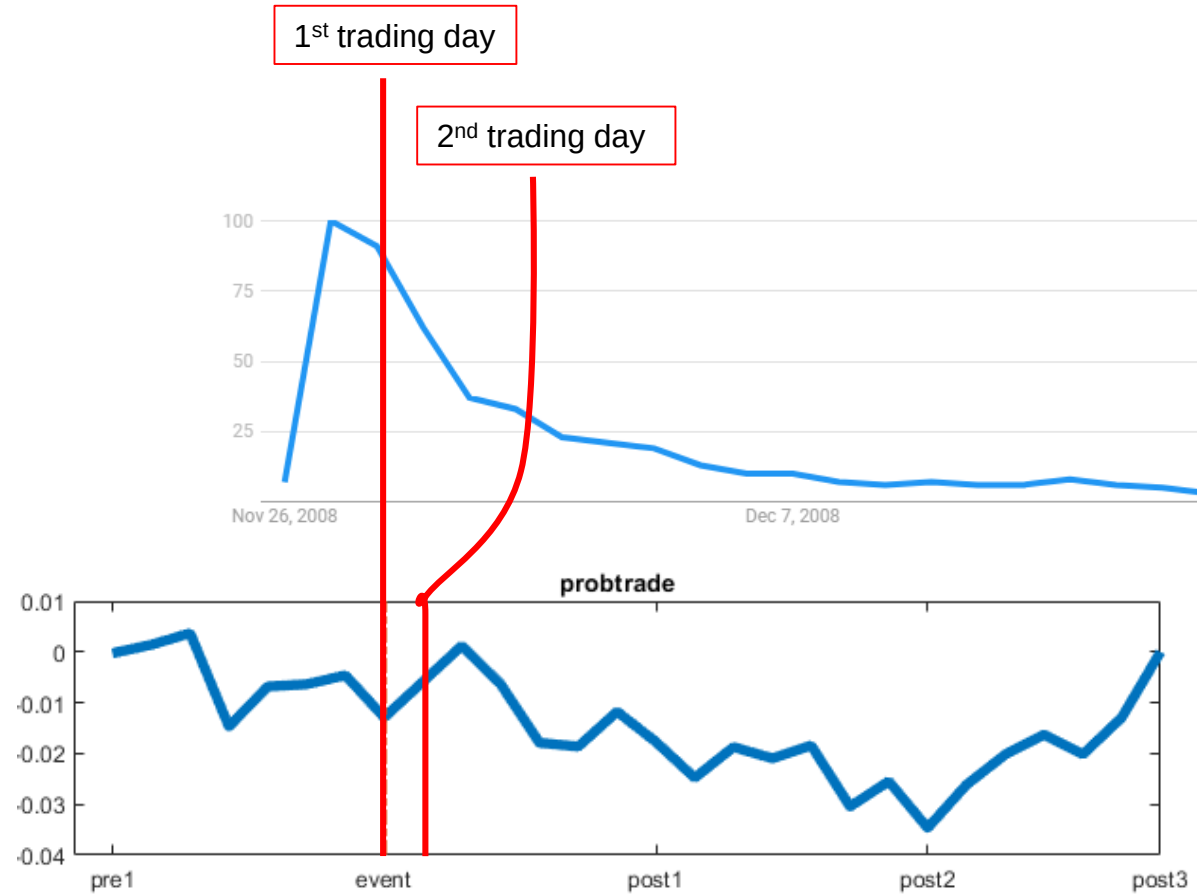
H4. Investor attention

- When investors pay attention to news on local events and get distracted, they may allocate less attention to the stocks and trade less
- Alternatively, people may be grieving or caring about families / other personal issues
- However,
  - **conditional on investors already allocating attention to and focusing on the stocks, they still trade less**
  - **the changes in trading volume is small initially, and then exhibit a U-shape pattern during the next 3 trading weeks**
  - **in sharp contrast, investors were most attentive to news during the first few days post attacks (Google trend search)**

Google search volume



Dynamic effects vs. Google search volume



Search volume: calendar days
Dynamic effects: trading days

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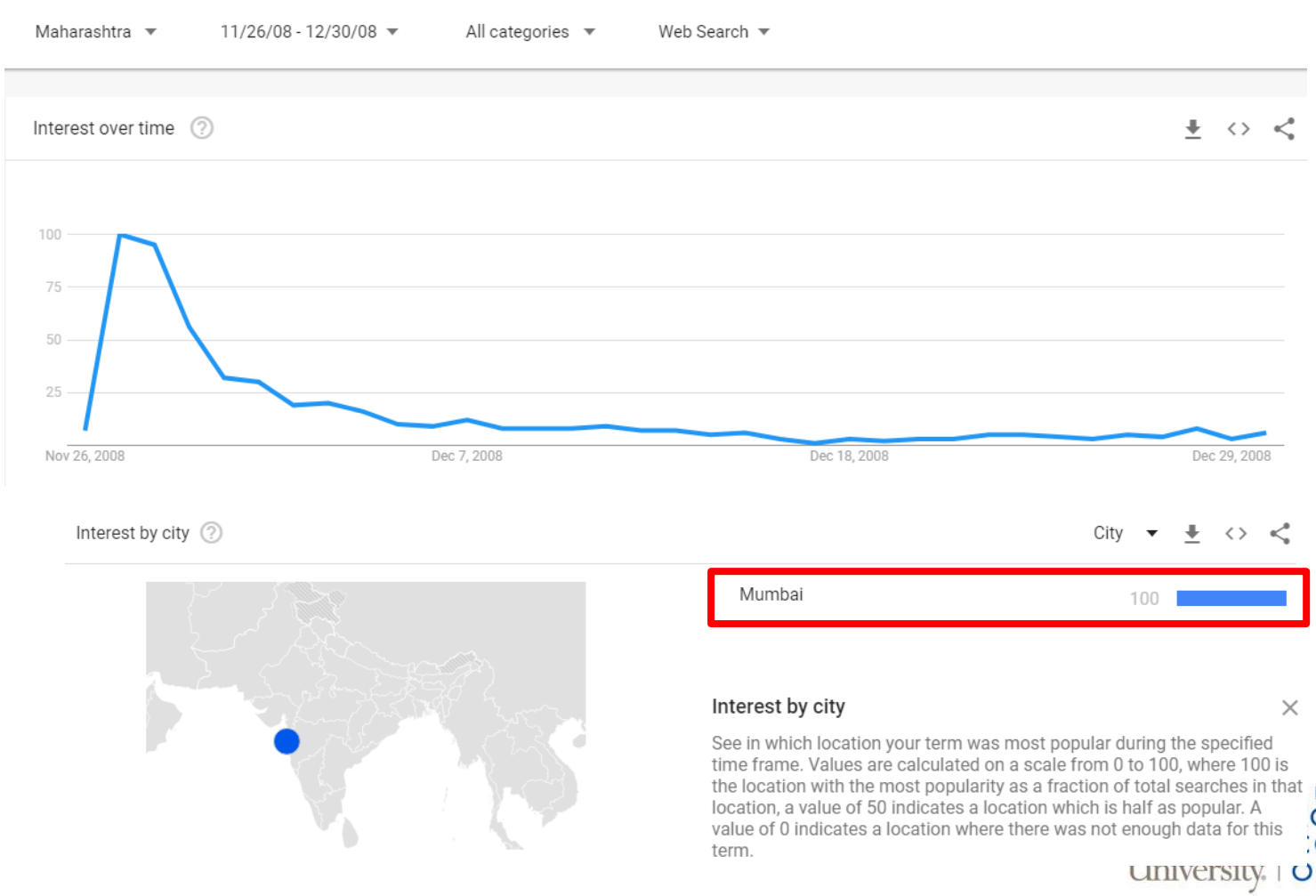
Search activities from Maharashtra are driven by those from Mumbai



Commute issues

- Individuals may have trouble travelling and spend less time on trading post attacks. However,
  - **anecdotal evidence suggests that public transportation was not much affected after the attacks**
  - **conditional on investors already trading on the stocks, they still trade less**
  - **the changes in trading is small during the first few days post attacks, when investors are most affected by commuting issues (if any)**
  - **investors far way from Mumbai were also affected**
  - **traders working in institutions should have greater need to commute (more on it later)**

H5. Local bias

- Mumbai-based investors may trade differently (strategically) if they have better information on their local stocks
- However,
  - **it does not explain symmetric trading behavior regarding purchases and sales (i.e., Mumbai-based investors should buy more and sell less if they view their local stocks as undervalued, and vice versa)**
  - **inconsistent with 2 more tests on local bias (next slide)**

Two tests for local bias (Table 6)

Panel A: Stock performance

	(1) *return*	(2) *return*
post×*Mumstock*	–0.005	0.043
	(–0.04)	(0.36)
Stock FE	Yes	No
Day FE	Yes	Yes
Observations	28,656	28,656
Adj. R^2	0.243	0.189

Mumbai firms do not perform differently from non-Mumbai firms after the attacks

Panel B: Propensity to trade Mumbai stocks

	tradeMum
Mumbai×*post*	–0.001
	(–0.89)
Individual FE	Yes
Day FE	Yes
Observations	9,632,890
Adj. R^2	0.368

Mumbai-based traders are not more likely to trade Mumbai firms after the attacks

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Summary of results

- Our results so far support the cognitive ability hypothesis, but inconsistent with the alternative hypotheses on:
  - **Asset fundamentals**
  - **Risk preference**
  - **Investor attention/commute issues**
  - **Local bias**
- Can trading experience mitigate the effect of terror?

Trader experience

- Trading experience and learning can mitigate the behavioral biases (Dhar and Zhu, 2006; Seru, Shumway, and Stoffman, 2010; Linnainmaa, 2011)
- Proxies of trader experience: past volume, past shares, account registration date, first trading date (all ranked among the top quartile)
- Also measure past experience of terror attacks (Mumbai 2006; untabulated)

Trader experience (Table 7)

Panel A: Experience based on past volume

	(1) *probtrade*	(2) *totvol*	(3) *nstock*	(4) *totshr*	(5) *CONDvol*	(6) *CONDnum*	(7) *CONDshr*
exp×*Mumbai*×*post*	0.009**	–2.109	–5.495	–0.027	–1.715	2.458	0.046
	(2.47)	(–0.81)	(–0.80)	(–0.94)	(–0.34)	(0.11)	(1.05)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	53,422,200	53,422,200	53,422,200	53,422,200	10,934,570	10,934,570	10,934,570
Adj. R^2	0.377	0.458	0.397	0.539	0.542	0.495	0.520

Panel B: Experience based on past shares

	(1) *probtrade*	(2) *totvol*	(3) *nstock*	(4) *totshr*	(5) *CONDvol*	(6) *CONDnum*	(7) *CONDshr*
exp×*Mumbai*×*post*	0.010***	–2.176	–7.685	–0.026	–3.777	–7.894	0.025
	(3.01)	(–0.90)	(–1.08)	(–0.90)	(–0.78)	(–0.34)	(0.61)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	53,422,200	53,422,200	53,422,200	53,422,200	10,934,570	10,934,570	10,934,570
Adj. R^2	0.377	0.458	0.397	0.540	0.542	0.495	0.520

Experience helps alleviate only the decline in the probability of trading but not decline in other measures of trading activity

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Trader experience (contd.)

Panel C: Experience based on the account registration date

	(1) *probtrade*	(2) *totvol*	(3) *nstock*	(4) *totshr*	(5) *CONDvol*	(6) *CONDnum*	(7) *CONDshr*
exp×*Mumbai*×*post*	0.003**	–0.602	–0.947	0.008	–1.906	3.123	0.020
	(2.55)	(–1.02)	(–0.56)	(1.16)	(–0.69)	(0.19)	(0.71)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	53,422,200	53,422,200	53,422,200	53,422,200	10,934,570	10,934,570	10,934,570
Adj. R^2	0.377	0.458	0.397	0.539	0.542	0.495	0.520

Panel D: Experience based on the first trading date

	(1) *probtrade*	(2) *totvol*	(3) *nstock*	(4) *totshr*	(5) *CONDvol*	(6) *CONDnum*	(7) *CONDshr*
exp×*Mumbai*×*post*	0.004**	–0.309	0.068	0.001	–2.165	0.287	–0.011
	(2.58)	(–0.46)	(0.04)	(0.19)	(–0.82)	(0.02)	(–0.36)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	53,422,200	53,422,200	53,422,200	53,422,200	10,934,570	10,934,570	10,934,570
Adj. R^2	0.377	0.458	0.397	0.539	0.542	0.495	0.520

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Institutional investors

- All the prior results are based on the trading behavior of individual investors
- Expect less impact on institutional investors since:
  - **Institutions can use algorithmic trading, requiring less human intervention**
  - **Institutions can counsel their traders on how to manage fear**

Institutional investors (Table 8)

Unconditional measures of trading activity

	(1) *probtrade*	(2) *totvol*	(3) *nstock*	(4) *totshr*
Mumbai×post	0.008	–46.700	0.042	58.289
	(1.53)	(–0.56)	(1.24)	(0.20)
Individual FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
Observations	1,416,390	1,416,390	1,416,390	1,416,390
Adj. R^2	0.371	0.720	0.841	0.725

Conditional measures of trading activity

	(1) *CONDvol*	(2) *CONDnum*	(3) *CONDshr*
Mumbai×post	6.647	0.163	845.425
	(0.01)	(0.84)	(0.53)
Individual FE	Yes	Yes	Yes
Day FE	Yes	Yes	Yes
Observations	251,207	251,207	251,207
Adj. R^2	0.790	0.873	0.793

Conclusions

- Overall evidence consistent with individuals suffering from loss of cognitive ability
  - **Mumbai traders traded less after the attacks, and suffer from worse trade performance compared to non-Mumbai traders**
- Contributes to the literature on
  - **Cognitive factors influencing household stock market investment**
  - **Violence and trauma affecting financial decision making**
- Have implications for less severe forms of stress (e.g., workplace stress) that can cause similar physiologic responses of human bodies (McEwen, 1998; Coates and Herbert, 2008)