

Front Page News: The Effect of News Positioning on Financial Markets

Anastassia Fedyk
Harvard Business School

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Information in Financial Markets

“A huge amount of time and effort is devoted by public companies to managing the divide between public and private potentially market-moving information. I can envision a future in which we abandon concepts like 10-Qs and 8-Ks in favor of a continuous stream of relevant performance data.”
- *Tom Glocer, former CEO of Reuters Group PLC*

Information in Financial Markets

- How much impact does **presentation** of information have?
 - ① To what extent does the market react differently to identical content positioned more / less prominently?
 - ② Compare the effect of **positioning** against the effect of **importance**

Information in Financial Markets

- How much impact does presentation of information have?
 - 1 To what extent does the market react differently to identical content positioned more / less prominently?
 - 2 Compare the effect of positioning against the effect of importance
- [This paper](#): exploit a natural experiment in news positioning on the Bloomberg terminal
 - ▶ Most important news always prominently positioned
 - ▶ Middling importance: depends on space availability

Preview of Findings

- ① Positioning has a large effect
 - ▶ First 10 min: 280% larger trading volume, 180% larger price change
 - ▶ 21% more drift from first five minutes to next five minutes

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- ② Consistent with gradual information diffusion models
 - ▶ News articles stay prominently positioned for up to a couple hours, sometimes minutes
 - ▶ Prominent position → price drift for up to 45 minutes, partial reversal over 1-2 hours

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- ③ Diff in position has a larger effect than diff in news importance

Overview

- ① Data: natural experiment in news positioning
- ② Comparison of articles in absence of diff position
 - ▶ Textual analysis using topic modeling
 - ▶ Survey of active finance professionals
- ③ Conceptual framework
- ④ Causal analysis: effect of news position
- ⑤ Effect of positioning vs. effect of importance

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Data

GRAB

Search News Sources Display & Edit Custom Searches Page 1 News

Company News <Narrow This Search> Sort Time Ordered

Translate to..

1) Dollar Rises to 13-Year High as U.S. Stocks Rebound, Gold Sinks	BN	14:49
2) Mexico Raises Rate More Than Expected as Peso Lags at Record (1)	BN	14:47
3) Ralph Lauren Tumbles After Analyst Predicts Slow Turnaround	BN	14:38
52) Channel NewsAsia: White House points to Putin over election hack	NS6	15:01
51) Prensa Latina: Proceedings to Expropriate House where Hitler was Born Begin	NS7	15:01
50) Arch Daily: West Campus Union / Grimshaw	BLG	15:01
49) androidcentral: Get a free 5-pack of Micro-USB cables with this Quick Charge 3.0...	BLG	15:01
48) JewishNewsWeekly: Tillerson's policies could clash with Jewish agenda	NS1	15:01
47) Oil & Gas People: Stone Energy Files for Bankruptcy to Carry Out Debt Cutting Plan	NS3	15:01
46) CNBC Wires: Feds end airline price-gouging probe without finding fault	NS1	15:01
45) WTHI: Time running out to sign up for Obama Care	NS1	15:01
44) Marine Link: New Research to Examine Oil Spill Impacts	NS1	15:01
43) Saipan Tribune: Ready to be President?	NS6	15:01
42) EnvrmLawProf: ELC Essay #10: Questioning the Value of Solar	BLG	15:01
41) Saipan Tribune: Two essential books for Mandarin	NS6	15:01
40) Saipan Tribune: The poker syndrome	NS6	15:01
39) Macau Business: Taiwan to ease visa entry for SARs residents travelling via cruises	NS6	15:01
38) Macau Business: Macau could have role in next Batman movie	NS6	15:01
37) Pymnts.com: Unicorns Eye Public Markets, Leave IPOs Behind	NS1	15:01
36) USDA ESMIS: Turkey Hatchery	G01	15:01

Australia 61 2 9777 8600 Brazil 55 11 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2016 Bloomberg Finance L.P.
 SN 271896 G564-1282-2 15-Dec-16 15:01:36 EST GMT-5:0

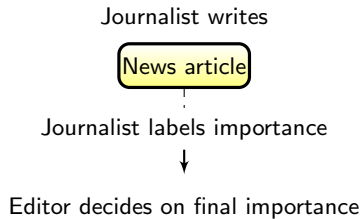
Data

Positioning Process



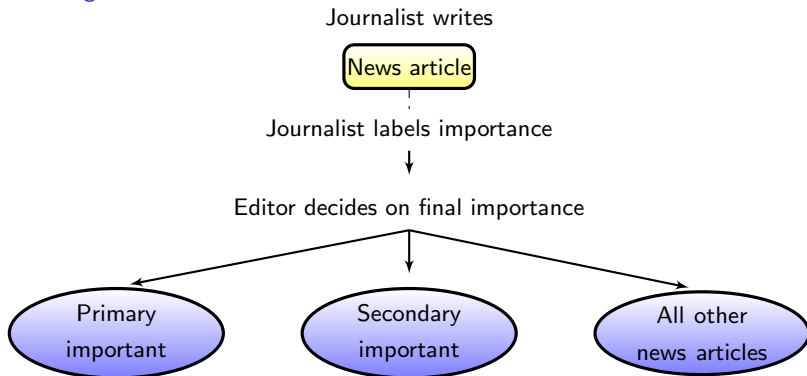
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Positioning Process



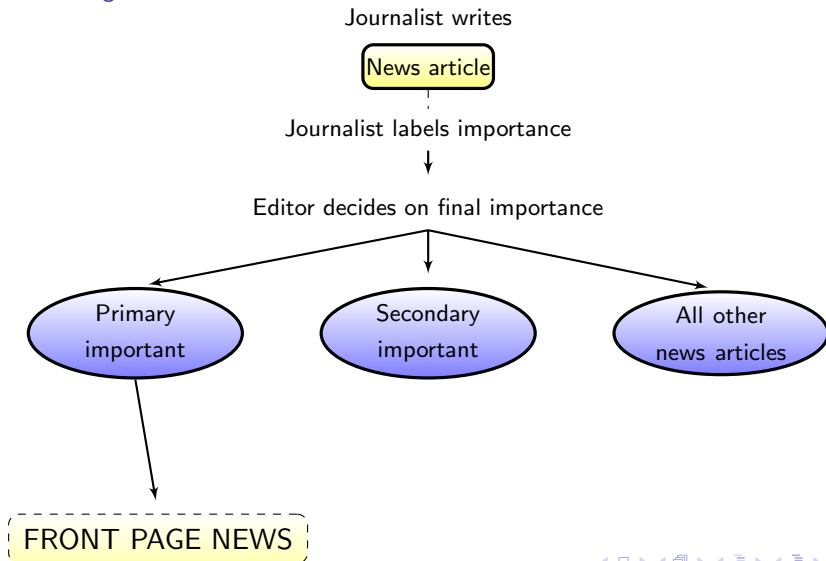
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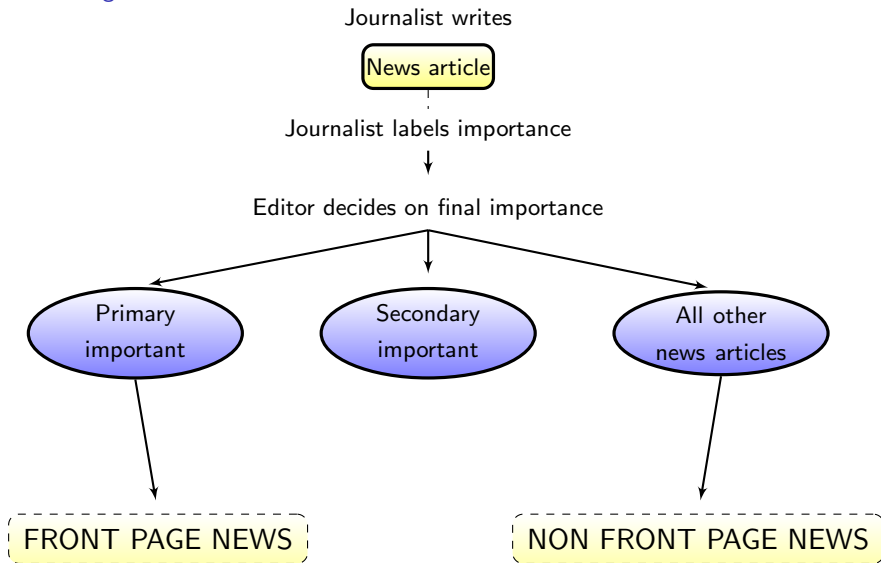
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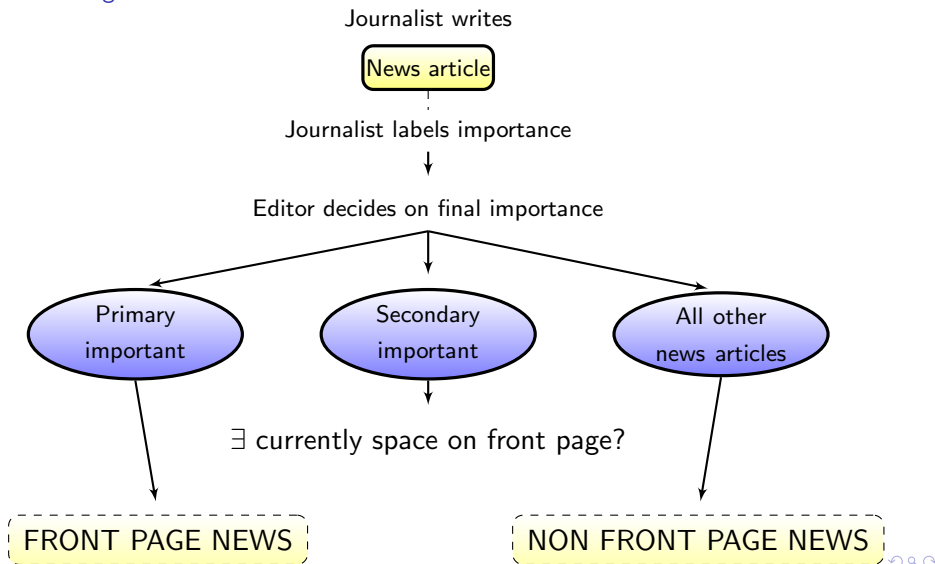
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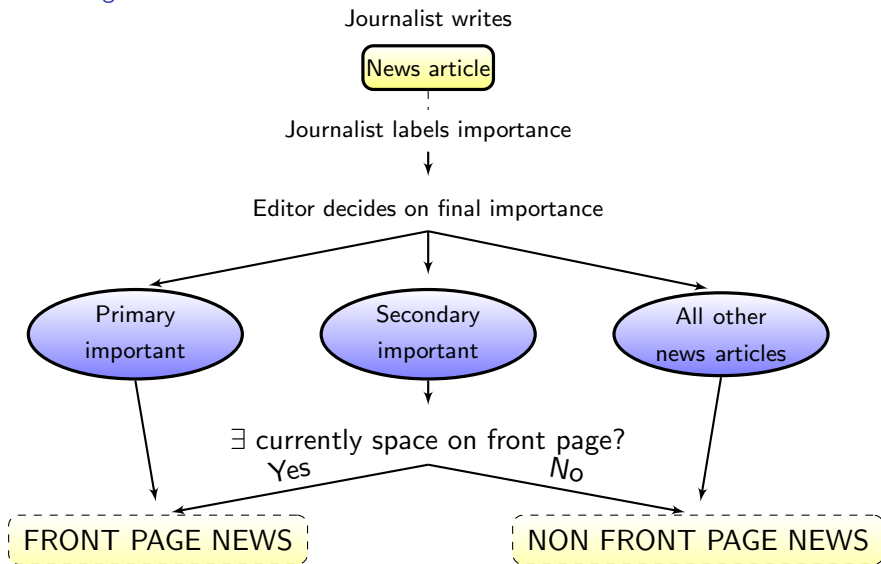
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Positioning Process



Data

Positioning Process



Data

- **News positioning & importance:** manually collected articles
 - ▶ March 22, 2014 - August 31, 2015
 - ▶ News during 8AM-5PM EST, tagged with U.S. securities
 - ▶ 2,046 primary important article-tickers
 - ▶ 6,626 secondary important article-tickers, 994 on front page

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- Market data: QuantQuote
 - ▶ Includes quotes from NYSE and NASDAQ
 - ▶ Cleaned, preprocessed, second-level prices and trades
 - ▶ Merged: 1,156 PI, 735 front page SI, 3,819 non-front page SI

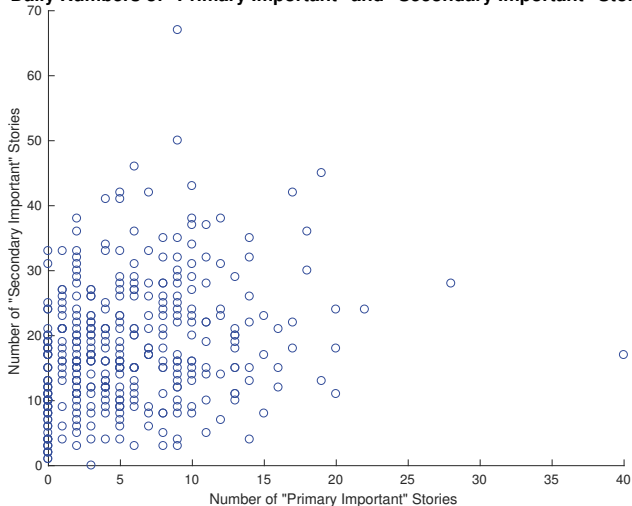
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 - ▶ Merged: 1,156 PI, 735 front page SI, 3,819 non-front page SI
- Additional data sources
 - ▶ Large corpus of financial news from Reuters for textual analysis
 - ▶ Survey of active financial professionals

Data

News Positioning & Importance

Daily Numbers of "Primary Important" and "Secondary Important" Stories



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Comparison of Articles

Textual Analysis

- **Goal:** verify that there are no systematic differences in textual content of front page and non-front page news
 - ▶ What about primary important vs. secondary important news?

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- **Method:** Latent Dirichlet Allocation

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 - ① Learn topics generally discussed in financial news from large (1.8M articles) corpus from Reuters (TRC2)

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- Goal: verify that there are no systematic differences in textual content of front page and non-front page news
 - ▶ What about primary important vs. secondary important news?
- Approach: model and compare topics discussed in the different categories of news
- **Method:** Latent Dirichlet Allocation
 - 1 Learn topics generally discussed in financial news from large (1.8M articles) corpus from Reuters (TRC2)
 - 2 Use trained model to compare distributions of topics in front page secondary important, non-front page secondary important, and primary important news

Comparison of Articles

Identified Topics

- **Technology:** data, technology, companies, security, information, ...

Comparison of Articles

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- **Earnings & Performance:** percent, year, sales, quarter, million, ...

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- **Litigation:** court, case, judge, federal, workers, ...

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- **Technology:** data, technology, companies, security, information, ...
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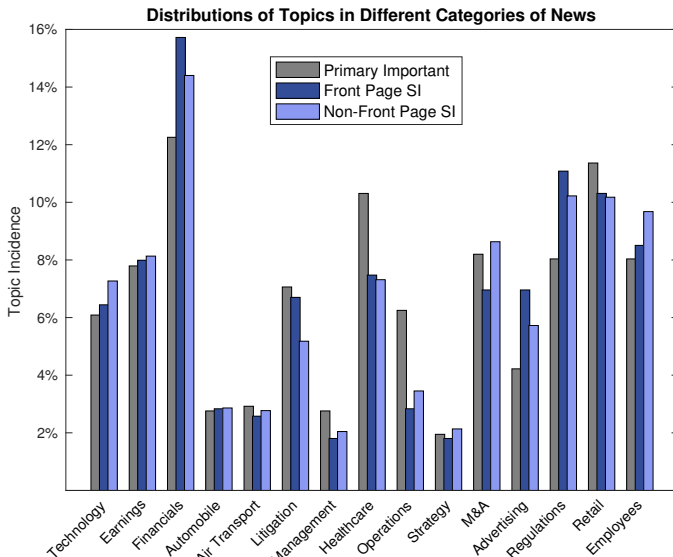
Comparison of Articles

Identified Topics

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- **Mergers & Acquisitions:** deal, offer, price, people, bid, ...

Comparison of Articles

Topic Distributions



Comparison of Articles

Topic Distributions

- Pairwise χ -square tests of independence

Comparison of Articles

Topic Distributions

- Pairwise χ -square tests of independence

Panel 1: Front Page SI versus Non-Front Page SI

# Topics in Model	p-value
10 topics	0.8670
15 topics	0.8776
20 topics	0.8731
25 topics	0.7801

Comparison of Articles

Topic Distributions

- Pairwise χ -square tests of independence

Panel 1: Front Page SI versus Non-Front Page SI

# Topics in Model	p-value
10 topics	0.8670
15 topics	0.8776
20 topics	0.8731
25 topics	0.7801

Panel 2: PI versus Front Page SI

# Topics in Model	p-value
10 topics	0.1236
15 topics	0.0836†
20 topics	0.0526†
25 topics	0.0417*

Comparison of Articles

Survey of Active Finance Professionals

- **Goal:** absent differential positioning, can market participants tell apart front page & non-front page news?
 - ▶ What about primary important vs. secondary important news?

Comparison of Articles

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- Approach: survey the target audience – active finance professionals and MBA students

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- Goal: absent differential positioning, can market participants tell apart front page & non-front page news?
 - ▶ What about primary important vs. secondary important news?
- Approach: survey the target audience – active finance professionals and MBA students
- Questions: 25 questions per respondent
 - 1 Front page secondary important vs. non-front page SI
 - 2 Primary important vs. non-front page secondary important

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- Approach: survey the target audience – active finance professionals and MBA students
- Questions: 25 questions per respondent
 - 1 Front page secondary important vs. non-front page SI
 - 2 Primary important vs. non-front page secondary important
- **Participants:** 150 professionals, 26 MBA students
 - ▶ **Decision makers:** managing directors, principals, partners, chairmen

Comparison of Articles

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- **Banks & Broker Dealers:** Goldman Sachs, Morgan Stanley, JP Morgan, Bank of America, HSBC, BNP Paribas, UBS, ...

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- **Private Equity:** Blackstone, Warburg Pincus, Motive Partners, ...
- **Investment Banks:** Barclays Capital, Lazard
- **MBA students:** HBS, Wharton, Columbia, Chicago, Georgetown, UVA

Comparison of Articles

Survey of Active Finance Professionals

Which Financial News Headline Is More Important?

(Question 4) For the news headlines below, please select the radio button next to the headline that you think had **larger market impact** and is **more deserving of prominence**.

☐ **ALLSTATE THIRD-QUARTER
PROFIT MORE THAN DOUBLES
ON PREMIUM GAINS**

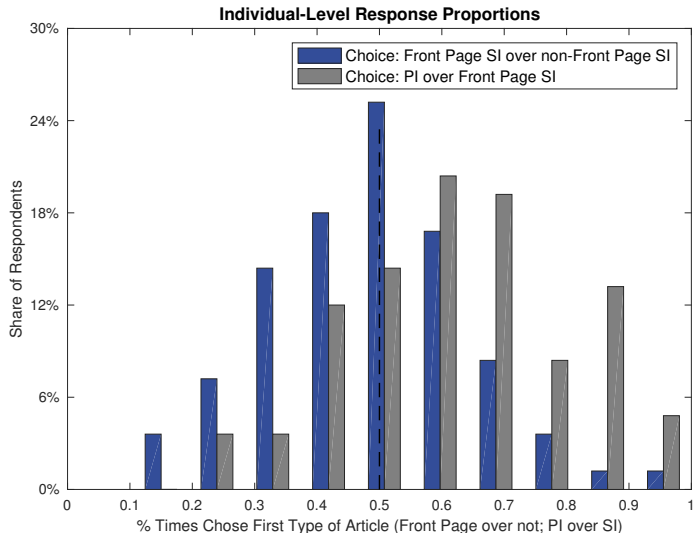
☐ **EINHORN SAYS BULLISH ON
TECHNOLOGY, SEEKS TO
CLARIFY BUBBLE CALL**

EXIT

NEXT

Comparison of Articles

Survey of Active Finance Professionals



Comparison of Articles

Survey of Active Finance Professionals

PI versus Front Page SI

Respondent Type	Choosing PI	SE	# Respondents
Finance Professionals	61.16%**	(2.13%)	150
MBA Students	57.54%*	(3.55%)	26
All Respondents	60.58%**	(1.87%)	176

Comparison of Articles

Survey of Active Finance Professionals

PI versus Front Page SI

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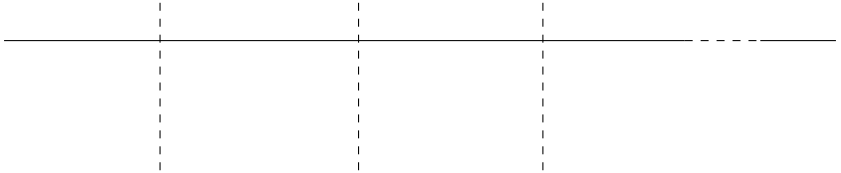
Front Page SI versus Non-Front Page SI

Respondent Type	Choosing Front Page	SE	# Respondents
Finance Professionals	48.24%	(1.21%)	150
MBA students	45.05%†	(2.65%)	26
All Respondents	47.78%*	(1.11%)	176

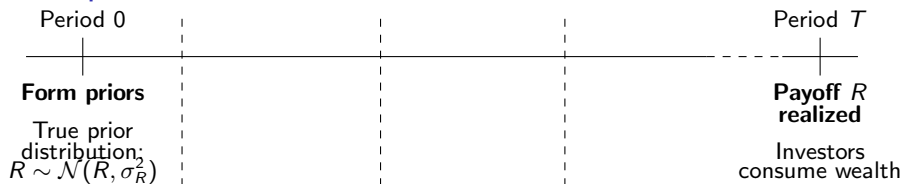
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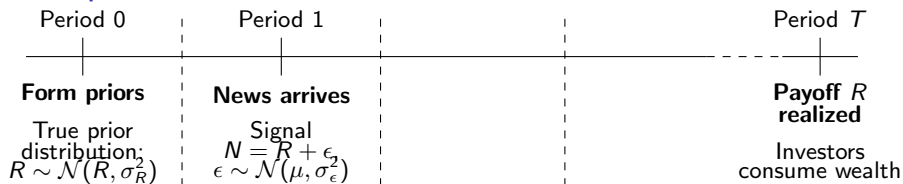
Conceptual Framework



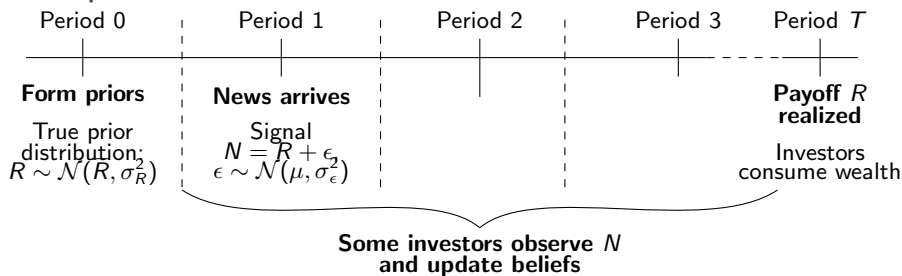
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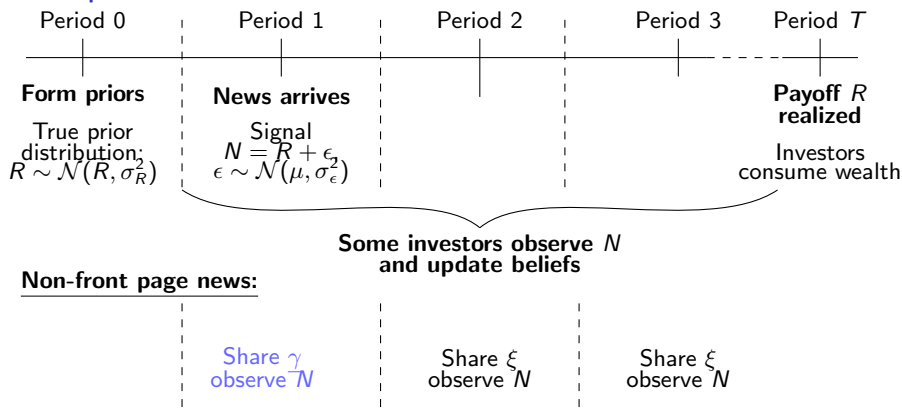
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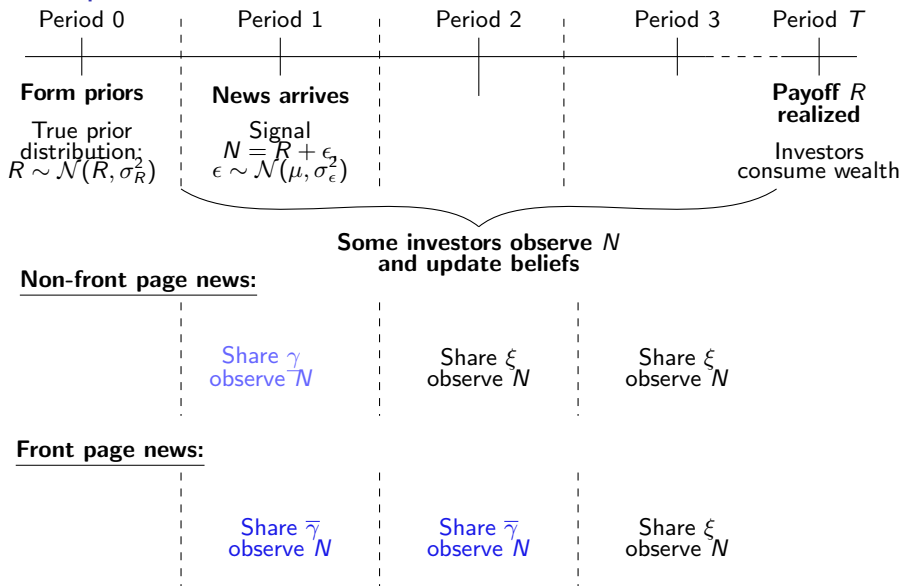
Conceptual Framework



Conceptual Framework



Conceptual Framework



Conceptual Framework

Predictions

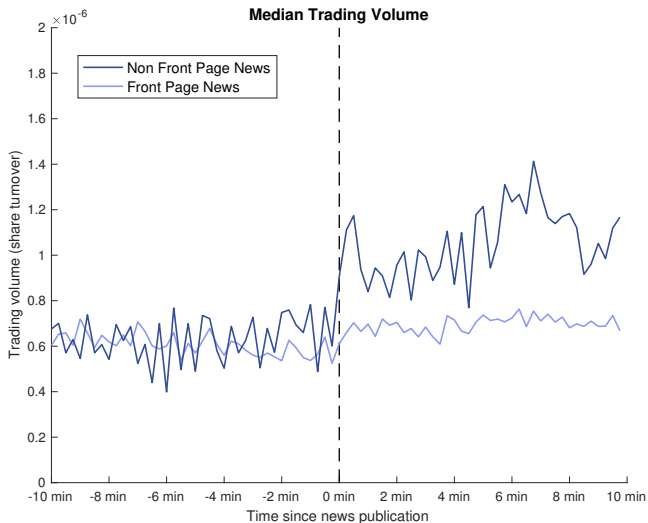
- 1 *Higher immediate trading volume and absolute price change after front page news.*
- 2 *More short-term drift after front page news.*
- 3 *Less longer-term drift after front page news.*

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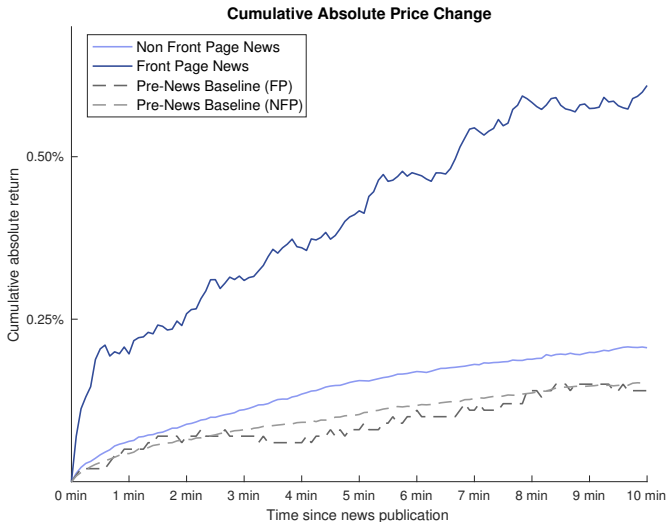
Illustrative Results

Trading Volumes



Illustrative Results

Absolute Price Change



Empirical Results

Immediate Trading Volume

- Compare total trading volumes within 5 min, 10 min, 1 hour after front page and non-front page news

Empirical Results

Immediate Trading Volume

- Compare total trading volumes within 5 min, 10 min, 1 hour after front page and non-front page news

	Front Page SI News	Non-Front Page SI News	Difference
First 5 min	0.10%	0.02%	0.07%**
Standard Error	(0.00012)	(0.00001)	(0.00013)
# Observations	678	3,476	–
First 10 min	0.19%	0.05%	0.14%**
Standard Error	(0.00030)	(0.00002)	(0.00031)
# Observations	689	3,547	–
First 1 hour	0.58%	0.26%	0.32%**
Standard Error	(0.00143)	(0.00012)	(0.00143)
# Observations	721	3,726	–

Empirical Results

Immediate Absolute Price Change

- Compare absolute price changes within 5 min, 10 min, 1 hour after front page and non-front page news

Empirical Results

Immediate Absolute Price Change

- Compare absolute price changes within 5 min, 10 min, 1 hour after front page and non-front page news

	Front Page SI News	Non-Front Page SI News	Difference
First 5 min	0.42%	0.16%	0.26%**
Standard Error	(0.00041)	(0.00006)	(0.00042)
# Observations	678	3,476	–
First 10 min	0.60%	0.21%	0.39%**
Standard Error	(0.00065)	(0.00006)	(0.00066)
# Observations	689	3,547	–
First 1 hour	0.98%	0.51%	0.47%**
Standard Error	(0.00145)	(0.00027)	(0.00147)
# Observations	721	3,726	–

Empirical Results

Short-Term Price Drift

- To compare drift after front page and non-front page articles:

$$Ret_{s,i,[t+t_1,t+t_2]} = \alpha + \beta_1 Ret_{s,i,[t,t+t_1]} + \beta_2 FP_s \\ + \beta_3 Ret_{s,i,[t,t+t_1]} \times FP_s + \gamma X_{i,t} + \epsilon_{s,i,t}$$

- ▶ FP_s = indicator equal to 1 if article s is on the front page
- ▶ Coefficient of interest: β_3

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- ▶ Coefficient of interest: β_3
- ▶ Immediate window: $t_1 \in \{5 \text{ min}, 10 \text{ min}\}$
- ▶ Delayed window: $t_2 \in \{10 \text{ min}, 15 \text{ min}, 30 \text{ min}, 45 \text{ min}\}$

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- Controls:

- 1 None
- 2 Month and hour fixed effects
- 3 Month & hour FE, industry FE, log market cap

Empirical Results

Short-Term Price Drift

$t_1 = 5 \text{ min}, t_2 = 10 \text{ min}$			$t_1 = 5 \text{ min}, t_2 = 15 \text{ min}$		
(1)	(2)	(3)	(1)	(2)	(3)
0.307**	0.306**	0.316**	0.259**	0.257**	0.250**
(0.034)	(0.035)	(0.035)	(0.034)	(0.034)	(0.034)
# Obs: FP SI, Non-FP SI:					
689	689	688	699	699	698
3,547	3,547	3,546	3,577	3,577	3,575

$t_1 = 10 \text{ min}, t_2 = 30 \text{ min}$			$t_1 = 10 \text{ min}, t_2 = 45 \text{ min}$		
(1)	(2)	(3)	(1)	(2)	(3)
0.220**	0.219**	0.228**	0.347**	0.356**	0.363**
(0.039)	(0.040)	(0.040)	(0.053)	(0.053)	(0.053)
# Obs: FP SI, Non-FP SI:					
710	710	710	718	718	718
3,653	3,653	3,651	3,691	3,691	3,689

Empirical Results

Longer-Term Price Drift

- To compare drift after front page and non-front page articles:

$$\begin{aligned} Ret_{s,i,[t+t_1,t+t_2]} = & \alpha + \beta_1 Ret_{s,i,[t,t+t_1]} + \beta_2 FP_s \\ & + \beta_3 Ret_{s,i,[t,t+t_1]} \times FP_s \gamma X_{i,t} + \epsilon_{s,i,t} \end{aligned}$$

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Empirical Results

Longer-Term Price Drift

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- ▶ FP_s = indicator equal to 1 if article s is on the front page
- ▶ Coefficient of interest: β_3
- ▶ Immediate window: $t_1 \in \{30 \text{ min}, 45 \text{ min}\}$
- ▶ Delayed window: $t_2 \in \{90 \text{ min}, 120 \text{ min}\}$

Empirical Results

Longer-Term Price Drift

- To compare drift after front page and non-front page articles:

$$\begin{aligned} Ret_{s,i,[t+t_1,t+t_2]} = & \alpha + \beta_1 Ret_{s,i,[t,t+t_1]} + \beta_2 FP_s \\ & + \beta_3 Ret_{s,i,[t,t+t_1]} \times FP_s \gamma X_{i,t} + \epsilon_{s,i,t} \end{aligned}$$

- ▶ FP_s = indicator equal to 1 if article s is on the front page
- ▶ Coefficient of interest: β_3
- ▶ Immediate window: $t_1 \in \{30 \text{ min}, 45 \text{ min}\}$
- ▶ Delayed window: $t_2 \in \{90 \text{ min}, 120 \text{ min}\}$

- Controls:

- 1 None
- 2 Month and hour fixed effects
- 3 Month & hour FE, industry FE, log market cap

Empirical Results

Longer-Term Price Drift

$t_1 = 30 \text{ min}, t_2 = 90 \text{ min}$			$t_1 = 45 \text{ min}, t_2 = 90 \text{ min}$		
(1)	(2)	(3)	(1)	(2)	(3)
-0.143**	-0.142**	-0.145**	-0.215**	-0.215**	-0.214**
(0.038)	(0.038)	(0.038)	(0.022)	(0.023)	(0.023)
# Obs: FP SI, Non-FP SI:					
725	725	724	725	725	724
3,751	3,751	3,749	3,751	3,751	3,749

$t_1 = 30 \text{ min}, t_2 = 120 \text{ min}$			$t_1 = 30 \text{ min}, t_2 = 120 \text{ min}$		
(1)	(2)	(3)	(1)	(2)	(3)
-0.178**	-0.179**	-0.181**	-0.286**	-0.303**	-0.286**
(0.039)	(0.039)	(0.040)	(0.022)	(0.022)	(0.022)
# Obs: FP SI, Non-FP SI:					
726	726	725	726	726	725
3,754	3,754	3,752	3,754	3,754	3,752

Empirical Results

Permanent Market Impact

- **Question:** does the differential market induced by news positioning reaction correct completely?

Empirical Results

Permanent Market Impact

- **Question:** does the differential market induced by news positioning reaction correct completely?
- **Approach:** look at trading volumes, price changes days later
 - ▶ Timing: $d \in \{1, \dots, 5\}$ days after news
 - ▶ Trading volume: over 10-min period d days after news
 - ▶ Absolute price changes: from publication to exactly d days after

Empirical Results

Permanent Market Impact

Number of Days after News	Difference in:	
	Trading Volume	Absolute Price Change
$d = 1$	0.02%**	0.53%**
Standard Error	(0.0001)	(0.0014)
# Obs (FP; NFP)	668; 3,442	668; 3,442
$d = 2$	0.03%†	0.48%*
Standard Error	(0.0002)	(0.0019)
# Obs (FP; NFP)	638; 3,401	638; 3,401
$d = 3$	0.02%	0.48%*
Standard Error	(0.0002)	(0.0022)
# Obs (FP; NFP)	618; 3,325	618; 3,325
$d = 4$	0.01%	0.36%†
Standard Error	(0.0002)	(0.0021)
# Obs (FP; NFP)	639; 3,312	639; 3,312
$d = 5$	-0.01%	0.32%†
Standard Error	(0.0002)	(0.0019)
# Obs (FP; NFP)	646; 3,304	646; 3,304

Overview

- ➊ Data: natural experiment in news positioning
 - ▶ Comparison of articles in absence of diff position
 - ▶ Illustrative results
- ➋ Conceptual framework
- ➌ Causal analysis: effect of news position
- ➍ Effect of positioning vs. effect of importance

News Position vs. News Importance

- **Goal:** compare the effect of news positioning against the effect of news importance

News Position vs. News Importance

- Goal: compare the effect of news positioning against the effect of news importance
- **Estimating effect of importance:** news of different importance in same position
 - 1 Primary important news (always front page)
 - 2 Front page secondary important news

News Position vs. News Importance

Trading Volumes

- Differences in trading volume following primary important vs. front page secondary important news

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Trading Volumes

- Differences in trading volume following primary important vs. front page secondary important news

	Front Page SI News	PI News	Difference
First 5 min	0.10%	0.18%	0.09%
Standard Error	(0.0002)	(0.0005)	(0.0005)
# Observations	678	1,034	–
First 10 min	0.19%	0.30%	0.10%†
Standard Error	(0.0002)	(0.0004)	(0.0005)
# Observations	689	1,061	–
First 60 min	0.79%	1.02%	0.18%
Standard Error	(0.0008)	(0.0010)	(0.0013)
# Observations	721	1,138	–

News Position vs. News Importance

Absolute Price Changes

- Differences in immediate absolute price changes following primary important vs. front page secondary important news

News Position vs. News Importance

Absolute Price Changes

- Differences in immediate absolute price changes following primary important vs. front page secondary important news

	Front Page SI News	PI News	Difference
First 5 min	0.45%	0.80%	0.35%**
Standard Error	(0.0004)	(0.0005)	(0.0005)
# Observations	678	1,034	—
First 10 min	0.60%	0.97%	0.41%**
Standard Error	(0.0007)	(0.0006)	(0.0009)
# Observations	689	1,061	—
First 60 min	1.08%	1.39%	0.42%**
Standard Error	(0.0009)	(0.0007)	(0.0012)
# Observations	721	1,138	—

News Position vs. News Importance

Short-Term Price Drift

- For primary importance indicator PI_s , estimate:

$$Ret_{s,i,[t+t_1,t+t_2]} = \alpha + \beta_1 Ret_{s,i,[t,t+t_1]} + \beta_2 FP_s \\ + \beta_3 Ret_{s,i,[t,t+t_1]} \times FP_s \gamma X_{i,t} + \epsilon_{s,i,t}$$

- ▶ **Time windows:** $(t_1, t_2) \in \{(5 \text{ min}, 10 \text{ min}), (5 \text{ min}, 15 \text{ min})\}$
- ▶ **Controls:** (1) none; (2) month & hour FE; (3) month, hour, ind FE, log size

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- Controls:** (1) none; (2) month & hour FE; (3) month, hour, ind FE, log size

$t_1 = 5 \text{ min}, t_2 = 10 \text{ min}$			$t_1 = 5 \text{ min}, t_2 = 15 \text{ min}$		
(1)	(2)	(3)	(1)	(2)	(3)
-0.016	-0.020	-0.027	-0.025	-0.020	-0.026
(0.043)	(0.044)	(0.044)	(0.045)	(0.045)	(0.045)
# Obs: PI, FP SI:					
1,061	1,061	1,058	1,078	1,078	1,074
689	689	688	699	699	698

Conclusion

- Pinned to top of Bloomberg screen: substantial but relatively short-term market impact

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Conclusion

- Pinned to top of Bloomberg screen: substantial but relatively short-term market impact
- Absent prominent positioning, the articles are indistinguishable by:
 - 1 Target audience of finance professionals
 - 2 Algorithmic analysis
- News positioning has a **stronger** effect than news importance
- Making information public is not enough, how it is presented matters