## Complexity Aversion when Seeking Alpha

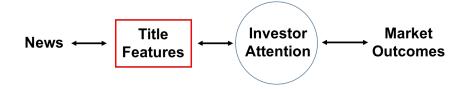
By Tarik Umar

Rice University

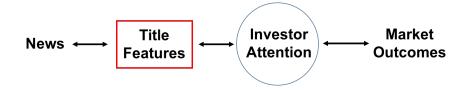
December 31, 2017







- Find title→attention, using field data with randomization
  - Investors attracted to short, simple, negative titles
  - More so for less-sophisticated investors



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  - More so for less-sophisticated investors
- Find attention→markets, instrumenting title length with name length
  - Longer titles lead to less turnover, lower volatility, and underreaction
  - Stronger for subtle news released on quiet days to less-sophisticated investors



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  - Longer titles lead to less turnover, lower volatility, and underreaction
  - Stronger for subtle news released on quiet days to less-sophisticated investors
- Firms and analysts do not fully appreciate these effects

- Overview
- 2 Field Experiment
- 3 Complexity
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## Overview of Empirical Strategy

- Title Features → Attention
  - Measure of attention to a title?
  - Variation in title? holding context fixed?

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## What is Seeking Alpha?

- Leading crowdsourced investment research community
  - 4M registered investors
  - 85 million page views per month
  - 10,000 analysts and 280,000 commenters
  - 100+ stock reports published daily
  - 2.5M investors signed up for real-time alerts
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- Investor Audience
  - 90% of readers own stocks
  - 50% of readers traded in trailing 30 days
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- Sophisticated Audience
  - Over 20% of readers financial professionals
  - Highest % of readers with portfolio assets over \$50k, \$250k, \$1M

#### **Example Stock Report**

#### Titan International Bonds And Stock Look Overpriced

Jul. 23, 2015 10:37 AM ET | 27 comments | About: Titan International Inc. (TWI)



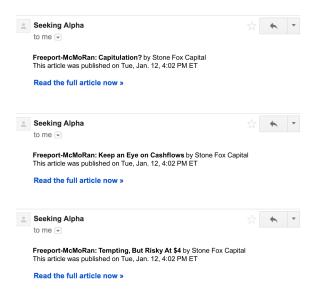
Swaraj Chowdhury, CFA ⊕ Follow (174 followers)
Deep value, hedge fund analyst, industrials, mid-cap
Send Message

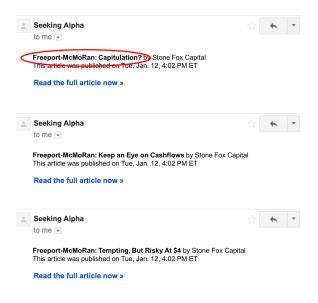
#### Summary

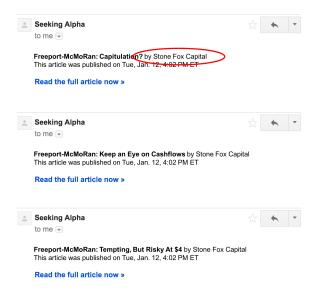
- Leveraged tire/wheel producer dependent on short-term OEM demand from agricultural and mining equipment manufacturers.
- Falling agricultural commodity prices led to reduced farm income, which in turn reduced demand for heavy equipment such as >140 HP tractors and combines.
- Titan's revenue and EBITDA are falling due to lower demand for larger tires and wheels which accompany heavy agricultural and mining equipment.
- Liquidity is comfortable but a combination of negative free cash flows and debt maturities over the next two years can pose challenges if commodity prices remain low.
- Complex org structure where subsidiaries with more than 50% of consolidated revenues do not guarantee their first lien bonds. It is possible for them to borrow more.

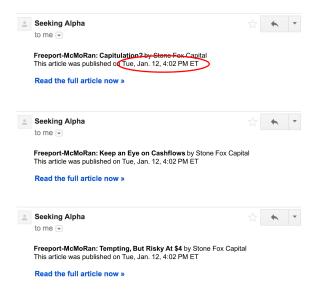
## Overview of Empirical Strategy

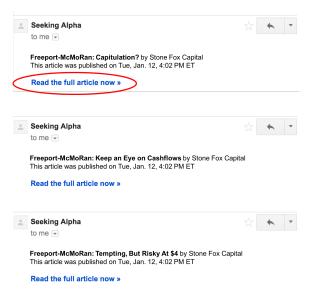
- Title Attributes → Attention
  - Measure of attention to a title?
  - Variation in title? holding context fixed?
- Solution: Title Testing
  - Seeking Alpha began field experiment in Jan 2016
  - Authors propose 2 titles for a report; Editor provides 1 title
  - Emails sent to investors tracking firm with random assignment of title
  - After 30 minutes, title with most views published











## **Example Titles**

- Mallinckrodt
  - Mallinckrodt: Is it a one hit wonder?
  - Is Mallinckrodt a one hit wonder?
- Tidewater
  - Tidewater: Can the company avoid bankruptcy?
  - Can Tidewater avoid bankruptcy?
- Wal-Mart
  - Wal-Mart makes progress but is it enough?
  - Wal-Mart: Progress, but is it enough?

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# **Measuring Complexity**

- Title Length (characters)
- Word Count
- Word Length
- Word Familiarity/Frequency

# **Empirical Specification**

$$\mathsf{Views}/\mathsf{Emails}_{i,j} = \beta \ \mathsf{Title} \ \mathsf{Complexity}_{i,j} + \alpha_j + \epsilon_{i,j}$$

- title *i* for stock report *j*
- ullet eta: effect of textual complexity on attention
- $\alpha_j$ : holds constant firm, analyst, event, and date

	Page Views/Emails (1) (2) (3) (4)
Title Length	0.04***
Average Word Length	(0.01)
Number of Words	
Frequency of Least Common Word in Title	e
Article FE	No
Adjusted R <sup>2</sup> Within R <sup>2</sup>	0.03
Num. Articles	9947
Observations	22629

- $\bullet$  Std dev increase in title length  $\to$  12% fewer views
- ullet Std dev increase in VIX ightarrow 8% more views

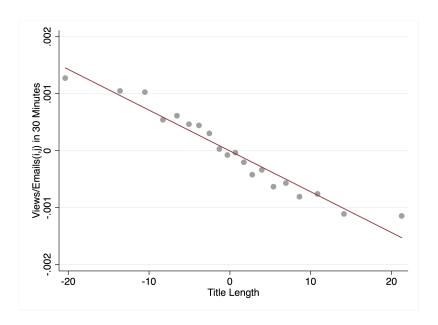
	Page Views/Emails		
	(1)	(2)	(3)(4)
Title Length	0.04***	-0.11***	
Average Word Length	(0.01)	(0.00)	
Number of Words			
Frequency of Least Common Word in Title			
Article FE	No	Yes	
Adjusted R <sup>2</sup> Within R <sup>2</sup>	0.03	0.91	
Within R <sup>2</sup>		0.06	
Num. Articles	9947	9947	
Observations	22629	22629	

- $\bullet$  Std dev increase in title length  $\to$  10% fewer views
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- Longer words and more words repel attention

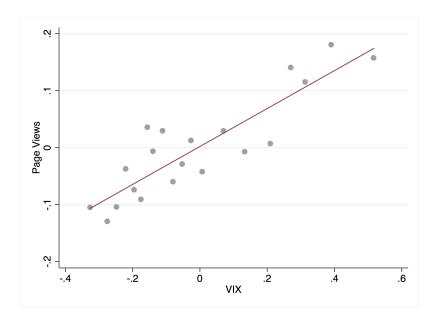
	Page Views/Emails			
	(1)	(2)	(3)	(4)
Title Length	0.04***	-0.11***	•	
	(0.01)	(0.00)		
Average Word Length			-0.05***	
			(0.00)	
Number of Words			-0.11***	
Frequency of Least Common Word in Title			(0.00)	
Article FE	No	Yes	Yes	
Adjusted R <sup>2</sup>	0.03	0.91	0.91	
Within R <sup>2</sup>		0.06	0.06	
Num. Articles	9947	9947	9947	
Observations	22629	22629	22629	

- $\bullet$  Std dev increase in title length  $\to$  10% fewer views
- ullet Std dev increase in VIX ightarrow 8% more views
- Longer words and more words repel attention
- Rare words grab attention

-	Page Views/Emails			
	(1)	(2)	<sup>'</sup> (3)	(4)
Title Length	0.04***	-0.11***		
	(0.01)	(0.00)		
Average Word Length			-0.05***	-0.05***
N 1 634/ 1			(0.00)	(0.00)
Number of Words			-0.11***	-0.11***
E CL . C . M. L. T. L			(0.00)	(0.00)
Frequency of Least Common Word in Title				-0.01
				(0.00)
Article FE	No	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.03	0.91	0.91	0.91
Within R <sup>2</sup>		0.06	0.06	0.06
Num. Articles	9947	9947	9947	9947
Observations	22629	22629	22629	22629



# Complexity and VIX



# Complexity and Screen Size

- aaaaaaaaaaaaaaaaaaaaaa
- aaaaaaaaaaaaaaaaaaaaaaaaaaaaa

	Views/Emails			
	(1)	(2)	(3)	
Title Length	-0.13***	-0.12***	-0.12***	
_	(0.05)	(0.01)	(0.04)	
Short or Long Titles	Very	Middle(>	Long	
_	Short	33&<	$(\ge 65)$	
	$(\leq 25)$	65)		
Article FE	Yes	Yes	Yes	
Num. Articles	92	584	564	
Observations	196	1294	1179	

## Complexity by Character

• Incremental increases in character count lead to less attention

	Views/Emails			
	(1)	(2)	(3)	(4)
Title Length	-0.11	-0.16	-0.18**	-0.18***
_	(0.28)	(0.13)	(80.0)	(0.06)
Max Character Difference in Length	1	2	3	4
Article FE	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.91	0.91	0.91	0.91
Within R <sup>2</sup>	0.00	0.00	0.00	0.01
Num. Articles	577	914	1266	1632
Observations	1154	1828	2532	3264

## **Complexity and Content**

- Aversion to length holds for titles with highly similar content
- Very similar headlines
  - Mallinckrodt: Is it a one hit wonder?
  - Is Mallinckrodt a one hit wonder?
- Very different headlines
  - No Real Catalyst For Invesco Mortgage?
  - Invesco's Dividend Is Secure...For Now

	Views/Emails			
	(1)	(2)	(3)	
Title Length	-0.12***	-0.11***	-0.11***	
•	(0.05)	(0.01)	(0.02)	
Word Overlap	High	Middle	Low	
Article FE	Yes	Yes	Yes	
Adjusted R <sup>2</sup>	0.92	0.92	0.90	
Within R <sup>2</sup>	0.02	0.06	0.08	
Num. Articles	344	6268	410	
Observations	688	12536	820	

## Complexity and Pixel Length

# Complexity and Pixel Length

ullet Optical title length o Fewer views

	Views/Emails		
	(1)	(2)	(3)
Title Pixel Length	-0.02	0.04	-0.10**
	(0.03)	(0.04)	(0.05)
# Characters in Title FE	Yes	Yes	Yes
Avg Title Length	All	< 45	$\geq$ 45
Article FE	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.91	0.91	0.91
Within R <sup>2</sup>	0.00	0.00	0.00
Num. Articles	9947	4244	5703
Observations	22629	9764	12865

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## **Measuring Sentiment**

- Lexicons
  - Lists of Positive and Negative Words
  - 75% of titles have no matches
  - Equal weights, ignores combinations

### **Attraction to Negative Titles**

- Standard deviation increase in negativity → 2% more views
- Stronger for less-sophisticated investors
- Magnitude declines 20% when control for complexity

		Views/Emails			
	(1)	(2)	(3)	(4)	(5)
Net Sentiment	0.002	-0.021***	-0.017***	-0.015***	
	(0.008)	(0.003)	(0.003)	(0.00)	
Net Sentiment x Numerical Comments				0.008**	
				(0.004)	
Positive Sentiment					-0.017***
					(0.003)
Negative Sentiment					0.007**
					(0.003)
Title Length			-0.106***	-0.106***	-0.105***
			(0.003)	(0.004)	(0.004)
Article FE	No	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.02	0.90	0.91	0.91	0.91
Within R <sup>2</sup>	0.00	0.00	0.07	0.07	0.07
Num. Articles	9947	9947	9947	9538	9947
Observations	22629	22629	22629	21731	22629

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# Complexity & Cognitive Abilities

• Investors less sensitive to title length read-to-end (RTE) more

	Read-to-	End Rate
	(1)	(2)
Title Length	0.21***	0.17***
	(0.02)	(0.01)
Article FE	No	Yes
Adjusted R <sup>2</sup>	0.04	0.72
Within R <sup>2</sup>	0.04	0.05
Number of Articles	1687	1687
Observations	4008	4008

# Complexity & Cognitive Abilities

### • Stronger for less-sophisticated investors

			Page	e Views/Er	nails		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Title Length	-0.11***	-0.11***	-0.11***	-0.11***	-0.11***	-0.11***	-0.11***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
× Market Cap	-0.02***						
E 11	(0.00)	0.00***					
× Followers		-0.02***					
× Non-Analyst		(0.00)	-0.01***				
x Non-Analyst			(0.00)				
× Comment Length			(0.00)	0.01*			
x comment zengm				(0.00)			
x Numerical Comments				(5.55)	0.01**		
					(0.00)		
x Finance Professionals						0.03***	
						(0.01)	
x MBA or CFA							0.02***
A: - L. EE	V	V	V	V	V	V	(0.00)
Article FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Within R <sup>2</sup>	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Num. Articles	9538	9538	9538	9538	9538	9538	9538
Observations	21725	21731	21731	21731	21731	21725	21725
Standard errors in pare	ntheses						
* $p < 0.10$ , ** $p < 0.0$	5. *** p	< 0.01					

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- Credit Cards
  - Visa
  - Mastercard
  - American Express
- Fast Food
  - Sonic
  - Wendys
  - Jack In The Box
- Pharma Distribution
  - McKesson
  - Cardinal Health
  - AmerisourceBergen

 After controlling for firm size, name length unrelated to firm characteristics

	Name Length			Adj	Name Leng	ţth		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total Assets	-0.14*** (0.00)							
Market Capitalization	(0.00)	-0.02 (0.02)						
Institutional Ownership		(0.02)	-0.00 (0.02)					
Revenue			(0.02)	-0.01 (0.02)	-0.04 (0.03)			
COGS				(0.02)	0.03			
Earnings Surprise					(0.03)	0.00 (0.05)		
Market Beta						(0.03)	0.01 (0.01)	
Age (since IPO)							(0.01)	-0.02 (0.02)
Adjusted R <sup>2</sup>	0.07	-0.13	-0.12	-0.13	-0.14	-0.12	-0.11	-0.11
Within R <sup>2</sup> Observations	0.01 146020	0.00 146020	0.00 146020	0.00 136043	0.00 136043	0.00 79302	0.00 125043	0.00 49966

- Longer names predict longer titles
- F-statistic 128

	(1) Title	(2) Length Name	(3) Views/	(4) Views/	(5) Read-to-	(6) Read-to-
	Length OLS	in Title OLS	Emails OLS	Emails IV		End Rate IV
Legal Name Length	0.15*** (0.01)	0.39*** (0.01)				
Legal Name Length <sup>2</sup>	-0.04*** (0.01)	-0.09*** (0.01)				
Title Length	( )	,	-0.10*** (0.01)	-0.16*** (0.06)	0.14*** (0.02)	0.52** (0.27)
Market Capitalization			-0.16*** (0.01)	-0.16** (0.01)	-0.26*** (0.04)	-0.24*** (0.05)
Number of Email Subscribers			-0.56*** (0.01)	-0.56** (0.01)	-0.17*** (0.05)	-0.14*** (0.05)
% Adjusted R <sup>2</sup>	0.12	0.37	0.58		0.30	
% Within R <sup>2</sup>	0.01	0.10	0.33		0.12	
Number of Articles	9944	9944	9944	9944	1686	1686
Observations	22623	22623	22623	22623	4006	4006

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- Question: Does any of this matter beyond Seeking Alpha investors?
- Challenge: Press-release titles are endogenous
  - Need variation in length unrelated to earnings surprise
- Solution
  - Instrument title length with the length of firm's name
- Results
  - Market volatility and volume lower for longer titles
  - Evidence of price underreaction for longer titles
  - Larger effects when anticipated benefits lower

- Data
  - PR Newswire and Business Wire
  - Dates: 1988 to 2016
  - Extract earnings announcements
  - Match with CRSP and Compustat
  - Final sample: 480,718 releases for 15,335 firms

Unique Fabricating, Inc. reports third quarter revenues of \$39.6 million; adjusted diluted earnings per share of \$0.18

Piedmont Natural Gas reports results for fiscal year 2015

Navistar reports fourth quarter results

Xtl Biopharmaceuticals reports third quarter 2015 results and confirms intention to start lupus trial in 2016

Mitcham Industries reports fiscal 2016 third quarter results

Crossroads Systems reports fiscal fourth quarter and full year 2015 financial results

Regeneron reports third quarter 2015 financial and operating results

Rice Midstream Partners LP reports third quarter 2015 results

Dynasil Corporation of America reports fiscal year 2015 financial results

China Zenix Auto International Limited announces unaudited financial results for the third quarter of 2015

Copa Holdings reports net income of US\$6.2 million and eps of US\$0.14 for the third quarter of 2015

Landauer, Inc. reports fiscal 2015 fourth guarter and full year results

Taylor Morrison reports third quarter revenue of \$796 million and earnings per share of \$0.37

Sigma-Aldrich (NASDAQ SIAL) reports Q3 2015 sales of \$703 million and adjusted diluted eps of \$1.00

Neogen reports 16% increase in net income

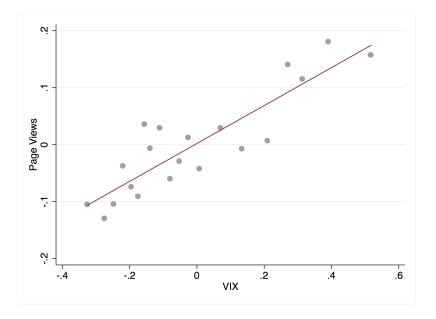
Servotronics, Inc. announces results for the three and nine months ended September 30, 2015

- Name length highly relevant for title length of press releases
- F-Statistic is 1338

	Т	itle Leng	th
	(1)	(2)	(3)
Log Length of Firm Name	0.15***	0.13***	0.15***
	(0.00)	(0.00)	(0.00)
Log Market Capitalization(t-3)			0.08***
			(0.01)
Date FE	No	Yes	Yes
$SIC \times Year FE$	No	SIC-4	SIC-4
Adjusted R <sup>2</sup>	0.06	0.10	0.10
Within R <sup>2</sup>	0.02	0.02	0.02
Observations	421293	421293	421293

	Turnover (t) IV (1)	Trade Count (t) IV (2)	Intraday Range (t) IV (3)	Volatility (t) IV (4)	Return (t) IV (5)	Return (t) IV (6)	Return (t+1,t+90) IV (7)
Title Length (t)	-0.043*** (0.01)	-0.038*** (0.01)	-0.095*** (0.02)	-0.042*** (0.01)	0.118*** (0.03)	0.009***	-0.012** (0.006)
× Positive Surprise (t)	(0.01)	(0.01)	(0.02)	(0.01)	-0.144***		0.010
Positive Surprise (t)					(0.04) 0.476*** (0.01)	(0.003) 0.033*** (0.001)	(0.008) 0.020*** (0.001)
Market Cap (t-3)	-0.053***	0.000	-0.142***	-0.037***	-0.030***		-0.006* <sup>*</sup> *
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.000)	(0.001)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIC-4 × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	417876	218360	421297	421293	263947	263947	261942



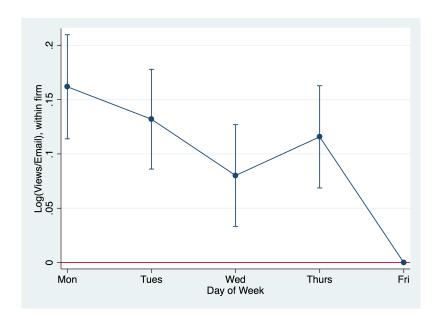


### **VIX**

• Stronger when VIX is lower

	Turnover
Title Length	-0.045*** (0.014)
Title Length x VIX	0.028*** (0.007)
SIC-4 x Year FE	Yes
Annc Date FE	Yes
Firm Controls	Yes
Observations	421560

# **Slow Days**

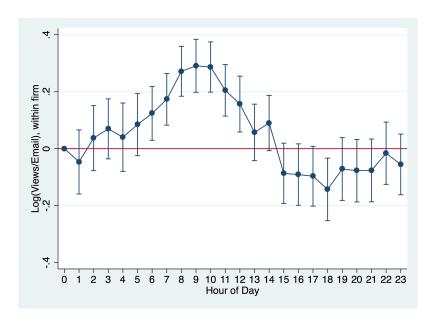


# Slow Days

- Stronger on days with less other news
  - 55% of slow days are Fridays
  - Michaely et al. (2016): Friday effect due to selection bias

	Turnover
Title Length	-0.044*** (0.014)
Title Length x Number Earnings Releases	(0.009)
SIC-4 x Year FE	Yes
Annc Date FE	Yes
Firm Controls	Yes
Observations	421560

# **Afternoons**



### **Afternoons**

• Stronger for news released in the afternoon

	Turnover
Title Length	-0.011 (0.011)
Title Length × Afternoon	-0.061** (0.028)
SIC-4 × Year FE	Yes
Annc Date FE	Yes
Firm Controls	Yes
Observations	421560

# Sophistication of Investor Base

• Stronger when less shares held by institutional investors

	Turnover
Title Length	-0.041** (0.018)
$\widehat{Title\ Length} \times 13F\ Ownership$	0.024*
13F Ownership	(0.013) 0.049***
SIC-4 x Year FE	(0.004) Yes
Annc Date FE	Yes
Firm Controls	Yes
Observations	421560

# **Analyst Coverage**

• Stronger for firms without analyst coverage

	Turnover
Title Length	-0.061***
_	(0.021)
Title Length x Analyst	$0.037^{*}$
	(0.020) 0.086***
Analyst	
	(0.003)
SIC-4 x Year FE	Yes
Annc Date FE	Yes
Firm Controls	Yes
Observations	421560

# **Earnings Surprise**

• Stronger when earnings announcement is less surprising

$ \begin{array}{llllllllllllllllllllllllllllllllllll$		Turnover
	Title Length	
Abs. Earnings Surprise (0.014)  O.005*** (0.002)  SIC-4 × Year FE Yes  Annc Date FE Yes  Firm Controls Yes		,
Abs. Earnings Surprise         0.005***	Title Length x Abs. Earnings Surprise	
(0.002)           SIC-4 x Year FE         Yes           Annc Date FE         Yes           Firm Controls         Yes		(0.014)
SIC-4 x Year FE Yes Annc Date FE Yes Firm Controls Yes	Abs. Earnings Surprise	
Annc Date FE Yes Firm Controls Yes		
Firm Controls Yes		
	, 2 atto . =	
Observations 421560		
	Observations	421560

### Take Aways

- Using title-testing data from Seeking Alpha,
  - Evidence of pure complexity aversion exhibited by engaged investors
  - Attraction to negative titles, if net long
  - Stronger for less-sophisticated investors
- Instrumenting earnings announcement headlines,
  - Causal evidence attention affects market responses to news
  - Market less attentive to longer headlines (less turnover and volatility)
  - Evidence consistent with a price underreaction
  - Stronger when anticipated benefits less (slow days, subtle news)

# **Complexity Aversion on SSRN**

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# Complexity Aversion on SSRN

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Log Abstract Length			0.01***
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Week FE	No	Yes	Yes
Author FE	No	Yes	Yes
Adjusted R <sup>2</sup>	0.01	0.66	0.81
Within R <sup>2</sup>		0.00	0.58
Num. Academics	50010	50010	50010
Observations	295349	295349	295349
Clustering SE	Author	Author	Author