

Home-country media slant and equity prices

Benjamin Golez

University of Notre Dame



Rasa Karapandza

European Business School



Not all news is created equal...

- **The Wall Street Journal:**
 - U.S. edition
 - Europe edition
- **Two companies:**
 - U.S. company: General Motors
 - European company: Volkswagen

General Motors: Faulty ignition switches

The Wall Street Journal (Europe Edition)

GM Will Pay Big Penalty In Criminal Settlement

Lead journalist: Mike Spector

18 September 2015

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Volkswagen: 'Dieselgate'

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Lead journalist: William Boston
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By William Boston,
Amy Harder
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The company could face billions of dollars in fines and the crisis could further weaken Volkswagen Chief Executive Martin Winterkorn's position. He narrowly survived efforts by a major shareholder to oust him earlier this year and was passed over for the chairman's job, the company's top post, this month.

"I personally am deeply sorry that we have broken the trust of our customers and the public," Mr. Winterkorn said in a statement issued by the company on Sunday, adding that Volkswagen is cooperating with authorities and has commissioned an external probe.

On Friday, the U.S. Environmental Protection Agency and the California Air Resources Board alleged that Volkswagen used software, dubbed a "defeat device," in the cars to make diesel-powered engines appear to have lower levels of emissions than they actually did. About 482,000 Volkswagen diesel-powered cars are affected.

The EPA probe could force Volkswagen and its Audi AG unit to recall thousands of vehicles that contain the company's "clean diesel" engines.

The four-cylinder 2.0-liter turbo direct injection, or TDI, engine is commonly found in Volkswagen's Passat, Jetta, Golf, Beetle and in Audi's A3 luxury compact model.

Following the EPA announcement, Volkswagen halted the sale of all 2015 and 2016 models containing the four-cylinder 2.0 liter TDI engine, a company spokesman said on Sunday. The EPA investigation affects cars going back to 2008. The spokesman said the company has still not issued a recall.

The investigation comes at a critical time for the auto maker, which is based in Wolfsburg, Germany. Volkswagen's namesake brand has been battling declining sales in the U.S. market. Audi, its luxury car maker, is finding it hard to catch up in the U.S. with rivals BMW AG and Daimler AG, which makes Mercedes-Benz vehicles.

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Officials alleged that Volkswagen used software that activates full emissions controls only during testing but then reduces their effectiveness during normal driving. The result is that cars can emit nitrogen oxides at up to 40 times the allowable standard, the agency said. Diesel-powered cars are a small part of overall U.S. car and light-truck sales.

"Using a defeat device in cars to evade clean-air standards is illegal and a threat to public health," said Cynthia Gies, assistant administrator for the agency's enforcement group. She later added: "These violations are very serious. We expected better from VW."

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Volkswagen: 'Dieselgate'

The Wall Street Journal (Europe Edition)

Lead journalist: William Boston
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Amy Harder
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Even prior to the emissions issue, the auto maker's namesake Volkswagen brand has been battling declining sales in the U.S. market. And Audi AG, its luxury car maker, is finding it hard to catch up in

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Overall tone:
-2.15

In this paper, we show that...

...in a large news data covering automotive industry in the U.S., Germany, and Japan:

1. *National newspapers systematically report more favorably about home companies than about foreign companies.*
2. *The evidence is most consistent with the notion of media catering to home readers.*
3. *Differences in the tone of news across countries predict equity returns and temporary price deviations of cross-listed stocks.*

The role of media in finance

- A large body of work studies biases in news reporting and the effects of such biases on financial markets (Anderson, Waldfogel, Stromberg, 2015; Tetlock, 2015):
 - **Focus on domestic media**; cross-country evidence mostly anecdotal (Gentzkow and Shapiro, 2006; Bie and Billings, 2005)
 - **National newspapers as a yardstick** to measure biases in:
 - Financial media (Reuter and Zitzewitch, 2006)
 - Local media (Gurun and Butler, 2012)
- **In our paper:**
 - We show that national newspapers are also biased and that such biases become apparent in cross-country comparisons.
 - Cleaner setup to test the relation between media reporting and equity prices:
 - Media markets across countries segmented (language barriers and geographic distances)
 - Stocks cross-listed

Why automotive industry?

1. Special (iconic) status of car industry:
 - Important for national economies
 - Car brands as symbols of national identity and pride
2. Car companies compete at the international level:
 - Substantial media coverage across countries
3. Car companies are cross-listed:
 - Important for tests of media effects on stock prices

Main data: Prime Research

- A leading company in the field of media analysis for the automotive industry:
 - Data coded by **trained native speakers** in eight research centers around the globe.
- Data coded up to the level of a [segment of an article](#) (title/paragraph/self-contained message):
 - **News tone:** Discrete scale from -4 to +4
 - Other variables:
 - Eight general topics of news (e.g., financial performance, market structure, ecology)
 - Time dimension of news (past/present/future event)
 - Reference to experts, financial institutions, public entities
 - Visibility (reach)
 - Etc.

Main data: Three by three...

- “**Big Three**” from each of the **three major car-producing countries**:

- **U.S.:** Ford, General Motors, Chrysler*
- **Germany:** BMW, Daimler AG, Volkswagen
- **Japan:** Toyota, Honda, Nissan



35 car brands / around 70% of global car production

*Chrysler included until 2014 when it was acquired by Fiat (Italian car producer)

- January **2007** – December **2016**
- **773,303** observations (segments) for which tone is assigned:
 - 188,118 articles
 - 186 national newspapers (86 American, 85 German, and 15 Japanese)

Home-country media slant: Preliminary evidence

	American companies			German companies			Japanese companies		
	GM	Ford	Chrysler	VW	Daimler	BMW	Toyota	Nissan	Honda
Panel A: Home media news tone									
Mean	0.23	0.67	0.28	0.62	0.86	1.15	0.49	0.61	0.53
No. of obs.	(107,000)	(60,819)	(42,948)	(192,115)	(74,318)	(40,660)	(21,585)	(7,557)	(7,071)
Panel B: Foreign media news tone									
Mean	-0.18	0.13	-0.60	-0.32	0.73	0.91	0.16	0.54	0.22
No. of obs.	(67,668)	(14,180)	(10,242)	(35,866)	(9,130)	(7,283)	(50,424)	(10,836)	(13,601)
Panel C: Home media news tone - foreign media news tone									
	0.41	0.54	0.88	0.94	0.13	0.24	0.33	0.07	0.31

Home-country media slant: Regression analysis

- Regress **the tone of news of each news segment** on a **home dummy** and a set of fixed effects and control variables:

$$News\ Tone_{t,i,c} = \alpha + \beta Home\ dummy_{t,i,c} + \delta FE_{t,i,c} + \lambda News\ variables_{t,i,c} + \varepsilon_{t,i,c}$$

$$Home\ dummy = \begin{cases} 1, & \text{home - country news} \\ 0, & \text{otherwise.} \end{cases}$$

- **Fixed effects:** Country effects / country-of-origin effects / company and time effects / newspaper effects / journalist effects / coder effects
- **News specific controls:** Visibility / photo/ unknown journalist / editorial board / references to experts, financial institutions, public entities / number of newspapers per country
- **Errors** clustered by company (*similar, if clustered by year-month or by newspaper*).

Home-country media slant: Pooled panel

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
							Major newspapers		U.S. –G.	U.S. –J.	G. –J.
Home dummy	0.58	0.59	0.37	0.30	0.28	0.28	0.27	0.24	0.27	0.46	0.09
t-stat.	(6.56)	(6.91)	(8.75)	(9.71)	(9.17)	(9.31)	(10.15)	(10.85)	(16.97)	(13.66)	(4.45)
Visibility						-0.00	-0.00	-0.00	-0.00	-0.00	0.00
t-stat.						(-1.38)	(-1.27)	(-0.56)	(-0.79)	(-1.39)	(0.19)
Photo						0.15	0.16	0.13	0.16	0.14	0.17
t-stat.						(7.02)	(5.75)	(4.92)	(6.88)	(3.52)	(10.51)
Journalist unknown						0.01	0.05	-0.69	0.01	-0.05	0.06
t-stat.						(0.41)	(2.59)	(-1.68)	(0.60)	(-2.82)	(3.02)
Editorial board						-0.11	-0.72	-1.38	-0.09	-0.24	0.11
t-stat.						(-1.01)	(-4.13)	(-3.72)	(-0.72)	(-1.43)	(0.68)
Expert						-0.20	-0.24	-0.26	-0.26	-0.09	-0.41
t-stat.						(-2.62)	(-6.42)	(-10.59)	(-3.36)	(-1.54)	(-2.50)
Financial Inst.						-0.29	-0.27	-0.26	-0.31	-0.28	-0.32
t-stat.						(-7.22)	(-2.83)	(-2.95)	(-7.38)	(-4.29)	(-9.33)
Public entity						-0.24	-0.19	-0.14	-0.21	-0.17	-0.48
t-stat.						(-2.46)	(-1.78)	(-1.39)	(-2.34)	(-2.14)	(-11.43)
Number of newspapers						0.01	0.00	0.00	0.01	-0.01	0.00
t-stat.						(1.79)	(0.50)	(0.59)	(5.00)	(-2.42)	(0.79)
Fixed effects											
Country	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-of-origin	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Company × Year-month	-	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Coder	-	-	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Newspaper	-	-	-	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Journalist	-	-	-	-	-	-	-	Yes	-	-	-
N	773,303	773,303	773,303	773,303	773,303	773,303	118,847	118,847	642,657	311,478	373,241
R²	0.02	0.07	0.23	0.25	0.26	0.26	0.25	0.29	0.26	0.22	0.32

Home-country media slant: Pooled panel

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
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Fixed effects											
Country	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-of-origin	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Company × Year-month	-	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Coder	-	-	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Newspaper	-	-	-	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Journalist	-	-	-	-	-	-	-	Yes	-	-	-
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t-stat.						(1.79)	(0.50)	(0.59)	(5.00)	(-2.42)	(0.79)
Fixed effects											
Country	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-of-origin	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Company × Year-month	-	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Coder	-	-	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Newspaper	-	-	-	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Journalist	-	-	-	-	-	-	-	Yes	-	-	-
N	773,303	773,303	773,303	773,303	773,303	773,303	118,847	118,847	642,657	311,478	373,241
R²	0.02	0.07	0.23	0.25	0.26	0.26	0.25	0.29	0.26	0.22	0.32

Media slant: Similar news

- Subsamples of similar news reported in all three countries within the same week:
 - Results driven by more positive article spin in home countries rather than selective media coverage

Same year-week and brand	Yes		
Same year-week, brand and topic		Yes	
Same year-week, brand, topic, and time			Yes
Home dummy	0.29	0.31	0.29
t-stat.	(7.85)	(7.77)	(6.82)
Fixed effects	Yes	Yes	Yes
News variables	Yes	Yes	Yes
N	465,056	272,221	196,022
R2	0.27	0.30	0.32

Media slant: News verifiability

- General topic of news:
 - **Low** (easy to verify): Company structure, market position
 - **Medium**: Corporate strategy, product strategy, financial performance and management
 - **High** (difficult to verify): CSR/ecology, employee relations
- Time reference of news:
 - **Past/Present/Future**

	Low	Medium	High
Past	0.05	0.22	0.26
Present	0.09	0.30	0.32
Future	0.17	0.28	0.63

t-stat.=1.74

t-stat.=5.12

Media slant: Car scandals & announcements of car recalls

- VW scandal:
 - Sept 18, 2015 - Dec 31, 2015
- Toyota crisis:
 - Aug 28, 2009 – Jan 31, 2010
- Recalls (U.S.):
 - Report dates (by brand)
- [Market valuations](#)

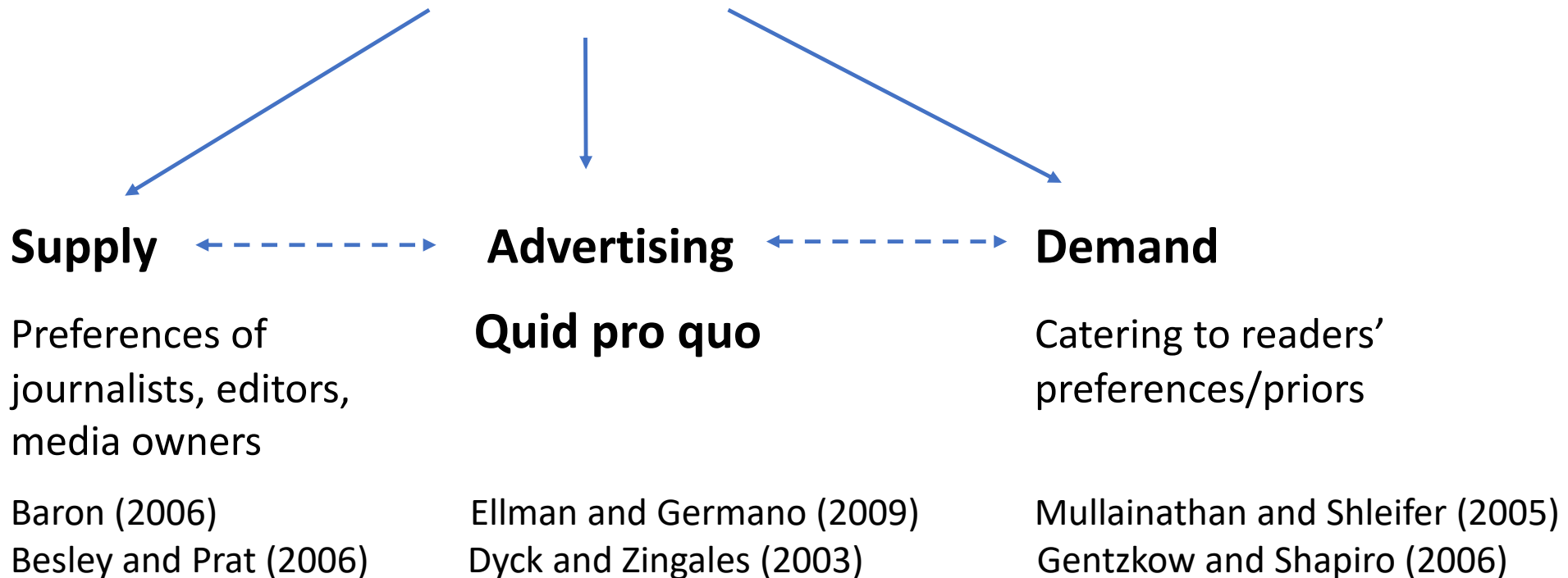
	[1]	[2]	[3]	[4]	[5]	[6]
				Recalls		
				≥5,000	≥50,000	≥500,000
				N = 551	N = 277	N = 64
Home dummy	0.28	0.25	0.28	0.28	0.28	0.28
t-stat.	(9.31)	(6.60)	(9.49)	(9.00)	(9.05)	(9.21)
VW scandal		-2.88				
t-stat.		(-26.22)				
Home dummy × VW scandal		0.58				
t-stat.		(6.27)				
Toyota crisis			-1.21			
t-stat.			(-26.02)			
Home dummy × Toyota crisis			0.46			
t-stat.			(5.53)			
Recall				-0.34	-0.51	-0.65
t-stat.				-(4.87)	(-5.07)	(-5.10)
Home dummy × Recall				0.29	0.47	0.88
t-stat.				(3.29)	(3.10)	(3.06)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	773,303	773,303	773,303	773,303	773,303	773,303
R ²	0.26	0.26	0.26	0.26	0.26	0.26

The Wall Street Journal: U.S. versus European edition

- Same ultimate owner
- Many articles written by the same journalist and published on the same day
- Both editions coded by the same coders

	[1]	[2]	[3]	[4]
Home dummy	0.19	0.16	0.16	0.13
t-stat.	(2.30)	(4.79)	(4.75)	(3.21)
Visibility			0.00	0.00
t-stat.			(0.06)	(1.34)
Photo			0.04	0.01
t-stat.			(1.93)	(0.21)
Expert			-0.29	0.21
t-stat.			(-3.52)	(-4.76)
Financial Inst.			-0.17	-0.12
t-stat.			(-1.86)	(-1.04)
Public entity			-0.12	-0.16
t-stat.			(-1.24)	(-2.16)
Fixed effects				
Country	-	Yes	Yes	Yes
Country-of-origin	-	Yes	Yes	Yes
Company × Year-week	-	Yes	Yes	Yes
Coder	-	Yes	Yes	-
Journalist	-	Yes	Yes	-
Coder × Journalist	-	-	-	Yes
N	43,126	43,126	43,126	25,834
R ²	0.00	0.37	0.37	0.45

What drives home-country media slant?



The relative importance of supply and demand factors primarily depends on (Gentzkow and Shapiro, 2008):

- The competitiveness of the media space
- Heterogeneity of readers views/preferences for news

What drives home-country media slant?

Our setting: News about **car companies** in **national newspapers**:

- Special / iconic status of car industry in the analyzed countries
- In each country, many newspapers compete for readers at the national level.

Catering to readers priors / views as a likely explanation for home-country media slant

Supporting empirical evidence:

- **The Wall Street Journal case**
- Results robust to controlling for journalist and newspaper fixed effects (major newspapers)
- Results robust to controlling for lagged sales
- Country-pair variation appears aligned with proxies for national pride and political relations

Home-country media slant and equity prices

- Home-country media slant may (Tetlock, 2015):
 - **Reflect** cross-country differences in investor beliefs
 - **Reinforce** cross-country differences in investor beliefs
- Rational investors may (*try to*) undo the effect of media slant. At least two limiting factors:
 - National newspapers create **common knowledge**: As other may trade on the news, it may be risky to trade against the crowd (De Long et al., 1990).
 - **Media markets** across countries **segmented** (language barriers): Difficult to disentangle media slant from the news about the underlying event being reported
- Two tests:
 - **Domestic stock returns**
 - **Cross-listed stocks**

Media slant and domestic stock returns

- Our companies held predominantly by home investors (Bloomberg).
- **Hypothesis:** If news tone captures investor beliefs, abnormally high home media tone may be associated with temporary stock price overvaluations and low future returns.
- Monthly frequency (Gurun and Butler, 2012):
 - **Home news tone:** Visibility-weighted news tone in home newspapers
 - **Foreign news tone:** Visibility-weighted news tone in foreign newspapers
- Trading strategy: **‘Betting against the home media’**:
 - **Short**; if home news tone is *higher* than foreign news tone, and the difference between the news tones is higher than its cross-sectional median.
 - **Long**; otherwise.

Betting against the home media

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	All companies				Long/Short portfolio			
	Value-weighting		Equal-weighting		Value-weighting		Equal-weighting	
Sharpe Ratio	0.08		0.28		0.84		0.54	
Intercept	-0.24	0.02	0.09	0.29	2.39	2.24	1.46	1.48
	(-0.57)	(0.03)	(0.21)	(0.60)	(3.42)	(2.93)	(2.37)	(2.18)
Mkt – Rf	0.91	0.79	1.22	1.06	-0.77	-0.65	-0.67	-0.60
	(10.29)	(6.70)	(13.48)	(8.95)	(-5.31)	(-3.41)	(-5.33)	(-3.58)
SMB		-0.13		0.03		-0.47		-0.48
		(-0.40)		(0.10)		(-0.93)		(-1.06)
HML		0.30		0.57		0.09		-0.39
		(0.90)		(1.73)		(0.16)		(-0.83)
RMW		-0.41		0.06		-0.06		-0.38
		(-0.84)		(0.12)		(-0.07)		(-0.53)
CMA		-0.51		-0.90		0.92		0.49
		(-1.27)		(-2.23)		(1.43)		(0.84)
N	120	120	120	120	120	120	120	120
R ²	0.47	0.48	0.61	0.63	0.19	0.23	0.19	0.21

*Monthly rebalancing, N-W t-stats with 6 lags.

Media slant and cross-listed stocks

- **Domestic returns:** One price per company: difficult to control for all the possible sources of risk and differences in company characteristics.
- **Cross-listed stocks:**
 - **Two prices, two news tones...**
 - Equity holders across countries entitled to the same cash flows
 - Daily frequency / additional tests:
 - Confirmatory bias
 - Distracted investors

Media slant and cross-listed stocks

- American and German car companies:
 - American companies cross-listed in Germany; German companies traded in the U.S. as ADRs and/or global shares
- Synchronous prices:
 - Currency and time matched unadjusted opening/closing prices
- Panel predictive regression (daily frequency):

$$\left(\frac{P_{t,i}^{Home} - P_{t,i}^{Foreign}}{P_{t,i}^{Home}} \right) = \alpha + \beta \left(Home\ news\ tone_{t,i} - Foreign\ news\ tone_{t,i} \right) + \lambda Controls_{t,i} + \varepsilon_{t,i}$$

Errors clustered by trading day.

Media slant and cross-listed stocks

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	News reported at least in one country				News reported in home and foreign country			
Home news tone	0.26		0.23		0.26		0.24	
t-stat.	(4.82)		(4.21)		(3.16)		(2.89)	
Foreign news tone	-0.12		-0.09		-0.09		-0.09	
t-stat.	(-2.03)		(-1.57)		(-1.39)		(-1.45)	
Home news tone – foreign news tone		0.19		0.16		0.14		0.14
t-stat.		(4.28)		(3.58)		(2.47)		(2.41)
Rel. stock price diff. (t–1)			0.06	0.06			0.02	0.02
t-stat.			(2.96)	(2.97)			(0.67)	(0.68)
Rel. stock price diff. (t–2: t–6)			0.16	0.16			0.19	0.19
t-stat.			(3.87)	(3.88)			(3.29)	(3.29)
Log(Visibility home news)			-0.03	-0.04			-0.05	-0.06
t-stat.			(-1.15)	(-1.20)			(-0.74)	(-0.92)
Log(Visibility foreign news)			-0.02	-0.02			-0.05	-0.06
t-stat.			(-1.41)	(-1.28)			(-0.93)	(-1.08)
N	10,058	10,058	10,048	10,048	5,596	5,596	5,587	5,587
R ²	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01

Confirmatory bias

- People perceive news as more credible when it confirms their prior beliefs (Rabin, Schrag, 1999; Gentzkow and Shapiro, 2006)
- Media effects should be strongest when:
 - Home news tone is positive
 - Foreign news tone is negative
- Subsample analysis

Cross-listed stocks: Confirmatory bias

[illegible]

Distracted investors

- **Sports as a distraction** (Peress and Schmidt, 2018):
 - Sports attract tremendous attention / largely exogenous to company specific news / attention to sports varies across countries
 - Sports likely to distract those that are most susceptible to media slant
- Daily **Google searches** on major sports:
 - [US](#): “football”, “baseball”, “basketball”, and “hockey”
 - [Germany](#): “fussball”, “fußball”, and “basketball”
 - Aggregate / demean / de-trend per country
- Subsamples with high attention to sports:
 - Google searches above 90th/95th percentile

Cross-listed stocks: Distracted investors

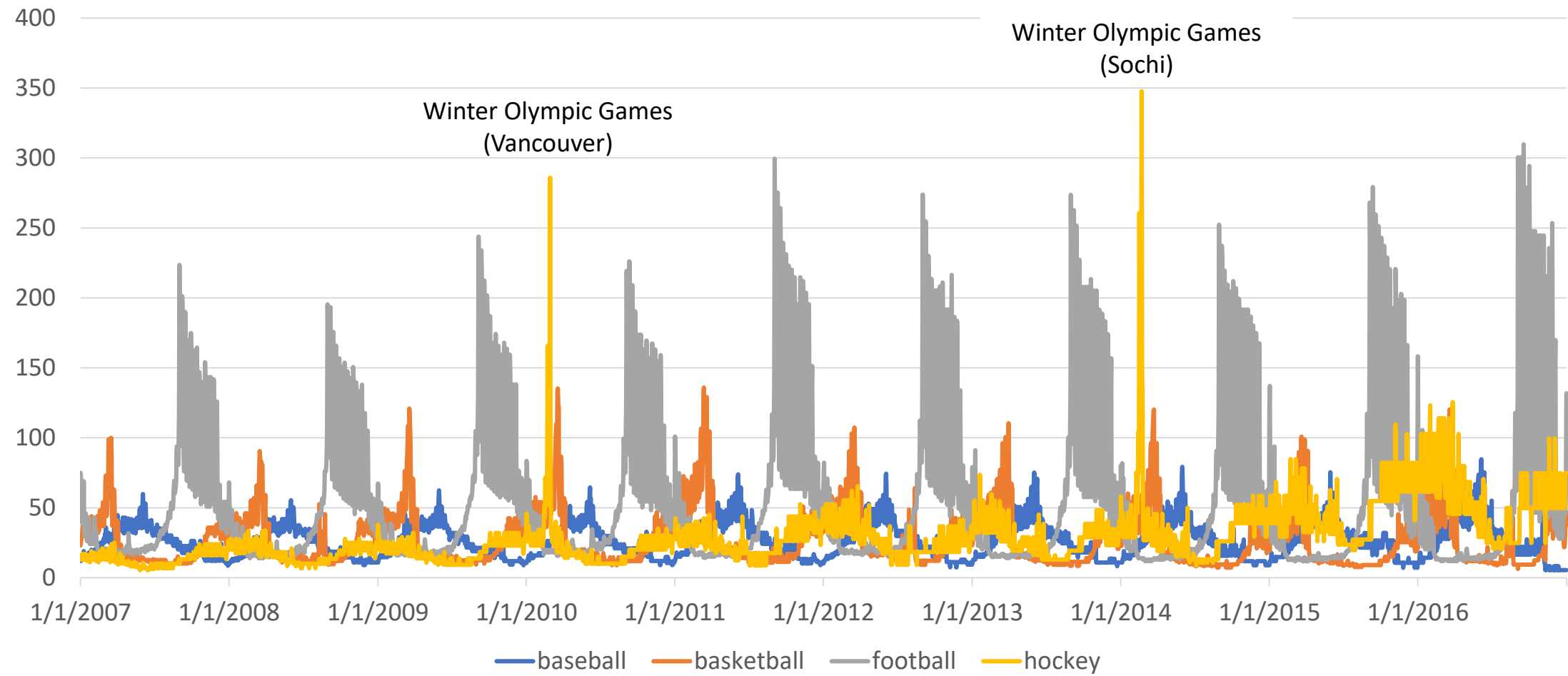
	[1]	[2]	[3]	[4]	[5]	[6]
	News reported at least			News reported in		
	in one country			home and foreign country		
	All	SSA > p90	SSA > p95	All	SSA > p90	SSA > p95
Home news tone - foreign news tone	0.16	0.12	0.07	0.14	0.06	0.01
t-stat.	(3.58)	(1.10)	(0.51)	(2.41)	(0.48)	(0.04)
Rel. stock price diff. (t-1)	0.06	0.08	0.03	0.02	0.07	0.02
t-stat.	(2.97)	(1.67)	(0.53)	(0.68)	(1.32)	(0.27)
Rel. stock price diff.(t-2:t-6)	0.16	0.16	0.16	0.19	0.12	0.14
t-stat.	(3.88)	(1.72)	(1.95)	(3.29)	(1.22)	(1.25)
Log(Visibility home news)	-0.04	-0.09	-0.21	-0.06	-0.10	-0.22
t-stat.	(-1.20)	(-1.28)	(-2.14)	(-0.92)	(-0.68)	(-1.18)
Log(Visibility foreign news)	-0.02	-0.04	0.01	-0.06	-0.23	-0.26
t-stat.	(-1.28)	(-1.43)	(0.38)	(-1.08)	(-1.88)	(-1.72)
N	10,048	1,946	1,024	5,587	1,035	553
R2	0.02	0.02	0.02	0.01	0.02	0.02

Conclusions & Implications

- Systematic evidence for home-country media slant:
 - Large-scale hand-coded news data for major car companies across three countries
 - Cross-section of domestic newspapers / international editions of *The Wall Street Journal*
- Evidence is consistent with the notion of media catering to domestic readers.
- Home-country media slant reflects/affects investor beliefs.
- Further implications:
 - Home-country bias (overinvestment in home countries)
 - Watchdog role of home media

Thank you!

Google searches: United States



Google searches: Germany

