Home-country media slant and equity prices*

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Abstract

We study national newspaper reporting and investor beliefs across the U.S., Germany, and Japan. Using comprehensive hand-coded media data for the automotive industry, we show that news about companies is systematically more positive in companies' home countries than abroad. Home-country media slant increases during bad times for companies, and it correlates strongly with equity prices. Cross-country difference in news tone predicts temporary price deviations of cross-listed stocks. Abnormally high home-media news tone predicts low monthly domestic stock returns. The effects are strongest for confirmatory news and weakest when home-biased investors are likely distracted by sporting events.

Keywords: media slant, media bias, textual analysis, investor sentiment, cross-listed stocks, confirmatory bias

JEL Classification: L82, D23, F23

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1 Introduction

National newspapers are considered the most credible sources of information among the printed media. In fact, if media consumers care only about the accuracy of media reporting, the strong competition for readership at the national level should ensure that reporting in national newspapers is balanced and impartial (Gentzkow and Shapiro, 2008). In view of this, national newspapers are often treated as largely unbiased and have been used as a yardstick to assess biases in more specialized local or financial media (Reuter and Zitzewitz, 2006; Gurun and Butler, 2012).

However, if media consumers have prior beliefs, and such beliefs differ from country to country, national newspapers have an incentive to slant the presentation of the news to the views and perceptions in their home countries (Mullainathan and Shleifer, 2005; Gentzkow and Shapiro 2006). Indeed, the *anecdotal* evidence suggests that national media spin reports on foreign affairs to the predominant political views in their home countries. Similarly, in reports on sporting events, we often observe disproportionately favorable depictions of home athletes.[1]

In this paper, we conjecture that cross-country media slant arises for business and corporate news, especially when news is about companies that can be viewed domestically as *"home teams,"* that is, companies in industries that compete at the international level and are important for a country's economic success. There is widespread evidence that, for economic reasons and a need for self-enhancement, people favor domestic brands over foreign brands, and consequently, trust more in the future performance of home companies (Shankaharmesh, 2006). Over optimism in domestic companies and patriotism have also been identified as important factors for the puzzling tendency of people to overinvest in home markets (Strong and Xu, 2003; Morse and Shive, 2011).

[1] For anecdotal evidence on foreign affairs, see Gentzkow and Shapiro (2006) and the references therein. For reports on international sporting events, see Bie and Billings (2015), among others.

To attract readers and to maximize profits, it may therefore be in newspapers' interests to spin the news toward the home bias in peoples' perceptions of companies.

Conversely, if national news is slanted toward beliefs in their home-countries, cross-country differences in the tone of news should *reflect* cross-country differences in investor beliefs (investor sentiment). Since most readers are exposed to only the domestic news (because of language barriers and the higher cost of accessing international coverage), the way national media filter news to domestic audiences can also have a particularly strong effect on *reinforcing* cross-country differences in investor beliefs.

We test for the presence of home-country media slant and analyze its relation to investor beliefs in the context of the automotive industry across the three major car-producing countries: the United States, Germany, and Japan. We chose the automotive industry for three reasons. First, the automotive industry played a prominent role in the economic development of these countries, and it is one of their most important industries. Through the widespread use of cars and the strong competition of automotive companies across countries, automotive brands have also evolved as being some of the most internationally known brands. Despite the fact that nowadays car companies produce and sell cars in many countries, their brands remain closely associated with the national and cultural identities of their companies' home countries. As such, the home bias in people's perceptions of companies in the automotive industry may be especially strong. Second, because car companies compete strongly at the international level, there is substantial and practically constant media coverage of automotive companies across many countries. This enables us to compare news about the same companies simultaneously in all the countries analyzed. Last but not least, many car companies are traded on stock markets across the countries. When testing how media slant interacts with investor beliefs, we are not restricted to only one price per company

in domestic stock markets. We can also relate differences in media reporting across countries to temporary stock price deviations of cross-listed stocks. This alleviates concern that the posited media effects are driven by differences in company characteristics.

To ensure sufficient media coverage for all companies in all the countries analyzed, we focus on the three largest auto manufacturers in each country, commonly referred to as the country's Big Three. In the United States, the Big Three are General Motors, Ford, and Chrysler.[2] Germany's Big Three are Volkswagen AG, Daimler AG, and BMW. Japan's Big Three are Toyota, Nissan, and Honda. All companies have substantial presence in all the analyzed countries; together they account for nearly 70% of global automotive production.

We compare news for these companies and their brands in national newspapers in all three countries over the past decade.[3] We obtain a novel media data from a leading company in the field of media analysis for the automotive industry, PRIME Research Ltd. (henceforth PR). The main challenge in cross-country news comparisons stem from the fact that news is reported in national languages and subject to cultural differences (Kloumann et al., 2012; Dodds et al., 2015). PR addresses this challenge by employing native speakers who read and assign *tone* to news published in their native language. All coders undergo rigorous training, and their performance is constantly monitored. The unit of observation is a *segment* of a news article, i.e., a title, paragraph, or self-contained message. For all segments that contain value judgments, coders assign news tone on a discrete nine-point scale from −4 (most negative) to +4 (most positive).[4] Besides the tone, which is our main variable of interest, the data include general information about each news item as well as many other variables that allow us to explore the mechanics of media slant.

[2] We consider Chrysler as an American company until 2014, when it was acquired by Fiat (an Italian car producer).
[3] A newspapers is classified as a national newspaper if it is circulated nationwide.
[4] In the regression analysis, we include a set of fixed effects to control for any remaining systematic differences between the news tone across the countries and the coders.

For our sample of 9 car companies (and 35 associated car brands) during the 2007–2016 period, we have a total of 773,303 news segments (observations) that appeared in 188,118 articles published in a total of 186 national newspapers: 86 from the United States, 85 from Germany, and 15 from Japan. News is reported in each country's local language.

We find widespread evidence for home-country media slant; that is, we find that news about companies has a systematically more positive tone in companies' domestic newspapers than in foreign newspapers. In particular, for each of the nine companies in our sample, the unconditional average news tone is more positive in a company's home country. After we control for fixed effects (country, country of origin, company × year-month, media, and coder fixed effects) and for several other news-specific control variables, the estimated coefficient on a "home" indicator variable (*home dummy*) is 0.28 and highly significant (*t*-statistic of 9.31). This effect is considerable, given that the scale for news tone ranges from –4 to plus +4. Results hold for a subsample of the three most important (highest-visibility) national newspapers per country and for the addition of journalist-fixed effects. Results also hold for each of the three country pairs.

Moreover, the difference in the tone of news is virtually the same in a subsample consisting of news about the same general topic of news for the same time dimension (past, present, or future event) and published in the same week in all three countries. This confirms that the documented home-country media slant is not merely an artifact of a selective coverage of events; instead, it reflects a more positive article spin in home newspapers than in foreign newspapers. As Gentzkow and Shapiro (2006) predict, we also find that media slant is stronger for news that is more difficult to verify—topics such as employee relations, ecology, and corporate social responsibility—especially when the news refers to a future event rather than a past event.

Furthermore, the demand-based model for media slant of Mullainathan and Shleifer (2005) applied to our cross-country setting predicts that home-country media slant increases during bad times for companies. Indeed, we find that media slant increases substantially during major car scandals (e.g., Volkswagen's scheme to defeat diesel emissions testing, Toyota's self-accelerating car debacle) and on announcement days of car recalls. We also find a significantly higher home-country media slant during times of low company market valuations (low market-to-book ratios).

Finally, we show that the home-country media slant is also present in the international editions of a given media outlet. In particular, we find similar evidence when we compare news about American and German companies in the US and European editions of the *Wall Street Journal*.

The fact that we find evidence for a home-country media slant not only across national newspapers in different countries, but also in the international editions of the *Wall Street Journal*, where news is often written by the same journalists and published in the same language, provides a strong support for the news catering hypothesis. The news-catering hypothesis is also consistent with the fact that, in each of the countries analyzed, several newspapers compete for an audience at the national level. As Gentzkow and Shapiro (2008) argue, media slant is more likely to persist in the face of competition when readers themselves prefer biased news because news providers would forgo their own views in order to survive in the long run. In additions, competition in the market for news mitigates the extent to which newspapers can curry favors with companies that advertise in newspapers. Using monthly country by country brand-level car sales as a proxy for advertising expenditures, we confirm the results of Gurun and Butler (2012), and find that, unlike for local newspapers, our estimates of media slant in national newspapers remain unchanged when we control for lagged sales. Finally, if media slant were driven by *cozy* relations between newspapers and companies, we would expect media slant to increase during bad times for

companies when prices are most sensitive to news (Dyck and Zingales, 2003a; 2003b). Instead, we find that home-country media slant increases in times of low market valuations, as predicted by the demand-based model for media slant.

Having established the existence of home-country media slant, we next study its relation to investor beliefs (Tetlock, 2015). Our evidence suggests that home-country media slant arises because national newspapers cater the presentation of the news toward people's perceptions of companies. If so, then cross-country differences in news tone should also *reflect* cross-country differences in investor beliefs. We test this proposition by relating home-country media tone to equity prices.

We start with the analysis of domestic stock markets. In our sample, home investors hold most of the companies' equity. Abnormally high home-media news tone should therefore signal that home investor sentiment is overly high, which in turn should lead to low domestic stock returns going forward. To test this prediction, we set up a long–short portfolio strategy, which we refer to as *"betting against the home media."* If, for a given company in a given month, the difference between the home and foreign news tone is positive and higher than the cross-sectional median for this difference, we include its stock in the next month's short portfolio; otherwise, we include it in the next month's long portfolio. We find that this strategy would have yielded, over the past ten years, abnormal monthly returns in excess of 1.4%.

Next, we exploit the *simultaneous* trading of American and German car companies on the stock markets in both countries. Because equity holders of the same stock in different countries are entitled to the same cash flows, time-matched stock price deviations across countries cannot be driven by differences in stock characteristics. Such deviations may occur, however, if there exist

cross-country differences in investor beliefs. We find that the daily difference in the tone of news between the countries indeed predicts temporary stock price deviations between the countries.

Both results provide strong support for our hypothesis that media tone *reflects* cross-country differences in investor beliefs. By catering to home audiences, national newspapers can also *reinforce* investor existing beliefs (Tetlock, 2015). To test for a causal effect of media on investor beliefs, we would ideally require a shock to dissemination of news (Engelberg and Parsons, 2011). In our period, such shocks are difficult to identify because newspapers can be accessed online. We therefore devise two alternative tests.

In the first test, we build on the theory of confirmatory bias (Rabin and Schrag, 1999). Specifically, individuals tend to act on information that confirms their prior beliefs and incline to ignore evidence that is inconsistent with their beliefs. This implies that the predictive coefficient relating differences in media tone to cross-country stock price deviations should be highest on days with confirmatory news, that is, on days with positive news about home companies and negative news about foreign companies. Indeed, as we focus on a subsample of such news, the predictive coefficient on the news tones almost triples. This suggests that, by catering the news to domestic audiences, newspapers can reinforce investors' beliefs.

In the second test, we exploit shocks to investor attention to news. Not all investors may hold biased beliefs and neither do all investors pay attention to news at all times. We thus expect the relation between the news tones and price deviations of cross-listed stocks to weaken on days when home-biased investors are distracted. Peress and Schmidt (2018) show that attention-grabbing public events distract behavioral investors. Following their argument, we use attention to sports as a measure of distraction for biased investors in our setting. Based on country-specific Google search activity on major sports, we find that the predictive relation is indeed weakest on days with

highest attention to sports. This is consistent with the conjecture that media reinforces beliefs of home-biased investors only when these investors pay attention to news.

We contribute to the literature on the measurement, determinants, and impact of bias in the market for corporate and financial news (Dyck and Zingales, 2003a,b; Reuter and Zitzewitz, 2006; Engelberg and Parsons, 2011; Gurun and Butler, 2012; Garcia, 2018). While existing literature focuses on media bias within the U.S., we analyze media slant across the countries, and provide first systematic documentation of media slant at the international level.[5]

Conceptually, most closely related works are Reuter and Zitzewitz (2006) and Gurun and Butler (2012). Reuter and Zitzewitz (2006) show that personal finance publications are biased when compared to national newspapers. Gurun and Butler (2012) show that local newspapers use less negative words than national newspapers when reporting on local companies. In comparison, we show that national newspapers are also biased, but such bias becomes apparent in cross-country comparisons.

While media slant in financial and local news has been largely attributed to the advertising effects and quid pro quo relations (Dyck and Zingales, 2003b; Reuter and Zitzewitz, 2006; Gurun and Butler, 2012), our evidence suggests that home-country media slant is most consistent with the news catering hypothesis (Gentzkow and Shapiro, 2010). Whereas the effect of local media slant on market valuations is strongest for smaller and less visible stocks (Gurun and Butler 2012), we find that cross-country media slant matters for large corporations.

[5] In existing studies, cross-country comparisons of media reporting are mostly anecdotal. For example, Sack and Suster (2000) offer an account of Croatian, Serbian, and international media coverage of two politically charged soccer matches that Croatia played at the brink of Yugoslavia's dissolution. Gentzkow and Shapiro (2006) give an example of *Al Jazeera English*, *Fox News*, and the *New York Times* conveying radically different descriptions of the 2003 American intervention in the Iraqi city of Samara. Bie and Billings (2015) show that US and Chinese media reported very different coverage of the doping suspicions surrounding Chinese swimmer Ye Shiwen in the 2012 Olympic Games.

Engelberg and Parsons (2011) and Peress (2014) establish a causal effect of local media coverage on local trading volume and stock return volatility. We disentangle news tone from media coverage, and provide evidence consistent with media tone having an impact on equity prices. An important advantage of our empirical setting is that stocks are cross-listed; therefore, we can rule out the possibility that our results are due to the confounding effects of company characteristics.

We also advance the *measurement* of media slant. Instead of inferring news tone from an automated count of a predetermined set of negative or positive words (as in, e.g., Tetlock, Saar-Tsechansky, and Macskassy, 2008; Loughran and McDonald, 2011; Gurun and Butler, 2012), we use the *tone* of media reports as perceived by native speakers. This enables us to compare media reporting across the different languages, and it has the added advantage of capturing non-salient features of news reports that are difficult to capture using standard textual analysis (Loughran and McDonald, 2016).

More broadly, our study has implications for the role of the media in providing external governance (Dyck, Morse, and Zingales, 2010). Our results suggest that catering to home-country media consumers may incentivize media to conceal bad news about home companies. In fact, it suggests that foreign media are more likely to play a watchdog role than home-country media (Dyck, Volchkova, and Zingales, 2008). The documented media slant may also help us understand the puzzling tendency of investors to invest disproportionally in home-country companies. While Van Nieuwerburgh and Veldkamp (2009) emphasize that investors may have more value-relevant information about domestic companies, and Strong and Xu (2003) show that investors are more optimistic about home equity markets, our evidence suggests that national media can reinforce investor optimism in domestic companies.

The rest of the paper proceeds as follows. In Section 2, we describe the data. In Section 3, we present the summary statistics and provide preliminary evidence for home-country media slant. In Section 4, we formally test for home-country media slant. In Section 5, we analyze how media slant interacts with media coverage, and how it varies over time and across different types of news. We also extend the evidence on home-country media slant to international editions of the *Wall Street Journal*. In Section 6, we discuss other factors that may contribute to home-country media slant. In Section 7, we show that home-country media slant predicts domestic stock returns and stock price deviations of cross-listed stocks. In Section 8, we provide concluding remarks.

2 Data

We obtain news data from Prime Research (PR). PR is a leading global provider of media monitoring and analysis for international companies and institutions. The company has been in business since 1987 and employs over 1,000 data analysts in eight research centers in Europe, North America, and Asia. It constantly monitors news reports about its clients in media outlets across countries and languages.

Languages differ in their cultural imprint and the overall positivity (Kloumann et al., 2012; Dodds et al., 2015). To account for the inherent differences between the languages, the PR standard approach is for native speakers to manually code all news. All coders are PR employees and they all undergo rigorous training to ensure consistency and comparability of the coding procedures and outcomes across media outlets and languages. As PR states in the introduction of its internal training manual: "The quality and the precision of the coding are the *sine qua non* of all our work." Coders' performance is constantly monitored using double blind probes. Recently, PR introduced partially automated coding of news, to serve as an additional monitoring tool for coders, and for

coding of less important media outlets. In the regression analysis, we will also use country fixed effects to control for any remaining differences between the tones of news reported in different languages.

While PR monitors both traditional and social media for different industries, it started out with analysis of traditional media outlets for the automotive industry, and this remains its main area of specialization. We obtained the raw PR news data for the automotive industry for the period from January 2007 through December 2016.

The data cover news about auto companies in each country's most important newspapers. The data are coded at three levels: at the level of a newspaper, at the level of an article, and at the level of a segment of an article. A segment is a part of an article with a self-contained message (e.g., a title, paragraph, or part of a paragraph). It is uniquely defined by a mention of a particular car brand, the general topic of a segment's news, references to outside experts, and the time dimension of the described event (e.g. a past, present, or future event).

News tone is assigned to all segments that contain value judgments. Tone is evaluated on a 9-point scale from −4 (most negative depiction) to +4 (most positive depiction), where 0 stands for a neutral tone.

For all core newspapers, coders are exclusively native speakers. For less important newspapers, coding in recent years is partially automated (native speakers code the title and the lead paragraph, and automated coding is used for subsequent paragraphs). For identical articles, coding is repeated.

The news tone is our primary variable of interest, but the data provide considerable additional information. At the newspaper level, there is the newspaper's name and date of publication, country of publication, and whether it is a national or a regional edition. At the article level, we have information on the lead journalist (or, if the article is written by the editorial board); we also

know whether the article includes a photo, the name of the PR employee who coded the article, and the number of segments in a given article. At the segment level, we have information on a segment's visibility, whether the segment focuses on the product (the car) or the company, the name of the company, the name of the car brand, the general topic of news, whether the segment refers to experts, financial institutions, or public entities, and whether the reported news is about a past, present, or future event. A segment's *visibility* is based on the newspaper's overall circulation, the article's location within the newspaper, and the number of segments in an article.

We are interested in media reports about car companies, and we therefore focus on news about different aspects of companies. There are eight general topics for news about car companies: company structure, market position, product strategy, corporate strategy, financial performance, management, employee relations, and corporate social responsibility and ecology.

To ensure substantial and constant media coverage for all companies in all the countries analyzed, we focus on news about the Big Three car manufacturers in each of three largest car-producing countries. In the United States, the Big Three are General Motors (GM), Ford, and Chrysler. In Germany, they are Volkswagen AG (VW), Daimler AG, and BMW. In Japan, the Big Three are Toyota, Nissan, and Honda.

These car companies produce and sell cars under several brand names. In our data, we can aggregate news by car company group or by any of the associated brands. Some companies in our sample also own brands that produce automotive parts, motorcycles, buses, large trucks, and so forth. Since our focus is on the car industry, we exclude any brand that is not associated directly with car production. We also exclude any "acquired" car brands where the acquirer does not have

majority ownership for at least half of our sample period.[6] These brands receive relatively little media attention, and their exclusion has no material effect on our results.

The final sample consists of 9 car companies and 35 associated car brands (Table A.1 in the Internet Appendix provides the details). Except for four, these brands exist throughout the whole sample period.[7] We exclude Chrysler brands from January 2014 onward, when the company was acquired by Fiat (an Italian car producer). The name of the company group usually matches the name of the main brand. The only exception is General Motors: in Table A.1, "GM*" refers to news about the GM group that is not specific to any of its brands.

PR constantly analyzes a number of core newspapers. Its clients may occasionally request analysis of additional media outlets. In our sample, we observe two months in Germany and three months in the United States when the number of analyzed newspapers more than doubled. In extraordinary circumstances, PR may also reduce the scope of its analysis. In our sample, this occurred in Japan between April 2010 and September 2011, when car companies temporarily reduced budgets following the global financial crisis. Although PR continued to monitor its core Japanese newspapers, it reduced the breadth of its analysis during that period.

We focus on the core newspapers by requiring that a particular newspaper be in the data set for at least 12 non-consecutive months. This filter does not materially affect our results. The number of distinct newspapers per month varies with an average of 49 for the US, 48 for Germany, and 10 for Japan.

We conduct the analysis at the highest level of granularity—that is, at the level of a *segment* of an article. We omit segments to which no tone is assigned. Because our focus is on national

[6] For example, Ford partially or fully owned Jaguar (until 2008), Land Rover (until 2008), and Volvo (until 2010).
[7] The discontinued brands are Hummer, Pontiac, Saturn, and Mercury.

newspapers, we only retain news reported in newspapers' *national* editions. Newspapers' national editions or simply national newspapers are defined as newspapers with a countrywide circulation.[8] In total, our data consist of 773,303 news segments appearing in 188,118 articles. These articles were published in 186 newspapers; 86 newspapers are from the United States, 85 from Germany, and 15 from Japan.

Lead journalist is identified for 103,079 articles (7,437 different journalists). No lead journalist is identified for 85,039 articles, of which 365 were written by a newspaper's editorial board. At least one photo is included in 73,260 articles; 3,576 articles reference an expert, 1,916 a financial institution, and 4,852 a public entity. The data are coded by 379 Prime Research employees. Most of the articles (i.e., 162,331 of them) are fully human coded by native speakers, and coding for 25,474 articles is partially automated; for 313 identical articles, coding is duplicated.

For the analysis of the international editions of the *Wall Street Journal* (*WSJ*), we also obtain from Prime Research the news data for the *WSJ* European edition. These data are coded in the same way as the main data, with the only difference being our *WSJ* data run from January 2007 through April 2016 rather than December 2016. Across both editions of the *WSJ*, we have 43,126 news segments for which tone is assigned: 27,009 segments for the US edition plus 16,117 segments for the European edition.

In addition to media data, we obtain monthly sales data for cars and light trucks by country and by car brand from *Ward's Automotive Yearbook*. For each brand and country, we match monthly sales of cars and light trucks with our news data. For news about General Motors that is not specific to any of its brands ("GM*" in Table A.1), we use total sales for all the GM brands.

[8] News reported in regional editions account for only 3% of all observations, and eliminating them has no material effect on our results. In fact, in Section 6.2, we document that media slant appears to be greater in regional newspapers than in national newspapers.

For the United States, we also obtain data on newspaper advertising expenditures and announcements of car recalls. The advertising data come from Kantar TNS and include monthly figures for advertising expenditures for each car brand in our sample across approximately 200 US newspapers. The data on announcements of car recalls are from the Office of Defects Investigation's website.[9] The data cover all automotive recalls in the United States for all cars produced by the companies in our sample. Recalls are either ordered by the National Highway Traffic Safety Administration or initiated voluntarily by the car companies. For each recall, we use the day the record was created (DATEA) and aggregate the number of affected cars by car brand. In total, we have 641 recall records at the brand level.

The data for domestic stock markets (adjusted stock price, market-to-book value, and market capitalization) come from Thomson Reuters Datastream. The data are based on information from the New York Stock Exchange for American companies, the Deutsche Boerse for German companies, and the Tokyo Stock Exchange for Japanese companies. All data are converted to U.S. dollars. There are no stock market data for Chrysler, which was privately owned before it was acquired by Fiat. We are also missing data for General Motors prior to 2010, when the company made an initial public offering upon emerging from bankruptcy.

For analysis of cross-listed stocks, we obtain daily opening and closing currency-adjusted stock prices for American Depositary Receipts (ADRs) and cross-listed stocks from Thomson Reuters Datastream. The intra-daily data for domestic markets are from TickData trading records; the time-stamped prices refer to the closing prices based on half-hour intervals of trading data. To match both data sets, we rely on actual prices, which are not adjusted for dividends, splits, or other companies' actions (the "unadjusted" series in Datastream). Finally, to analyze whether the

[9] https://www-odi.nhtsa.dot.gov/downloads/.

relation between media reporting and cross-listed stock prices varies with investor attention, we download (from Google Trends) daily searches on major sports across countries.

3 Home-country media slant: Summary statistics

Table 1 presents the summary statistics for news tone and visibility for each of the nine car companies in our sample. Panel A reports the statistics for all media in the three countries: the United States, Germany, and Japan. Panels B and C report the same statistics separately for home and foreign media. The period runs from January 2007 through December 2016.

All companies have a high level of media exposure throughout our sample period. In cumulative terms across all the newspapers in all three countries (number of observations multiplied by average visibility), news about each company reached at least 525 million readers (for BMW) and as many as 3.76 billion readers (for GM). Visibility is, on average, 2.62 times higher in home media than in foreign media. Even Nissan, which has the lowest visibility in foreign media, had an overall cumulative exposure to some 165 million foreign readers.

Average news tone ranges from 0.07 for GM to 1.11 for BMW. The news tone is generally high for German car companies and relatively low for American car companies; Japanese car producers stand in the middle. This is unsurprising because American car companies all experienced immense financial troubles at the beginning of our sample until the US government initiated a large-scale rescue plan in 2009. Among German and Japanese producers, VW and Toyota have the least positive tone. In part, this is due to the VW emissions scandal in 2015 and to Toyota's problems with self-accelerating cars in 2009–2010.

Most important, the average news tone for each car company is more positive in home media (Panel B) than in foreign media (Panel C). The difference ranges from 0.07 for Nissan to 0.94 for

Volkswagen. The cross-sectional average for this difference is 0.43, which is substantial, given that the score for tone is bounded at minus and plus four. We interpret these results as a first indication for the presence of a home-country media slant.

4 Home-country media slant: Main results

To formally test for the difference in news tone between home and foreign newspapers, we run a pooled panel regression of news tone on a home dummy:

$$Tone_{t,i,c} = \alpha + \beta Home\ dummy_{t,i,c} + \delta FE_{t,i,c} + \lambda Controls_{t,i,c} + \varepsilon_{t,i,c}. \quad (1)$$

The variable *Tone* is measured on day *t* for car brand *i* in country *c*. The *Home dummy* indicator takes a value of one for tone measured in the country of a car brand's ultimate owner (i.e., the car company's home country) and zero otherwise.

We include several fixed effects (the intercept is included only in a regression without fixed effects). Country fixed effects capture any differences in the level of tone among the countries. Country-of-origin fixed effects control for the possibility that companies in different countries are perceived differently. Company and year-month fixed effects control for any unobservable variation across companies and time. Because we are interested in the difference in tone when news about a particular company is published in home and foreign newspapers at the same time, we include "cross fixed" effects—that is, company × year-month interactions. Newspaper fixed effects capture the idea that newspapers may differ in terms of the coverage and slanting of home and foreign companies. Coder fixed effects control for variation in tone assigned by different Prime Research employees. Similarly, journalist fixed effects control for variation in tone on the part of news writers.

We also include message-specific controls: each segment's visibility, a dummy variable for articles that include a photo, a dummy variable for articles written by an unknown journalist, a dummy variable for articles written by the editorial board, and three dummies for segments that reference experts, financial institutions, and public entities. In addition, we control for the number of newspapers (i.e., the monthly number of newspapers in our data for each country). To account for any correlation of tone across companies, we adopt the standard approach of calculating standard errors clustered by company. Our results are robust to calculating standard errors clustered by year-month or by newspaper. In fact, clustering by company leads to lower *t*-statistics than does clustering by the two alternatives.

The regression results are reported in Table 2. We start with a regression in which home dummy is the only explanatory variable. We then gradually add fixed effects and other control variables. In the univariate regression, the estimated coefficient on a home dummy is 0.58 with a *t*-statistic of 6.56 (column 1). When we include all fixed effects (columns 2–5), the estimated coefficient on a home dummy drops to 0.28 and the *t*-statistic increases to 9.17. Among fixed effects, the company × year-month fixed effects have the greatest impact. Coder and newspaper fixed effects also matter, although less so.

We add message-specific controls in column 6. The dummy variable for a photo is positive and highly significant, which suggests that newspapers often use photos when reporting positive news. Visibility and references to experts, financial institutions, and public entities enter with a negative sign. The overall effect of these control variables on the home dummy is negligible, however. Similarly, the number of newspapers is marginally significant and has no effect on the home dummy.

Next, we repeat our analysis using only the three most important newspapers in each country. These are newspapers with the highest visibility as of the end of 2016: the *New York Times*, *USA Today*, and the *Wall Street Journal* in the United States; *Bild*, *Westdeutsche Allgemeine Zeitung*, and *Sueddeutsche Zeitung* in Germany; and *Yomiuri simbun*, *Asahi simbun*, and *Mainichi simbun* in Japan. The results are presented in columns 7 and 8. Despite the substantially reduced sample, the estimated coefficient on a home dummy is virtually the same. The reduced sample allows us to additionally control for journalist fixed effects. This reduces the coefficient on a home dummy from 0.27 to 0.24, athough the *t*-statistic remains high at 10.85.

Finally, columns 9–11 present results for subsamples of US–Germany, US–Japan, and Germany–Japan country pairs. The coefficient on a home dummy is always positive and significant, but it varies considerably across the country pairs. The coefficient is the highest (0.46) when comparing news in the United States and Japan and is the lowest (0.09) when comparing news in Germany and Japan. The coefficient for the US–Germany country pair is between those values and approximately the same as its value in the main regression (0.27).

5 Home-country media slant: Additional results

Our main results provide evidence that news about companies is systematically more positive in home newspapers than in foreign newspaper. Next, we analyze how this home-country media slant interacts with selective media coverage and how it varies over time and across different types of news. In addition, we extend the evidence on home-country media slant to international editions of the *Wall Street Journal*.

5.1Same or different news

Home-country media slant can arise when home and foreign newspapers are reporting on the same events, but the home media present events with a more positive spin. Alternatively, media slant could arise because of selective coverage; for example, newspapers could avoid reporting bad news about home companies.

By controlling for company and year-month cross-fixed effects in Table 2, we focused on differences in news about the same company within the same month. To probe further, we look at subsamples. First, we retain only those observations that report news about the same car brand in all three countries in the same week. Next, we exploit that, for a vast majority of observations, we have information about the news topic: company structure, market position, product strategy, corporate strategy, financial performance, management, employee relations, and corporate social responsibility and ecology. We additionally require that reported news be about the same general topic. Finally, we know whether news is about a past, present, or future event; thus, we impose even more stringent criteria and require that the news refer to the same time dimension.

Results are reported in columns 1–4 in Table 3. In column 1, we establish that the main results are similar to the baseline case when we restrict the sample to observations where we have information about a news story's general topic and time dimension. In columns 2–4, we report results for the subsamples described above. As we add restrictions on the type of news that is reported within the same week in all three countries, the number of observations drops substantially, but the coefficient on a home dummy barely changes; it remains strongly significant at approximately 0.30. These results provide further support that home media presents news with a more positive article spin than foreign media.

5.2News verifiability

We would expect less of a media slant for news that is easier to verify. Gentzkow and Shapiro (2006) model this relation explicitly. If readers are opposed to extreme slanting, and newspapers care about their reputation, media slant declines with readers' ability to learn the facts from other sources.

We test this prediction in two dimensions. First, we use information about the general topic of news. We categorize news into three groups depending on how difficult it is to verify it. Formally, we define three dummy variables. *Low* takes a value of one for news about company structure and market position. This is news that is presumably easiest to verify, and where we expect media slant to be the lowest. *High* takes a value of one for news about employee relations and corporate social responsibility and ecology. This is news that is presumably most difficult to verify, and where we expect media slant to be the highest. For the remainder of the news topics, we define a dummy variable as *Medium*, which takes a value of one for news about product strategy, corporate strategy, financial performance, and management.

Second, we identify whether news refers to a past, present, or future event. News about the past event is presumably easy to verify, especially if it is about past market position. News about future market position is, of course, not immediately verifiable. For topics such as corporate social responsibility and ecology, news may be difficult to verify even if it refers to a past event. We therefore expect both dimensions, topic and timing, to play a role as to the extent of media slant. As we did for topics, we form three dummy variables to indicate whether news is about a *Past*, *Present*, or *Future* event. Together, we have nine possible combinations for type of news, three along each dimension.

Results are reported in column 5 in Table 3. We focus on the interaction terms between the home dummy and the different types of news. The estimated coefficients are in line with our predictions. The coefficient is low at 0.05 and insignificant with a *t*-statistic of 0.45 for news that is easiest to verify (news categorized as *Low* and *Past*). Coefficients increase along the topic and time dimensions. The highest coefficient is 0.63 with a *t*-statistic of 7.46 for news that is most difficult to verify (news categorized as *High* and *Future*). The difference between these two coefficients is statistically significant with a *t*-statistic of 3.51.

5.3Good and bad times for companies

If national newspapers cater the presentation of the news to domestic media consumers, we expect home-country media slant to increase during bad times for companies. We present the intuition in a demand-based model for media slant of Mullainathan and Shleifer (2005) applied to our cross-country setting (see Internet Appendix B for formal exposition).

To capture the idea of a home bias in people's perceptions of companies, we assume that home media consumers hold higher priors about a company than foreign media consumers. Since people tend to be more attached to home companies than to foreign companies, we also assume that readers derive greater utility from confirmatory news on a home company than from confirmatory news on a foreign company. In other words, media consumers derive more utility from good news on home companies than from bad news on foreign companies. This is similar in sports, where sports fans presumably get more utility from victories of their own team than from the defeats of their rival teams.

Under these assumptions, in perfectly segmented home and foreign market for news, the home-country media slant (= home media news tone minus foreign media news tone) is always positive: home newspapers tend to report overly positive news during bad times for companies and foreign

newspapers have an incentive to report overly negative news during good times for companies. Because media consumers prefer good news on home companies to bad news on foreign companies, home newspapers slant the news during bad times more than foreign newspapers slant the news during good times. As a result, the overall home-country media slant increases during bad times for companies.

We test this prediction using different proxies for good and bad times for companies. First, we examine media slant around major car scandals and on announcements days of car recalls. To define good and bad times more generally, we also analyze how media slant varies with companies' market valuations. Results are reported in Tables 4 and 5.

5.3.1 Major car scandals and car recalls

Volkswagen "Dieselgate" is the biggest auto scandal during our sample period. It started on 18 September 2015, when the US Environmental Protection Agency issued a notice of violation, alleging that Volkswagen Group had installed programming devices on diesel engines to pass laboratory emissions tests. In the days following this news, the VW stock price lost nearly a third of its value. A number of countries opened regulatory investigations, and more than 11 million cars were recalled in the subsequent months.

To capture the effect of Dieselgate, we define a dummy variable *VW scandal* that takes a value of one for all news about Volkswagen Group published between 18 September 2015 and 31 December 2015. As reported in Table 4, the estimated coefficient on *VW scandal* is negative at –2.88, while the coefficient on *Home dummy* × *VW scandal* is positive at 0.58. Both coefficients are highly significant. While the media overall were very critical of the VW misconduct, the home media were far less critical than the foreign media. As a result, home-country media slant increased by more than half a point.

The second major car company crisis in our sample is Toyota's issue with sudden unintended acceleration of its cars. The issue started in the aftermath of a two-car collision killing four people on 28 August 2009. Following further investigation, Toyota recalled as many as 9 million cars by the end of January 2010, with a temporary suspension of production and sales of some of its most popular vehicles. We define a dummy variable *Toyota crisis* that takes a value of one for all news about Toyota Group between 28 August 2009 and 31 January 2010. Similar to the case of the VW scandal, the estimated coefficient on *Toyota crisis* is negative at −1.21 and its interaction with *Home dummy* is positive at 0.46. Again, both coefficients are significant.

Finally, we look at all automobile recalls that took place in the United States over our sample period. We focus on the announcement dates of recalls. Dummy variable *Recall* takes a value of one on the recall announcement day for car brands affected by the recall. To capture the severity of recalls, we impose criteria on the number of cars affected. The estimated coefficient on *Recall* is always negative, and the interaction term *Home dummy* × *Recall* is always positive. The coefficient on the interaction term increases from 0.29 for recalls that affected at least 5,000 cars to 0.88 for recalls that affected at least half a million cars.

5.3.2 Market valuations

A more general signal of how well a company is doing is revealed in its market value. A high ratio of market to book value can be interpreted as good times for the company, while a low ratio would signal bad times. We define *MB low* as a dummy variable that takes a value of one when the company's market-to-book ratio is below *a*, and we define *MB high* as one when the company's market-to-book ratio is above *b*. *MB medium* takes a value of one when the market-to-book ratio is between *a* and *b*. The choice of parameters *a* and *b* is arbitrary. In theory, market-to-book ratio should range around one. To guarantee a sufficient number of observations associated with each

dummy, we consider three different values for each parameter. We set *a* to either 0.5, 0.6, or 0.7, and we set *b* to either 1.5, 1.4, or 1.3.

The regression results are reported in Table 5. We first establish that our main results remain strong and significant when we restrict the sample to companies for which we have stock market data (column 1). The coefficient on a home dummy is 0.26, and it is significant with a *t*-statistic of 10.87. The coefficient on a home dummy remains unchanged when we include additional control variables: the market-to-book ratio, the market value, and monthly returns (approximated by returns over the past 21 trading days) lagged by one day (column 2).

Next, we add dummy variables based on the market-to-book ratios and their interactions with a home dummy. The estimated coefficient on *MB low* is negative and the coefficient on *MB high* is positive but not always significant. Most important, the estimated coefficients on the interactions between the *MB* indicators and the home dummy are positive and exhibit considerable variation. While the coefficient on the *MB low* × *Home dummy* is always high, between 0.51 and 0.55, and significant, the coefficients on the *MB medium* × *Home dummy* and *MB high* × *Home dummy* are much lower, between 0.09 and 0.21, and not always significant. Furthermore, the difference between the coefficients on *MB low* × *Home dummy* and *MB high* × *Home dummy* is always statistically significant. These results are consistent with the evidence on major car scandals and car recalls. Collectively, our results indicate that, in line with our prediction, home-country media slant increases substantially during bad times for companies.

5.4International editions of the Wall Street Journal

So far, we have focused on domestic newspapers in different countries. Now, we ask whether home-country media slant extends to the international editions of a given media outlet. In particular, we look at how US and German car manufactures are portrayed in the US and European

editions of the *Wall Street Journal* (*WSJ*). This is a particularly interesting case because both editions have a substantial readership and, ultimately, the same owner. Moreover, the same journalists write many of the articles in both editions, and as both editions are in English, the same Prime Research employees can code them.

Because both editions are in English, it also makes it easier to detect media slant. For example, in September 2015, General Motors reached a settlement agreement with the U.S. Justice Department regarding the company's problems with faulty ignition switches. Both editions reported on this event on Friday, September 18, and the same lead journalist was in charge of both articles. The European *WSJ* edition article began with the following paragraph:

> *General Motors Co. will pay $900 million to settle criminal charges with the U.S. Justice Department for the auto maker's botched handling of an ignition-switch defect that led it to recall millions of vehicles and was linked to more than 100 deaths.*

The US *WSJ* edition article about the same event began as follows:

> *General Motors Co. admitted to criminal wrongdoing and agreed to pay a lower-than expected financial penalty in the mishandling of a defective ignition switch, closing a chapter in a safety crisis that dented the auto maker's finances and reputation.*

The two articles ultimately delivered the same facts, but the US edition's opening paragraph, with the emphasis on *"a lower than-expected financial penalty"* and the fact that this is *"closing a chapter in a safety crisis"* clearly sets a more positive article spin. In our data, the European edition article was assigned an overall tone of −1.14, whereas the US edition article was assigned a tone of +0.16.

September 18, 2015, also marks the beginning of the Volkswagen scandal. On the following Monday, September 21, both printed *WSJ* editions reported on the event. The same lead journalist was in charge of both articles. However, the choice of words and of article formatting[10] suggested a more negative article spin in the US edition. In our data, the European edition article was assigned an overall tone of −1.93; the US edition article, a tone of −2.15.

These examples indicate that, indeed, the US *WSJ* edition reports more favorably about the US companies and that the European *WSJ* edition reports more favorably about the European companies. To test this formally, we re-define *Home dummy* by setting it to one for news about German companies in the *WSJ*'s European edition and for news about US companies in the *WSJ*'s US edition.

The results are presented in Table 6. In the univariate regression, the estimated coefficient on a home dummy is 0.19 and is significant with a *t*-statistic of 2.30. When we include fixed effects and other control variables, the estimated coefficient drops to 0.16, while the *t*-statistic increases to 4.75. Even when we focus on a subsample of observations in which news about the same brand is reported in both editions on the same day, and when we add journalist × coder cross-fixed effects, the coefficient on a home dummy is 0.13 and significant, with a *t*-statistic of 3.21. Favorable reporting about home companies thus extends to international editions of the same newspaper.

We acknowledge that the estimated coefficient on a home dummy is smaller than in the main analysis, where we compare all German and US newspapers (the coefficient is 0.27 in Table 2, column 9). The *WSJ* European edition, however, does not target German readers specifically, but rather all European readers, including readers in other countries with their own car industries.

[10] In the US edition, the number of cars affected by the scandal was printed in bold, large font, and in red. In the European edition, the same number was reported in normal font.

Moreover, in both editions the news is reported in English, which makes it easier for readers to detect media slant. The mere fact that there are *any* differences between the news reported in both editions, suggests that newspapers are catering the news to their particular audience.

6 Other sources of home-country media slant

We have hypothesized that home-country media slant reflects the news provider's profit-maximizing choice to cater to media consumers' beliefs (Mullainathan and Shleifer, 2005; Gentzkow and Shapiro, 2006). In principle, home-country media slant could also arise for many other reasons. On the supply side, media slant can reflect the views of journalists, editors, or media owners (Djankov et al., 2003; Baron, 2006; Besley and Prat, 2006). Media slant can also result from favorable reporting about companies that advertise in newspapers (Ellman and Germano, 2009; Gurun and Butler, 2012), or from the quid pro quo relationships, where journalists receive private information in exchange for a positive spin on the news (Dyck and Zingales, 2003a; 2003b). In this section, we compare and discuss the empirical support for our hypothesis versus the alternative sources for media slant.

6.1 Demand for news or preferences of journalists, editors, and media owners

If supply side effects were the main source of home-country media slant, we should observe that the estimated coefficient on a home dummy decreases substantially and becomes insignificant after controlling for newspaper and journalist fixed effects. Instead, we find that the addition of these fixed effects decreases the estimated coefficient only slightly and that home dummy remains highly significant (Table 2 and 6). Moreover, we find evidence for media slant not only when we compare national newspapers from different countries, but also when we compare international editions of *The Wall Street Journal*. Media slant is evident even in the subsample where news in

both editions of the *WSJ* is published on the same day and where we control for journalist times coder fixed effects. As both editions also have the same owner, these results cannot be reconciled with supply side effects.[11] The evidence is consistent, however, with our hypothesis that editors and journalists devote extra effort to cater news to international readers.

Our catering hypothesis is also consistent with the effects of competition in the market for news. In each of the countries analyzed, there are many newspapers competing for the readers at the national level. Gentzkow and Shapiro (2008) provide theoretical arguments that, in face of competition, news providers would forgo their own views in order to survive in the long run; however, media slant can persist even in perfectly competitive markets when readers themselves prefer biased news (see also Mullainathan and Shleifer, 2005). Moreover, since competition generally increases firms' incentive to deliver the customers what they want, the catering to media consumers may increase with competition, which makes national newspapers particularly susceptible to demand-based media slant.[12]

6.2Demand for news versus advertising effects

Competition in the media market also mitigates the effects of advertising. Unless readers prefer biased news, filtering news to curry favor with companies reduces readership, which in turn lowers future advertising revenue. Empirically, advertising effects have been shown to apply mainly to local newspapers and to specialized financial media (Reuter and Zitzewitz, 2006; Gurun and

[11] Because of the journalist times coder fixed effects, the difference in the tone of news between the *WSJ* editions also cannot be driven by Prime Research employees that coded the news.

[12] According to the news-catering hypothesis, we would expect media slant to be strongest in countries that score highly on measures of national pride and self-esteem. With only three country pairs, it is difficult to provide a proper test. The fact that home-country media slant is highest for country pairs involving the US (Table 2, columns 9–11), however, is consistent with the fact that the US scores highest in terms of national pride among the countries analyzed (Smith and Kim, 2006).

Butler, 2012). Neither of these two studies finds that advertising affects reporting by national newspapers.

In our study, we only use national editions of newspapers. Therefore, we do not expect advertising effects to be an important driver of home-country media slant. Because we only have detailed data on advertising expenditures for the US newspapers, we cannot replicate these studies exactly. Instead, we proceed as follows. Using the US data, we first establish that monthly brand-level expenditures for newspaper ads are highly correlated (at 0.65) with monthly brand-level car sales.[13] Next, we use one-month lagged country-specific brand-level car sales as an additional control variable in our main regression.

Results are presented in Table 7. When both sales and home dummy are included in the same regression, the estimated coefficient on sales is insignificant, while the coefficient on a home dummy remains largely unchanged and significant, both in the entire sample (0.32, with a *t*-statistic of 5.09) as well as in the subsample comprising each country's three major newspapers (0.30 with a *t*-statistic of 7.40).[14] We interpret these results as a confirmation that the advertising effects are not the main driver of the home-country media slant in national newspapers.

Our original data also include some limited information on regional newspapers (22,633 segments for our sample of companies). If our proxy for advertising is valid, following Gurun and Butler (2012), we should observe that sales affect reporting by regional newspapers. We find confirmatory evidence in untabulated results. Repeating our main regression (Table 2, column 6)

[13] *Monthly brand-level expenditures for newspaper ads* are defined as the aggregate sum of the monthly advertising expenditures for a given brand in over 200 US newspapers, standardized by the total monthly expenditures for all car brands in our sample. *Monthly brand-level sales* are defined as the sum of cars and light trucks sold by a given brand in a given country and month, divided by the total number of cars and light trucks sold in that country-month.

[14] In untabulated results, we verify that the results are largely unchanged if we exclude luxury brands, such as Rolls-Royce, Bentley, and Lamborghini (for which sales are probably not a good proxy for advertising), or if we exclude news about General Motors (where sales are based on the aggregate sales for all brands that belong to GM).

using news in regional editions, we find a much higher coefficient on a home dummy (0.91 for regional editions versus 0.28 for national editions). However, in contrast to the case of national editions, controlling for lagged car sales reduces substantially the estimated coefficient on a home dummy, from 0.91 to 0.42. Thus, like Gurun and Butler (2012), our results suggest that advertising affects reporting by local newspapers, but it does not seem to affect reporting by national newspapers.

6.3Demand for news versus quid pro quo relations

The strong competition for the audience at the national level should also mitigate the extent to which journalists can report favorably about companies that provide them with advanced access to information. Empirically, the effects of quid pro quo relationships tend to be concentrated among less reputable newspapers (Dyck and Zingales, 2003b). In comparison, in our analysis, we only use national newspapers. We also control for journalist fixed effects. Moreover, our results are robust to including only the three largest—and, presumably, most reputable—newspapers in each country.

Furthermore, since equity prices are most sensitive in times of high market valuations, the effects of quid pro quo relations are expected to be strongest during good times for companies (Dyck and Zingales, 2003a; 2003b). Instead, we find that media slant increases in times of low market valuations, as predicted by the news-catering hypothesis.

Overall, we conclude that, while many factors may contribute to media slant, the documented home-country media slant is most consistent with our hypothesis that media cater the presentation of the news to home bias in people's perceptions of companies.

7 Home-country media slant and the stock market

So far, we have argued that home-country media slant is consistent with national newspapers catering the presentation of the news to their home-country audiences. Since investors are also media consumers, this furthermore implies that home-country media slant may *reflect* cross-country differences in investor sentiment toward these companies.

In this section, we test this proposition by relating media slant to equity prices. Specifically, in section 7.1, we focus on domestic equity markets and ask whether home-country media slant predicts future domestic stock returns. In section 7.2, we focus on cross-listed companies and ask whether cross-country differences in media reporting predict temporary stock price deviations of cross-listed stocks.

National newspapers may not only reflect cross-country differences in investor sentiment. By deciding which news to report and how to report it, newspapers may also affect or *reinforce* investor sentiment. In section 7.3, we build on the theory of biased beliefs to devise two tests related to the reinforcement effects of media.

Before proceeding, note that we do not need to assume that all investors exhibit a home bias. In addition, rational investors may try to profit from any mispricing arising from the home bias. However, there exist important limits to arbitrage. Because of language barriers and the higher cost of accessing international coverage, media markets across countries are largely segmented. If all media in a given country slant the news in the same direction, investors may be unable to distinguish media slant from the news about the underlying event being reported. Furthermore, national newspapers lend the news a sense of credibility and create common knowledge. Given that some investors may well act on the slanted information, the risk that the sentiment may drive

prices even further away from the fundamental value may deter rational investors from trading against the crowd (De Long et al., 1990).

7.1Domestic equity markets: Betting against the home media

According to Bloomberg's reported geographical distribution of ownership, home investors are the largest shareholders of the companies in our sample. In 2016, American, Japanese, and German investors jointly held on average 67.15% of the stock in our companies. Home-country investors accounted for the vast majority (74.81%) of this ownership. This implies that home investors are marginal investors in our setting.[15]

If home investors are most important for setting prices in domestic equity markets, then overly positive news in the home media may signal that investor sentiment in the home country is overly high and equity prices are temporarily overvalued. We therefore anticipate that an abnormally high home media news tone will be associated with negative future stock returns. Conversely, we expect that an abnormally low home media news tone will be associated with positive future stock returns.

We test this hypothesis using long–short portfolio sorts of our sample companies. In order to allow for enough time for price corrections, we follow Gurun and Butler (2012) and conduct this analysis at the monthly horizon. We define home news tone as the average tone across all news segments published in a company's home country during a given month. Similarly, foreign news tone is the average tone across all news segments published outside a company's home country during a given month. Because news that reaches more people is more likely to capture country-specific investor sentiment, we always weight news tone by the visibility of each news segment.

[15] In line with this proposition, we find (in untabluated results) that home media news tone is positively and significantly correlated with contemporaneous returns, whereas foreign news tone is uncorrelated with contemporaneous returns. For consistency with portfolio analysis, we conduct this test at the monthly frequency. We also control for lagged returns as well as logarithms of size, market-to-book, and news visibility.

On average, the monthly home-media news tone is 0.81, and the foreign-media news tone is 0.58. Both news tones vary substantially over time and across companies. The monthly cross-sectional median for the difference between the home and the foreign media news tone is 0.17, and its standard deviation is 0.43.

Our criteria for periods of abnormally high home media news tone are that, in a given month and for a given company: (i) home media news tone is more positive than foreign media news tone, and (ii) the difference between the home and foreign media news tone is greater than its cross-sectional median. When both conditions are satisfied, we include the company in the next month's short portfolio; otherwise, we include it in the next month's long portfolio. If no company qualifies for a given portfolio in a given month, we set returns equal to the risk-free rate.[16] All portfolios are rebalanced monthly. Since this strategy involves shorting stocks with abnormally high home media news tone, we refer to it as *betting against the home media.* We control for exposure to risk by regressing portfolio returns on the Fama and French (2015) five global risk factors, and we use Newey and West (1987) *t*-statistics with six lags to assess statistical significance.

Table 8 presents our regression results for value-weighted portfolios (Panel A) and for equally weighted portfolios (Panel B). If we invest in all automotive companies in our sample, the monthly alpha is either 0.02% or 0.29% and insignificant. The long–short portfolio, however, has a positive and statistically significant monthly alpha that ranges between 1.48% (*t*-statistic of 2.18) for equally weighted portfolios and 2.24% (*t*-statistic of 2.93) for value-weighted portfolios. The long-short portfolio alphas stem mostly from the short portfolios, especially in the case of the value-weighted portfolio. The coefficient on the market risk premium in the long–short portfolios is

[16] This happens only once for the short portfolio in 2007.

negative and significant. This means that the strategy of betting against the home media has a *negative* exposure to market risk. The other risk factors are insignificant. The Sharpe ratio of our long–short portfolio is also relatively high. If we invest in all of our sample's companies, the Sharpe ratio is either 0.08 or 0.28; this value increases to between 0.54 and 0.84 for the investment strategy of betting against the home media.

In untabulated results, we examine the sensitivity of our results along several dimensions. Starting with the time-series variation, we note that the strategy was most profitable during the 2008–2009 crisis, which was particularly detrimental to the automotive industry. Importantly, we find that our results persist only if we weight news tone by its visibility; the alphas are much smaller and insignificant if we take a simple average across the news tone. This finding is consistent with the equilibrium outcome of demand-based models for media slant: newspapers that are better at catering news to the general population attain a larger market share, which in turn renders their news more visible. News that is more visible is also more likely to influence investor beliefs. Sorting on the visibility rather than the tone of news, however, does not lead to a profitable trading strategy.[17] This suggests that how news is reported is more important than how visible the news is.

7.2 Home-country media slant and cross-listed stocks

Our analysis of domestic equity markets is suggestive of a strong link between investor beliefs and cross-country differences in media reporting. One caveat to this analysis is that we only have one stock price per company, which makes it difficult to control for all possible sources of risk.

[17] Fang and Peress (2009) show that visibility effects are concentrated among small stocks that are neglected by the national media. Our sample includes large stocks with substantial national media coverage.

To address this concern, we next exploit the simultaneous trading of companies on the stock exchanges of different countries. Cross-border arbitrage ensures that stock prices across countries are generally aligned. However, there are frequent and nontrivial differences between prices of the same stock traded in different markets (Gagnon and Karolyi, 2010). We test whether such stock price deviations can be predicted by differences in media reporting between the countries.

Equity holders of a given stock are entitled to the same cash flows regardless in which country shares are traded. This means that temporary stock price deviations cannot be driven by differences in companies' characteristics. In addition, matching synchronous prices from different markets has the advantage of allowing us to explore the predictive relations at a daily frequency.

We require that a company be traded in at least two countries and that there be some overlap in trading hours between the stock markets, so that we can match prices from both markets at the exact same time. In addition, we require that news in both countries be based on the same time period. Our data cover morning editions of printed newspapers; therefore, the news in each country is available to investors in the morning and refers to events that occurred through the previous day. Thus, the requirement that news across countries be based on the same time period is satisfied, provided the time difference between countries is not too great.

Our sample includes German, Japanese, and American car companies. German car companies are traded in the United States as sponsored American Depositary Receipts (ADRs) or as global registered shares, and American car companies are cross-listed in Germany. The time difference between Frankfurt and New York is five or six hours, depending on whether Daylight Savings Time (DST) is in effect, so there are a few hours of overlap in the trading hours of these two countries' stock markets. It is also reasonable to assume that the news in the daily morning editions in both countries corresponds to events that occurred during the same time period.

Japanese companies are traded in both the United States and in Germany. However, the 13- to 14-hour time difference between Tokyo and New York means there is no overlap in stock market trading hours and neither is there any overlap between Tokyo and Frankfurt. Moreover, because of the wide time differences, one cannot safely assume that the daily news in Japan covers the same time frame as the news in Germany and United States. For these reasons, we restrict our analysis to the set of German and American car companies and to the stock markets and news data in these two countries.

To match stock market prices, we take the currency-adjusted opening or closing price from the foreign market and match it with the time-stamped price in the home market. In particular, for German companies, we take the euro-denominated US opening price and match it with the corresponding 3:30 pm price in Frankfurt (or 2:30 pm for a few weeks in March and November, because the United States switches to DST ahead of Germany). For BMW and Volkswagen, we take ADR prices that correspond to ordinary shares traded in Germany. For Daimler AG, we rely on the global registered shares because they are more actively traded and cover a longer time period than the corresponding ADRs.[18] We adjust prices for ADR ratios. We have data for all German companies for the entire period from January 2007 through December 2016; the only exception is BMW, for which ADR prices start on 5 November 2008.

For US companies, we take the dollar-denominated closing price in Germany and match it with the US price at 11:30 am Eastern Time (or 12:30 pm, depending on the DST switch). Both Ford and General Motors are cross-listed, while Chrysler was privately held until it was acquired by Fiat.[19] The data for Ford begin in January 2007; the data for General Motors start on 8 November 2010, when it emerged from bankruptcy.

[18] Symbols BMWYY (ADR ratio 3:1) for BMW, VLAKY (5:1) for Volkswagen, and DDAIF (1:1) for Daimler AG.
[19] Symbols FMC1 for Ford and 8GM for General Motors.

We define the daily relative stock price difference as the difference between the home and foreign price, standardized by the home price: $\left(P^{Home} - P^{Foreign}\right) / P^{Home}$. We require that the daily trading volume in both markets be positive and that the home stock price exceed $3.00. This latter requirement eliminates some observations for Ford during the 2008–2009 transition when it was on the verge of bankruptcy. We also eliminate observations for Volkswagen during October and November 2008 to avoid contaminating results with a "VW great short squeeze."[20]

For each day and each company, we take the visibility-weighted average news tone in home and foreign newspapers. We then run a pooled regression of relative stock price differences on home news tone and foreign news tone (or the difference between them):

$$\left(\frac{P_{t,i}^{Home} - P_{t,i}^{Foreign}}{P_{t,i}^{Home}}\right) = \alpha + \beta_{HT} Home\ news\ tone_{t,i} + \beta_{FT} Foreign\ news\ tone_{t,i} + \lambda Controls_{t,i} + \varepsilon_{t,i}. \quad (2)$$

To control for the persistence in relative stock price differences, we use the lagged $(t-1)$ relative stock price difference and a five-day average for relative stock price differences between days $t-2$ and $t-6$. We also control for the log of daily visibility of home and foreign news. Following Froot (1989) and Tetlock, Saar-Tsechansky, and Macskassy (2008), we compute standard errors clustered by trading day.

Newspapers do not publish reports about all the companies every day, and home newspapers report news about home companies more frequently than do foreign newspapers. We eliminate days when neither home nor foreign media report anything about a particular company. For the remaining days, we follow two alternative strategies. Under the first alternative, if news about a particular company is reported in at least one country, we set missing observations for news tone

[20] During the short squeeze, Volkswagen temporarily became the world's most valuable company. Its stock price rose from €200 to more than €800 before plummeting back to its previous level.

in the other country to zero (neutral news tone). We also set missing observations for the logarithm of visibility to zero. Under the second alterative, we keep only days when news about a company is reported in both home and foreign market.

Table 9 reports the summary statistics. Under the first alternative, we have observations for a total of 10,058 company-trading days; under the second alternative, the number of observations is 5,596. The relative stock price difference is slightly positive on average; it ranges between −7.61% to +7.11% with a standard deviation of 0.71%. The average difference between the daily home news tone and foreign news tone is 0.50 or 0.21, depending on how we treat missing observations. It ranges from −5.12 to +5.84, with a standard deviation of 1.62 or 1.76.

Table 10 reports the regression results. The difference between home and foreign news tone is always positively and significantly related to the relative stock price difference. The associated *t*-statistic ranges from 2.41 to 3.58. The effect is attributable mainly to the home media. While the estimated coefficient on home news tone is always positive and significant, the estimated coefficient on foreign news tone is negative but seldom statistically significant. Results are somewhat stronger when we replace missing observations with zeros. Visibility of home and foreign news tone enters with a negative and insignificant coefficient.

7.3Does home-country media slant reinforce investor beliefs?

Both analyses (analysis of domestic equity markets and of cross-listed stocks) reveal a strong correlation between equity prices and home-country media slant. This is consistent with the notion that media slant *reflects* cross-country differences in investor sentiment.

As discussed above, the way media filter news to their audiences can also *affect* investor beliefs. In order to test for a causal effect of media slant on investor beliefs, we would ideally identify days when news is created but it does not reach the audience. For example, in the study

of local newspapers and local trading, Engelberg and Parsons (2011) use extreme weather as a shock to newspaper delivery. In their sample period, weather is a valid instrument as local newspapers were physically distributed. In our period, national newspapers can also be accessed online. Thus, we cannot use disruptions to delivery to test for causality.[21]

In absence of exogenous shocks to dissemination of news, we devise two alternative tests that both speak to the causal effects of media slant on investor behavior. Specifically, in the first test, we build on the theory of confirmatory bias (Rabin and Schrag, 1999). In the second test, we follow Peress and Schmidt (2018) and exploit shocks to investor attention to news (rather than shocks to dissemination of news).

7.2.2 Confirmatory bias

When readers have prior beliefs, they receive greater utility from news that confirms their priors (Mullainathan and Shleifer, 2005). At the same time, they perceive such news as more reliable. Indeed, the fact that readers perceive confirmatory news as being of higher quality is the main driver for demand-based media slant in the theoretical model of Gentzkow and Shapiro (2006). As shown by Rabin and Schrag (1999), *confirmatory bias* also implies that individuals are more likely to act on information that confirms their prior beliefs, and they tend to ignore new evidence when it is inconsistent with those beliefs (see also Pouget, Sauvagnat, and Villeneuve, 2017).

In our setting, demand-based home-country media slant arises when a company's home-country media consumers hold higher priors about a company than foreign media consumers do.

[21] Peress (2014) uses newspaper strikes to examine the effect of media on the stock market. In our case, we cannot use national newspaper strikes because we require that the news is created and the tone of news can be measured. In addition, newspaper strikes are very infrequent.

The confirmatory bias then implies that beliefs can be reinforced when news about home companies is positive and news about foreign companies is negative. This is also when we should observe that the relation between news and temporary stock price deviations is strongest.

We test this hypothesis by analyzing subsamples in which we progressively eliminate days with news that contradict the assumed priors. Specifically, we first disregard days when home news tone is extremely negative (–1.5) and when foreign news tone is extremely positive (+1.5). Next, we disregard days when home news tone is below −0.5 and foreign news tone exceeds +0.5. Finally, we disregard all days when home news tone is negative and foreign news tone is positive.

Results are presented in Table 11. In line with our hypothesis, as the described filter becomes stricter, the association between home-country media slant and temporary stock price deviations becomes stronger. The estimated coefficient on the difference in news tone more than triples when we move from the sample consisting of all days to the subsample consisting only of those days on which home news tone is positive and foreign news tone is negative. The estimated coefficient remains significant despite the substantial reduction in the sample size.[22]

7.2.3 Distracted investors

Not all investors may exhibit a home bias, and neither do all investors pay attention to published news. If media affects investor behavior, we therefore expect the relation between home-country media slant and stock prices to vary as a function of the attentiveness of investors that are most prone to home-country media slant.

Attention to stocks is endogenous to company-specific events and is difficult to measure. We thus follow Peress and Schmidt (2018) and focus on events that divert rather than attract investor

[22] In untabulated results, we verify that the coefficient on the difference in the news tone is insignificant and virtually zero when we do the exact opposite and we keep only days when home news tone is negative and foreign news tone is positive.

attention. Specifically, Peress and Schmidt show that attention-grabbing public events divert investor attention and that such events affect mostly irrational and behavioral traders.

Along these lines, we posit that major sporting events may distract biased investors in our setting. Sports attract tremendous attention. Since people have limited attention, it therefore seems likely that, around the time of popular sporting events, investors pay less attention to company-specific news. Because supporting home athletes bears considerable similarity to holding biased beliefs about home companies, it also seems likely that the investors who are most prone to home-country media slant are the ones most distracted by sporting events. Finally, attention to sports is largely exogenous to company-specific news. It varies across countries depending on when each country's most popular sporting events take place and how successful the participating teams are.

We measure attention to sports using daily time series of Google searches on sports (cf. Schmidt, 2013). We focus on major sports because they are most likely to distract investors. In Germany, soccer is by far the most popular sport, followed by basketball. In the United States, all four US major league sports receive substantial attention. For the United States, then, we collect the data on search terms "football," "basketball," "baseball," and "hockey." For Germany, we collect the data on search terms "fussball," "fußball," and "basketball.[23]

For the United States, the average number of searches is greatest for football—although the other three major sports also receive considerable attention. Seasonal variation in searches matches the timing of regular seasons: fall for football and summer for baseball. Searches related to basketball increase substantially around the NCAA's March Madness tournament. For hockey, the largest spike occurred on February 21, 2014, the day on which the teams USA and Canada faced each other in the semi-final action at the Sochi Olympic Games.

[23] We use both "fussball" and "fußball" because these are two equivalent ways of writing "soccer" in the German language.

For Germany, Google search volume data confirm that soccer is by far the most prominent sport. On average, searches related to soccer exceed those about basketball by a factor of 15. Seasonal variation in soccer searches reflects the timing of the German and the European soccer leagues, but the largest increases in searches occur during the FIFA World Cups and the UEFA European Championships.

We aggregate daily searches per country and merge these aggregates with stock market data. We de-mean and de-trend the aggregated search data in each country by relying on the residuals from a regression of aggregated sports searches on a constant and a date. We then define days with high sports search activity as those on which, in either of the two countries, sports searches exceed the 90th percentile (denoted " SSA > p90") or the 95th percentile ("SSA > p95") in the set of all searches.

Results are reported in Table 12. In line with our hypothesis, the estimated coefficient on the difference in news tone decreases and becomes insignificant as we move from the full sample to subsamples with highest attention to sports. This trend holds when news is reported in at least one country, and it is even more pronounced for the subsamples of days on which company-specific news is published in both countries. In the latter case, the estimated coefficient (along with the associated *t*-statistic) is effectively zero on days characterized with highest attention to sports.

8 Conclusions

In this paper, we show that news about major car companies is systematically more positive in companies' home-country newspapers than in foreign newspapers. Results hold when we compare national newspapers across the countries as well as when we compare international editions of the same media outlet. The observed variation in the home-country media slant across the type of news

and signals for companies' good and bad times is most consistent with the media outlets catering the presentation of the news toward the home-country audiences.

Consistent with the catering hypothesis, we find that cross-country differences in media reporting correlate strongly with equity prices. An investment strategy of "betting against the home media" yields monthly risk-adjusted profits in excess of 1.4%. Cross-country differences in news tone predict temporary stock price deviations of cross-listed stocks. Since the pricing effects are strongest for confirmatory news and absent in times of outside distractions, our findings also indicate that national media has a feedback effect and reinforces investor existing beliefs.

More broadly, our findings suggest that catering to home-country readers may undermine the role of home media in providing external governance, and that foreign media are more likely to play a watchdog role than home-country media. By reinforcing investor optimism in home companies, home-country media slant may also help us understand why investors under diversify internationally.

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Table 1
Media slant—Summary statistics

This table reports the summary statistics for news tone and visibility for each of the nine car company groups in our sample. The unit of observation is a segment (i.e., self-contained message) of an article. Tone is assigned on a discrete scale from minus four to plus four. Visibility denotes the number of potential readers. Panel A reports the statistics for all media across the United States, Germany, and Japan. Panel B and C report the same statistics separately for home and foreign media. The period is January 2007 through December 2016.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	American companies			German companies			Japanese companies		
	GM	Ford	Chrysler	VW	Daimler	BMW	Toyota	Nissan	Honda
Panel A: All media									
Mean Tone	0.07	0.57	0.11	0.47	0.84	1.11	0.26	0.57	0.32
Std. Tone	1.90	1.84	1.84	1.96	1.76	1.70	2.00	1.87	1.98
Mean Visibility	21,528	19,281	24,583	11,644	10,731	10,951	46,863	47,949	39,500
Std. Visibility	47,951	37,783	52,317	35,912	34,835	30,956	104,749	103,986	81,721
No. of obs.	174,668	74,999	53,190	227,981	83,448	47,943	72,009	18,393	20,672
Panel B: Home media									
Mean Tone	0.23	0.67	0.28	0.62	0.86	1.15	0.49	0.61	0.53
Std. Tone	1.89	1.79	1.80	1.88	1.75	1.68	1.97	1.89	1.94
Mean Visibility	21,956	18,957	22,916	7,947	8,222	8,147	113,972	94,904	84,086
Std. Visibility	34,210	28,257	33,869	24,696	28,901	23,231	166,406	146,480	122,567
No. of obs.	107,000	60,819	42,948	192,115	74,318	40,660	21,585	7,557	7,071
Panel C: Foreign media									
Mean Tone	-0.18	0.13	-0.60	-0.32	0.73	0.91	0.16	0.54	0.22
Std. Tone	1.87	1.95	1.84	2.16	1.81	1.79	2.01	1.85	1.98
Mean Visibility	20,851	20,672	31,575	31,449	31,148	26,602	18,135	15,203	16,320
Std. Visibility	63,904	64,216	96,667	66,823	61,843	54,835	32,602	27,957	27,753
No. of obs.	67,668	14,180	10,242	35,866	9,130	7,283	50,424	10,836	13,601

Table 2

Media slant—Main regression results

This table reports regression results:

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

Tone is measured on day *t* for car brand *i* in country *c*. *Home dummy* is defined as one for tone measured in the country of car brand ultimate owner (car company's home country). We include country, country-of-origin, company × year-month, coder, newspaper, and journalist fixed effects. *Controls* include visibility, a set of dummy variables (for articles that include a photo, for articles with unknown journalist, for articles written by the editorial board, and for articles referencing experts, financial institutions and public entities), and number of newspapers per country-month. Columns 1–6 are based on all national newspapers in the United States, Germany, and Japan. Columns 7–8 are based on the national editions of the three most important newspapers per country. Columns 9–11 report results for combinations of country pairs. Intercept is included only in a regression without fixed effects. In parentheses below the estimated coefficients are *t*-statistics with errors clustered at the company level. The period is January 2007 through December 2016.

	(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
R^2	0.02	0.07	0.23	0.25	0.26	0.26	0.25	0.29	0.26	0.22	0.32

Table 3
Media slant by type of news

This table reports regression results:

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

Tone is measured on day *t* for car brand *i* in country *c*. *Home dummy* is defined as one for tone measured in the country of car brand ultimate owner (car company's home country). Column 1 reports results for the subsample of observations where the information on the general topic and the timing of news events are given. Column 2 reports results for a subsample where news about the same car brand is reported in all three countries within the same week. In column 3, we additionally require that the news be about the same general topic. In column 4, the news must also have the same timing of news events (past, present, future). In column 5, we repeat results from column 1 by including interaction terms between the *Home dummy* and dummy variables based on the topic and the timing of news events. *Low* includes news about company structure and market position. *Medium* includes news about product strategy, corporate strategy, financial performance and management. *High* includes news about employee relations and corporate social responsibility and ecology. The interaction terms between the news topic and the news timing are included as fixed effects. The other fixed effects and other control variables are the same as those in column 6 in Table 2. In parentheses below the estimated coefficients are *t*-statistics with errors clustered at the company level. In brackets in column 5 is the *t*-statistic for the difference between the coefficients on *Home dummy* × *High* × *Future* and *Home dummy* × *Low* × *Past*. The period is January 2007 through December 2016.

	(1)	(2)	(3)	(4)	(5)
Same year-week and brand		Yes			
Same year-week, brand, and topic			Yes		
Same year-week, brand, topic, and time				Yes	
Home dummy	0.26	0.29	0.31	0.29	
t-stat.	(8.16)	(7.85)	(7.77)	(6.82)	
Home dummy × Low × Past					0.05
t-stat.					(0.45)
Home dummy × Low × Present					0.09
t-stat.					(0.77)
Home dummy × Low × Future					0.17
t-stat.					(1.91)
Home dummy × Medium × Past					0.22
t-stat.					(2.80)
Home dummy × Medium × Present					0.30
t-stat.					(6.59)
Home dummy × Medium × Future					0.28
t-stat.					(5.35)
Home dummy × High × Past					0.26
t-stat.					(1.45)
Home dummy × High × Present					0.32
t-stat.					(3.73)
Home dummy × High × Future					0.63
t-stat.					(7.46)
t-stat. (Difference)					[3.51]
Fixed effects					
Timing × Topic	-	-	-	-	Yes
Other Fixed effects	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes
N	682,279	465,056	272,221	196,022	682,279
R^2	0.25	0.27	0.30	0.32	0.27

Table 4

Media slant, auto scandals, and car recalls

This table reports regression results:

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

Tone is measured on day *t* for car brand *i* in country *c*. *Home dummy* is defined as one for tone measured in the country of car brand ultimate owner (car company's home country). We add a set of dummy variables. *VW scandal* takes a value one for news about Volkswagen group between 18 September 2015 and 31 December 2015. *Toyota crisis* takes a value one for news about Toyota group between 28 August 2009 and 31 January 2010. *Recall* takes a value one if there was a recall announced on day *t* for car brand *i*. The fixed effects and other control variables are the same as those in column 6 in Table 2. In parentheses below the estimated coefficients are *t*-statistics with errors clustered at the company level. The period is January 2007 through December 2016.

	(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

Table 5
Media slant in good times and in bad times

This table reports regression results:

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

Tone is measured on day *t* for car brand *i* in country *c*. *Home dummy* is defined as one for tone measured in the country of car brand ultimate owner (car company's home country). Column 1 reports results for the subsample of observations where the stock market data are available. In columns 2–5, we add a set of additional variables. *MB* is market-to-book ratio, *MV* is market value, and *Lag ret* is monthly return (approximated by 21-trading-day return) lagged by one day. *MB low* equals one if $MB < a$, *MB medium* equals one if $a \leq MB < b$, *MB high* equals one if $MB \geq b$. The fixed effects and other control variables are the same as those in column 6 in Table 2. In parentheses below the estimated coefficients are *t*-statistics with errors clustered at the company level. In brackets are the *t*-statistics for the difference between the coefficients on *MB low* × *Home dummy* and *MB high* × *Home dummy*. The period is January 2007 through December 2016.

	(1)	(2)	(3)	(4)	(5)
			a = 0.7 b = 1.3	a = 0.6 b = 1.4	a = 0.5 b = 1.5
Home dummy	0.26	0.26			
t-stat.	(10.87)	(10.86)			
MB		0.01			
t-stat.		(2.83)			
MV		0.00	0.00	0.00	0.00
t-stat.		(0.24)	(0.24)	(0.32)	(0.34)
Lag ret		0.62	0.60	0.57	0.55
t-stat.		(2.53)	(2.74)	(2.45)	(2.35)
MB low			-0.28	-0.54	-0.61
t-stat.			(-1.52)	(-2.59)	(-2.62)
MB high			0.21	0.07	0.11
t-stat.			(2.21)	(0.52)	(0.84)
MB low × Home dummy			0.51	0.55	0.53
t-stat.			(6.60)	(7.33)	(8.17)
MB medium × Home dummy			0.09	0.13	0.20
t-stat.			(1.08)	(1.98)	(3.19)
MB high × Home dummy			0.19	0.20	0.21
t-stat.			(2.68)	(2.96)	(3.02)
t-stat. (Difference)			[2.27]	[2.51]	[2.56
Other controls	Yes	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes	Yes
N	498,762	498,762	498,762	498,762	498,762
R^2	0.29	0.29	0.29	0.29	0.29

Table 6
Media slant—International editions of *The Wall Street Journal*

This table reports regression results for the sample of news about the US and German car companies in the US and the European editions of the *Wall Street Journal*:

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

Tone is measured on day *t* for car brand *i* in country *c*. *Home dummy* is defined as one for the news about German companies in the European edition of the *WSJ*, and as one for news about the US companies in the US edition of the *WSJ*. We include country, country-of-origin, company × year-week, coder, and journalist fixed effects. *Controls* include visibility and a set of dummy variables (for articles that include a photo and for articles referencing experts, financial institutions and public entities). Column 5 reports results for a subsample when news about a given brand occurs in both editions of the *WSJ* on the same day. In Column 5, we add coder × journalist fixed effects. Intercept is included only in a regression without fixed effects. In parentheses below the estimated coefficients are *t*-statistics with errors clustered at the company level. The period is January 2007 through April 2016.

	(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

Table 7
Media slant and car sales

This table reports regression results:

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

Tone is measured on day *t* for car brand *i* in country *c*. *Home dummy* is defined as one for tone measured in the country of car brand ultimate owner (car company's home country). Column 1 reports results for the subsample of observations where information on sales is available. *Sales* on day *t* is defined as one month lagged market share of car sales for brand *i* in country *c*. The fixed effects and control variables are the same as those in column 6 in Table 2. In parentheses below the estimated coefficients are *t*-statistics with errors clustered at the company level. The period is February 2007 through December 2016.

	(1)	(2)	(3)	(4)	(5)	(6)
				Major newspapers		
Home dummy	0.28		0.32	0.27		0.30
t-stat.	(9.81)		(5.09)	(11.16)		(7.40)
Sales		0.01	0.00		0.01	0.00
t-stat.		(5.00)	(-0.81)		(4.24)	(-1.52)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	762,456	762,456	762,456	117,653	117,653	117,653
R^2	0.26	0.26	0.26	0.25	0.25	0.25

Table 8
Betting against the home media

This table reports regression results of monthly portfolio returns on the Fama and French global factors. All portfolios are rebalanced monthly. If the difference between the home media news tone and the foreign media news tone is positive and higher than the cross-sectional median for this difference, the company comprises part of the next month's short portfolio; otherwise, it is included in the long portfolio. Portfolios are either value-weighted (Panel A) or equally-weighted (Panel B). The global factors are market return in excess of the risk-free rate (Mkt-Rf), small minus big (SMB), high minus low book-to-market (HML), profitability (RMW) and investments (CMA). In parentheses below the estimated coefficients are Newey and West (1987) *t*-statistics with six lags. Sharpe ratios are annualized. The period is January 2007 through December 2016.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All companies		Long portfolio		Short portfolio		Long/Short portfolio	
Panel A: Value-weighted portfolios								
Sharpe Ratio	0.08		0.41		-0.44		0.84	
Intercept	-0.24	0.02	0.40	0.69	-1.99	-1.54	2.39	2.24
	(-0.57)	(0.03)	(0.86)	(1.35)	(-3.31)	(-2.38)	(3.42)	(2.93)
Mkt – Rf	0.91	0.79	0.84	0.72	1.60	1.36	-0.77	-0.65
	(10.29)	(6.70)	(8.71)	(5.60)	(12.94)	(8.43)	(-5.31)	(-3.41)
SMB		-0.13		-0.29		0.18		-0.47
		(-0.40)		(-0.84)		(0.43)		(-0.93)
HML		0.30		0.36		0.27		0.09
		(0.90)		(1.01)		(0.60)		(0.16)
RMW		-0.41		-0.53		-0.48		-0.06
		(-0.84)		(-1.00)		(-0.71)		(-0.07)
CMA		-0.51		-0.43		-1.36		0.92
		(-1.27)		(-0.98)		(-2.45)		(1.43)
N	120	120	120	120	120	120	120	120
R^2	0.47	0.48	0.39	0.41	0.59	0.61	0.19	0.23
Panel B: Equally-weighted portfolios								
Sharpe Ratio	0.28		0.46		-0.07		0.54	
Intercept	0.09	0.29	0.48	0.78	-0.98	-0.69	1.46	1.48
	(0.21)	(0.60)	(1.09)	(1.63)	(-1.56)	(-1.02)	(2.37)	(2.18)
Mkt – Rf	1.22	1.06	1.03	0.87	1.71	1.48	-0.67	-0.60
	(13.48)	(8.95)	(11.42)	(7.31)	(13.19)	(8.72)	(-5.33)	(-3.58)
SMB		0.03		-0.21		0.27		-0.48
		(0.10)		(-0.65)		(0.60)		(-1.06)
HML		0.57		0.38		0.77		-0.39
		(1.73)		(1.13)		(1.62)		(-0.83)
RMW		0.06		-0.32		0.06		-0.38
		(0.12)		(-0.63)		(0.09)		(-0.54)
CMA		-0.90		-0.84		-1.33		0.49
		(-2.23)		(-2.06)		(-2.29)		(0.84)
N	120	120	120	120	120	120	120	120
R^2	0.61	0.63	0.52	0.54	0.60	0.62	0.19	0.21

Table 9
Multimarket trading—Summary statistics

This table reports the summary statistics for the multi-market trading analysis. Daily relative stock price difference for a given company is defined as $\left(P_{t,i}^{Home} - P_{t,i}^{Foreign}\right) / P_{t,i}^{Home}$. Currency adjusted foreign prices are matched with synchronous prices from the home market. Daily home news tone is the visibility-weighted average news tone across all the segments published in home newspapers for a given company. Foreign news tone is the visibility-weighted average news tone across all the segments published in foreign newspapers. Results are based on the U.S. and German companies traded in the U.S. and Germany. If there is no news reported in home or foreign markets on a given day, we assign a neutral news tone of zero (Panel A). In Panel B, we repeat the summary statistics for days when news is reported both in home and foreign newspapers. Summary statistics for the relative stock price differences are expressed in percentages. The period is January 2007 through December 2016.

	Mean	Std.	Min.	Max.	N
Panel A: News reported at least in one country (missing values for news tone replaced by zeros)					
Relative stock price difference (%)	0.03	0.71	-7.61	7.11	10,058
Home news tone	0.86	1.22	-3.12	4.00	10,058
Foreign news tone	0.36	1.27	-4.00	4.00	10,058
Home news tone - foreign news tone	0.50	1.62	-5.12	5.84	10,058
Panel B: News reported in home and foreign country					
Relative stock price difference (%)	0.02	0.75	-7.61	7.11	5,596
Home news tone	0.81	1.22	-3.12	4.00	5,596
Foreign news tone	0.60	1.62	-4.00	4.00	5,596
Home news tone - foreign news tone	0.21	1.76	-5.12	5.84	5,596

Table 10
Multimarket trading—Predictive regressions

This table reports regression results of daily relative stock price differences on home and foreign news tone and control variables:

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

Currency adjusted foreign prices are matched with synchronous prices from the home market. Home news tone is the visibility-weighted average news tone across all the segments published in home newspapers for a given company *i* on day *t*. Foreign news tone is the visibility-weighted average news tone across all the segments published in foreign newspapers on the same day. Results are based on the U.S. and German companies traded in the U.S. and Germany. If there is no news reported in home or foreign markets on a given day, we assign a neutral news tone of zero (columns 1–4). In columns 5–8, we repeat results for days when news is reported in both home and foreign newspapers. Coefficients on news tone and log visibility are multiplied by 1,000. In parentheses below the estimated coefficients are *t*-statistics with errors clustered at the trading day. The period is January 2007 through December 2016.

	(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

Table 11
Multimarket trading—Confirmatory bias

This table reports regression results of daily relative stock price differences on home and foreign news tone and control variables:

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

Currency adjusted foreign prices are matched with synchronous prices from the home market. Home news tone is the visibility-weighted average news tone across all the segments published in home newspapers for a given company *i* on day *t*. Similarly, foreign news tone is the visibility-weighted average news tone across all the segments published in foreign newspapers on the same day. Results are based on the U.S. and German companies traded in the U.S. and Germany. If there is no news reported in home or foreign markets on a given day, we assign a neutral news tone of zero (columns 1–4). In columns 5–8, we repeat results for days when news is reported in both home and foreign newspapers. Results are reported separately for the whole sample (*All*) and subsamples where home news tone (*H)* is above a given threshold and foreign news tone (*F)* is below a given threshold. Coefficients on news tone and log visibility are multiplied by 1,000. In parentheses below the estimated coefficients are *t*-statistics with errors clustered at the trading day. The period is January 2007 through December 2016.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		News reported at least in one country				News reported in home and foreign country		
	All	H > - 1.5 F < 1.5	H > -0.5 F < 0.5	H > 0 F < 0	All	H > - 1.5 F < 1.5	H > -0.5 F < 0.5	H > 0 F < 0
Home news tone - foreign news tone	0.16	0.26	0.30	0.63	0.14	0.24	0.49	0.63
t-stat.	(3.58)	(3.87)	(3.17)	(2.58)	(2.41)	(2.29)	(3.30)	(2.58)
Rel. stock price diff. (t-1)	0.06	0.06	0.09	0.07	0.02	-0.02	-0.01	0.07
t-stat.	(2.97)	(2.13)	(2.90)	(0.99)	(0.68)	(-0.49)	(-0.14)	(0.99)
Rel. stock price diff.(t-2:t-6)	0.16	0.14	0.10	0.04	0.19	0.14	0.05	0.04
t-stat.	(3.88)	(2.78)	(1.94)	(0.38)	(3.29)	(1.87)	(0.57)	(0.38)
Log(Visibility home news)	-0.04	-0.00	-0.03	0.16	-0.06	0.10	0.10	0.16
t-stat.	(-1.20)	(-0.12)	(-0.61)	(0.93)	(-0.92)	(1.01)	(0.74)	(0.93)
Log(Visibility foreign news)	-0.02	-0.03	-0.05	0.06	-0.06	-0.07	-0.02	0.06
t-stat.	(-1.28)	(-1.53)	(-2.08)	(0.47)	(-1.08)	(-0.85)	(-0.16)	(0.47)
N	10,048	6,854	5,290	1,109	5,587	2,806	1,665	1,109
R2	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Table 12
Multimarket trading—Distracted investors

This table reports regression results of daily relative stock price differences on home and foreign news tone and control variables:

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

Currency adjusted foreign prices are matched with synchronous prices from the home market. Home news tone is the visibility-weighted average news tone across all the segments published in home newspapers for a given company *i* on day *t*. Similarly, foreign news tone is the visibility-weighted average news tone across all the segments published in foreign newspapers on the same day. Results are based on the U.S. and German companies traded in the U.S. and Germany. If there is no news reported in home or foreign markets on a given day, we assign a neutral news tone of zero (columns 1–3). In columns 4–6, we repeat results for days when news is reported in both home and foreign newspapers. Results are reported separately for the whole sample (*All*) and subsamples with high Google searches for sports; *SSA > p90* denotes days when sport search activity in the U.S. or Germany is above the 90th percentile; *SSA > p95* denotes days when sport search activity in the U.S. or Germany is above the 95th percentile. Coefficients on news tone and log visibility are multiplied by 1,000. In parentheses below the estimated coefficients are *t*-statistics with errors clustered at the trading day. The period is January 2007 through December 2016.

	(1)	(2)	(3)	(4)	(5)	(6)
	News reported at least in one country			News reported in 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

Home-country media slant and equity prices

Internet Appendix

This Internet Appendix collects supplementary material for the manuscript "Home-country media slant and equity prices." Table A.1 lists car brands for all the companies used in the main analysis. Appendix B presents a demand-based model for media slant of Mullainathan and Shleifer (2005) applied to a cross-country setting.

Table A.1
Car companies and associated brands

This table lists car companies and associated car brands included in our analysis. The period is January 2007 through December 2016. The list includes all traditional car brands and any owned by the car companies for at least half of the sample period. In addition, cars of a particular brand need to be sold in at least one of the countries analyzed, the United States, Germany, or Japan. Most brands exist throughout the whole sample period. Some brands were discontinued (Hummer, Pontiac, and Saturn in 2010, Mercury in 2011). Because General Motors does not sell cars under the GM brand, we add GM* to capture news about GM but not specific to brand. We exclude Chrysler brands from 2014 onward when Chrysler was acquired by Fiat.

American companies			German companies			Japanese companies		
General Motors	Ford	Chrysler	Volkswagen	Daimler	BMW	Toyota	Nissan	Honda
Buick	Ford	Chrysler	Audi	Mercedez-Benz	BMW	Lexus	Infiniti	Acura
Cadillac	Lincoln	Dodge	Bentley	Smart	Mini	Scion	Nissan	Honda
Chevrolet	Mercury	Jeep	Lamborghini		Rolls Royce	Toyota		
GM*		Ram	Porsche					
GMC			Seat					
Hummer			Skoda					
Opel			Volkswagen					
Pontiac								
Saturn								

Internet Appendix B

Demand-based model for media slant of Mullainathan and Shleifer (2005) applied to a cross-country setting

In the Mullainathan and Shleifer (2005) model, readers care about the truth, but they also have news-related preferences. Rational news providers thus supply news that is tilted in the direction of readers' prior beliefs. The extent of the slanting depends on the trade-off between the cost of slanting and readers' preferences for biased news. In equilibrium, the degree of slanting is determined by the difference between the published news and private signals observed by the newspapers.

The model

To apply the Mullainathan and Shleifer (2005) model to a cross-country setting, we assume two perfectly segmented markets for news: a home market and a foreign market. Readers in both markets are interested to learn about the state of a company $t \sim N(0, v_t)$. In each market, there are two newspapers competing for readers. We assume for simplicity that all newspapers receive the same signal about the company, $d = t + \varepsilon$, where $\varepsilon \sim N(0, v_\varepsilon)$. The only difference between home and foreign newspapers is that their respective readers have different preferences for news.

All readers hold prior beliefs and experience disutility when they read news that is not consistent with their prior beliefs. Even so, they dislike extreme slanting. Utility functions for home and foreign readers take the same functional form:

$$\text{Home readers: } U_h = \bar{u} - \chi s_h^2 - \phi_h (n_h - b_h)^2 - P_h . \quad \text{(B.1)}$$

$$\text{Foreign readers: } U_f = \bar{u} - \chi s_f^2 - \phi_f (n_f - b_f)^2 - P_f . \quad \text{(B.2)}$$

Here ϕ is the preference parameter for reading news that is aligned with readers' prior beliefs; b denotes such prior beliefs and n stands for reported news. The cost of slanting is denoted by χ. Newspaper's price is denoted by capital P.

As implied by the home bias in people's perceptions of companies, we assume that $b_h = \eta$ and $b_f = -\eta$, where η is an arbitrary positive number. Since people are presumably more attached to home companies than to foreign companies, we also assume that readers derive greater utility from confirmatory news on home companies then from confirmatory news on foreign companies, formally: $\phi_h > \phi_f$.

Then, in perfectly segmented markets, the optimal degrees of slant are as follows:[1]

$$\text{Home newspapers' slant: } s_h^* = \frac{\phi_h}{\chi + \phi_h}(b_h - d). \tag{B.3}$$

$$\text{Foreign newspapers' slant: } s_f^* = \frac{\phi_f}{\chi + \phi_f}(b_f - d). \tag{B.4}$$

The competition within home and foreign markets dictates that $P_h = P_f = 0$. The difference between reported news in home and foreign newspapers is equal to the difference between the two slants, and it yields a direct mapping to our empirical measurement of home-country media slant:

$$\text{Home-country media slant: } s_h^* - s_f^* = \frac{\phi_h}{\chi + \phi_h}(b_h - d) - \frac{\phi_f}{\chi + \phi_f}(b_f - d). \tag{B.5}$$

If the signal lies between the assumed priors, $b_f < d < b_h$, then both home newspapers' slant and foreign newspapers' slant contribute positively to the home-country media slant. The overall home-country media slant in Eq. (B.5) is always positive, regardless of the signal.

[1] See proposition 2 and corollary 2 in Mullainathan and Shleifer (2005).

Home-country media slant during good and bad times for companies

In catering to readers' priors, home newspapers slant the most when the signal is negative while foreign newspapers slant the most when the signal is positive. Because media consumers get higher utility from confirmatory news on home companies, $\phi_h \gg \phi_f$, home newspapers slant the news during bad times for companies more than foreign newspapers slant the news during good times for companies. As a result, the overall home-country media slant in Eq. (B.5) increases during bad times for companies.

Formally, the first derivative of home-country media slant with respect to the signal d is negative: $-\left(\phi_h - \phi_f\right)\frac{\chi}{\left(\chi+\phi_h\right)\left(\chi+\phi_f\right)}$. The larger the difference is between the preference parameters for confirmatory news, the larger the increase becomes in home-country media slant during bad times for companies. In the extreme case, when $\phi_f = 0$, only home newspapers slant the news, in which case the increase in media slant during bad times for companies is largest.

Note that we do not have to assume that all readers hold biased beliefs. As long as some readers have prior beliefs, newspapers slant the news in the presented directions. This also suggests that media slant increases in bad times for companies, even if $\phi_h = \phi_f$, as long as more home readers than foreign readers hold prior beliefs.