The Press and Local Information Advantage[*]

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Abstract

Combining a proprietary dataset of individual investor brokerage accounts with a hand-collected newspaper article dataset, we compare the use and anticipation of press information by local investors, those who live near a firm's headquarters, with non-local investors. Prior work has shown that investors tend to hold a disproportionately high level of local firm shares, and that local investors tend to perform well with these holdings. We ask whether local investors have an informational advantage created by access to local press, their anticipation of newspaper articles (local or national) or their reaction to such news. While we focus on individual investors, this study is relevant for understanding the potential informational advantages of local institutional investors and local sell-side analysts as well.

Our results show that local investors react significantly more strongly than non-local investors to local news, i.e. articles published in local or regional newspapers, even when restricting to investors who already hold the stock and are thus likely to be paying attention to firm-specific news. Non-local investors react more strongly to national newspaper articles than local investors; however the non-local investors earn on average negative returns on these trades. In essence, investors tend to react most strongly to the newspapers they are likely to subscribe to, resulting in more positive returns for local investors. We also examine anticipation of news and find no significant difference between local and non-local investors' trading. This result is inconsistent with prior literature's claim that local investor advantages are due to information leakage.

The findings in this research contribute independently to both the large literature on local biases in investing and to the growing literature on the role of the press as an information intermediary. Further, by combining these two literatures this study provides an opportunity to reflect on how each of the individual literatures are related to the broader flow of financial information in the markets.

I. Introduction

A large literature has found that investors tend to invest in local firms and that such investments generally earn above average returns (Coval and Moskowitz, 1999, 2001; Hau 2001; Kumar, 2004; Ivkovic and Weisbenner, 2005). Some papers have argued the information advantage may be driven by a "knowledge spillover" between professional in urban areas or due to general information asymmetry, but these papers have only been able to provide indirect evidence (Kumar, 2004; Goetzmann, Massa and Simonov 2004). In this paper we contribute to the local bias literature by examining one potential source of this information advantage: local print news coverage. Combining a proprietary dataset of individual investor brokerage accounts with a hand-collected newspaper article dataset, we compare the use and anticipation of press information by local investors, those who live near a firm's headquarters, with non-local investors. We ask whether local investors have an informational advantage created by access to local press, their anticipation of newspaper articles (local or national) or their reaction to such news. Our research design also allows us to examine the potential for knowledge spillover as suggested in Goetzmann et al. (2004) by examining the trading prior to management announcements and press coverage.

Our results show that local investors react significantly more strongly than non-local investors to local news, i.e. articles published in local or regional newspapers, even when restricting to investors who already hold the stock and are thus likely to be paying attention to firm-specific news. Non-local investors react more strongly to national newspaper articles than local investors; however the non-local investors earn on average negative returns on these trades. In essence, investors tend to react most strongly to the newspapers they are likely to subscribe to, resulting in more positive returns for local investors. We also examine anticipation of news and find no significant difference between local and non-local investors' trading. This result is inconsistent with prior literature's claim that local investor advantages are due to information leakage.

The findings in this research contribute independently to both the large literature on local biases in investing and to the growing literature on the role of the press as an

information intermediary. Further, by combining these two literatures this study provides an opportunity to reflect on how each of the individual literatures are related to the broader flow of financial information in the markets. While we focus on individual investors, this study is relevant for understanding the potential informational advantages of local institutional investors and local sell-side analysts as well.

II. Data

The primary data for this study include household brokerage account trading data and newspaper articles and management announcements. We also use CRSP for security returns.

We measure investor ownership and trading using a dataset of brokerage accounts for 78,000 households at a large discount brokerage firm, covering the six years from 1991 through 1996.[1] The dataset contains month-end holdings for the period. The dataset also includes each trade made within the brokerage accounts, for all securities. We restrict our analysis to common stock for US firms, excluding securities such as mutual funds, options, and American Depository Receipts. The dataset also provides the zipcode for the location of each household. Because we are interested in differences between "local" and "non-local" investors, and in both "regional" and "national" press, we need to measure distances between a household, the firm which the household is trading, and the newspapers publishing information about the firm. In order for our distance measures to be consistent across households, we restrict our investor sample to households within the continental United States. Barber and Odean (2000, 2001 and 2002) provide additional information about the brokerage account data.

We obtain firm locations from Compact Disclosure, which provides the location of company headquarters on an annual basis. We restrict the securities analyzed to common stock for firms located within the continental United States. Restricting both households and firms to those within the continental United States reduce sour sample to

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[1] We thank Terrance Odean for providing this data.

1,172,004 trades made by 42,161 households, for a total of 10,423 securities over the six years. For all locations, investor, firm and newspaper, we obtain latitudes and longitudes from the U.S. Census Bureau's Gazetteer Place and Zip code Database[2]. We then calculate distance between points a and b using a standard formula based on latitude and longitude, as

$$d_{a,b} = \left(\frac{2\pi r}{360}\right) \cos^{-1}\{\cos(lat_a)\cos(lon_a)\cos(lat_b)\cos(lon_b)$$
$$+ \cos(lat_a)\sin(lon_a)\cos(lat_b)\sin(lon_b) + \sin(lat_a)\sin(lat_b)\},$$

(1)

where latitude and longitude of points a and b are in degrees and r is the radius of the earth, approximately 3950 miles. An investor is defined as local to a particular company if they live within 250 miles of the company's headquarters.

The total database contains 54,519 firm-years with some trading data. We select 1000 firm-years for which we collect news articles. Trade activity for the 54,519 database firm-years ranges from 1 trade per year for many of the smaller securities to 4,647 trades for IBM in 1992. Local trading also varies widely, with no local trades for 42% of the firm-years in the data. We restrict the sample to firm-years for which we capture at least 5 trades. Because larger firms such as IBM have frequent news in many outlets, it can be particularly difficult to separate investor reactions to particular news sources, and investor anticipation of news articles, for firms such as IBM. In addition, local bias and the local investor informational advantage appear to be strongest for smaller stocks. Coval and Moskowitz (2001) show that local investing of mutual fund managers is strongest in small, highly levered, stocks. Ivkovic and Weisbenner (2005) show that local investor advantage is strongest in stocks not in the S&P 500. Both papers argue that local informational advantages will be strongest in smaller firms because these will be less visible to non-local investors. Thus, both to focus on the sample in which we believe local investors will have a stronger advantage, allowing us to best understand the nature

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[2] US Census Beaureau Gazateer Place and Zip Code database was accessed at: www.census.gov/geo/www/gazetteer/places.html.

of that advantage, and for practicality of collecting and analyzing news about out sample companies, we focus our analysis on small firms. We restrict the sample to firms which are in the lowest quintle of size using NYSE size breakpoints from November of the preceding year[3]. From this set of small firms with at least 5 trades in the year, we randomly select 1000 firm-years.

News articles and management announcements were collected for the 1000 firm-years from Factiva, searching through all US Newspapers for news articles and all press release wires for management announcements (press releases). Newspaper location data was purchased from Media Contacts Pro, and hand-checked against newspaper corporate website information. We define The Wall Street Journal, New York Times and USA Today as "national" newspapers, and define newspapers as "regional" if the newspaper is headquartered within 250 miles of a company's headquarters. Thus the San Fransisco Chronicle is a regional newspaper for San Fransisco Bay Area companies, and the Boston Globe is a regional paper for Boston area companies.

Table 1 provides sample statistics for newspaper articles and management announcements. As seen in Panel A, we find news for 972 of the 1000 firm-years for which we search. On average, these 972 firm-years have 11.92 newspaper articles and 10.63 management announcements, however the distribution of newspaper articles across firms is highly skewed and the median firm-year has only 5 newspaper articles. Firms tend to have coverage in both national and regional newspapers, with an average of roughly 3 articles in national newspapers and 5 in regional. The medians are again slightly lower, at 2 articles in national newspapers and 2 in regional. In addition to analyzing trading behavior around news articles and management announcements, we also focus on a subset of news for which we can more clearly attribute trading to a single news event: In particular, we focus on news (articles or announcements) with no other newspaper articles or management announcements in a (-3, +1) day window around the given news event. These are articles or announcements which are somewhat isolated in time. We find news with this characteristic for 965 of our firms. A few firms are

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[3] NYSE size cutoffs were obtained from Ken French's data library: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

eliminated because of near-daily news coverage. For these 965 firm-years, we find an average of 2.89 newspaper articles and 5.58 management announcements that are isolated within (-3, +1) day windows, with 0.67 national newspaper articles on average, and 1.49 regional articles.

Table 2 presents sample statistics for trade, both for all trading days for the 1000 firm-years and for the subset of days with news events. The top portion presents samples for all trading days. As can be seen from the first three lines, the average number of trades involving a share purchase, "buys", the average number of trades involving a share sale, "sell", and the average total number of trades, are all below 0.1. We have an average of 0.09 trades per stock-day, with a median of 0. Trades are slightly more likely to be purchases than sales. The following two lines divide trades by whether the investor is local to the given firm or non-local. Non-local investors make a larger percentage of trades, with an average of 0.06 trades per day compared to 0.02 for local investors. This is not surprising considering that many more investors are classified as non-local for any given firm.

In the final two lines we introduce an additional restriction: we limit the sample of investors to those who have a previous holding of the firm's stock, as of the prior monthly holding report. Throughout the paper, we examine trading for both the full sample of investors and the sample with prior holdings. Investors with a prior holding of a security have a specific reason to pay attention to news about the firm, even if they are non-local investors. Investors, whether local or non-local, can easily pay attention to news on the securities they hold, given the limited holdings of most of the investors in our sample: household portfolios in our dataset contain an average of 6.8 securities and a median of 4. 35% of households hold only one or two securities, and even the portfolio in the 90th percentile, in terms of number of securities, holds only 15 securities. As we can see from the table, this restriction reduces the number of trades captured by roughly one half, but we still find a non-trivial number of trades for both local and non-local investors, 0.01 and 0.03 on average, respectively.

The following four sub-sections of Table 2 show the number of buys, sells and total trades when restricting the sample of days to days on which there is a news event of some type. In all four news-event samples, trading appears to be concentrated more heavily on the news-event days. In addition, buy trades are more common on news-event days than sell trades, and a larger percentage of buy trades occurs on the news event days than sell trades. The first set of statistics shows trading on days with a newspaper article. While days with a newspaper article make up 2.42% of the days in our 1000 firm-years, trading is more heavily concentrated during these days. 6.66% of all trades occur on these 2.42% of the days. Buys are more heavily concentrated on newspaper article days than sells, at 7.34% and 5.84% respectively. Similarly, days with management announcements, which make up 3.69% of the days in the sample, contain a disproportionate number of trades, with 6.62% of all trades falling on these days. Finally, the last two subsections show trading on days that have only a national newspaper article or only a regional newspaper article. National newspaper article days seem to be associated with a slightly higher level of trade than regional newspaper article days, but both are associated with more trading than non-news days: 1.76% of trades occur on national newspaper article days, which make up 0.64% of the days in the sample, a ratio of roughly 2.8, while 3.38% of trades occur on regional newspaper article days, which make up 1.51% of the days in our sample, a ratio of roughly 2.2. The remainder of the paper will focus on trading on and around these news event days, relative to non-news days.

III. Results

Our primary tests compare local and non-local trading in response to news coveragege. They also examine the type of coverage (papers within the region of the company and those without). We then develop a further understanding of the documented trading patterns by examining the market returns to the various investors trades.

Local and Non-local Investor Trading Around News Events

In order to measure whether news impacts investor trading, we estimate ordinary least squares regressions of the following form:

$$NormalizedTrade_{i,d}^{L}$$
$$= \alpha^L + \beta_1^L I(management\ announcement)_{i,d}$$
$$+ \beta_2^L I(newspaper\ article)_{i,d} + \varepsilon_{i,d}^L,$$

(2)

where $NormalizedTrade_{i,d}^{L}$ is the total number of trades made by the set of investors L for firm i on day d, normalized by the average number of trades made by the set of investors L across all firm-days in the sample. $I(management\ announcement)_{i,d}$ is an indicator variable taking the value 1 for firm-days on which there is a management announcement made through a press release wire. $I(newspaper\ article)_{i,d}$ is an indicator variable taking the value 1 for firm-days on which there is a newspaper article pertaining to the firm. The regression is run separately for local and non-local investors, and those local and non-local investors who have holdings of the stock as of the prior month-end.

We also build upon Equation 2 by examining sub-types of newspaper articles, and by augmenting the regressions with indicators for the days preceding management announcements and newspaper articles. Examining the sub-types of newspaper articles, specifically national and regional newspaper articles, allows us to see how local and non-local investors respond differently to these sources. Including indicators for the three days prior to a management announcement or newspaper article allows us to estimate whether investors trade in advance of news events.

Table 3 presents results. Panel A shows results for all local and non-local investors, irrespective of prior ownership of the firms in question. The first column shows the relationship between local investors' trading and news events. We can see that local investors increase their trade significantly both in response to management announcements and newspaper articles. The magnitude of the trade increase is much

7

larger for newspaper articles, with trade more than tripling from non-news days. The second column shows that non-local investors similarly trade significantly more on news event days than non-news-event days, both for management announcements and newspaper articles. However the non-local investor response to newspaper articles is significantly lower than the local investor response, with the difference being statistically significant with a p-value of 0.03.

The following three columns show the reaction to three categories of newspaper articles separately: national, regional, and the remaining non-national non-regional papers. Local investors react significantly more strongly than non-local investors to regional newspaper articles. The magnitude of their reaction increase is over twice that of non-local investors, with coefficients of 1.78 and 0.74 respectively, and the difference between the two groups is statistically significant with a p-value of 0.02. However, while non-local investors trade significantly more on days of national newspaper articles and local investors do not, there is no significant difference between the two investor groups' responses. They are of similar magnitude, 1.51 and 1.80 for local and non-local investors respectively, and the difference is not statistically significant. The response to other news articles is significantly positive for both investor groups, and insignificantly different across the two groups, though higher in magnitude for local investors. All three comparisons are qualitatively similar after adding controls for the three days prior to news events, in the final three columns. Finally, looking to columns 7-9, we can see that neither group trades significantly before management announcements, but both trade significantly before newspaper articles.

Panel B shows results for the sub-sets of local and non-local investors who have prior holdings of the security, as of the prior month-end. In particular, it could be that non-local investors are reacting more weakly to regional newspaper articles simply because they are not paying as much attention to the given firms. There is a growing literature on the limited attention of investors (Barber and Odean, forthcoming). Local investors are likely to be paying more attention to local firms given the familiarity of the firms, the effects the firms may have on the community, and so on. Non-local investors would have less reason to spend a portion of their limited attention on a distant firm.

However, investors with prior holdings of the stock have a high incentive to be attentive to news on the stock, particularly given the small number of stocks held by the typical investor in our sample. However, we find that the difference between local and non-local investors reaction to regional newspapers is even larger for this sample. Non-local investors with prior holdings trade no more on the days of regional newspaper articles as on days with no news, with a statistically insignificant coefficient estimate on the regional newspaper article indicator, in column 5, of 0.47. And again, results are similar once we include indicators for the three days before news events. We do find that the gap between local and non-local investors' reaction to non-regional, non-national newspapers closes once we restrict to investors with prior holdings. The coefficients are virtually identical for these subsamples, at 1.75 and 1.84 for local and non-local investors respectively.

One difficulty in interpreting the results displayed in Table 3 is that news stories are likely to occur in clusters. For example, management may release an earnings announcement through a press release. The following day, several newspapers may cover the earnings announcement, with possibly a mix of regional, national and non-regional non-national newspapers covering the story. We may not find trading in response to the newspaper announcements because investors reacted to the initial management announcement. Or we may find differing response to the newspapers simply because of the timing of investors' trades relative to the management announcement. At the same time, if a news event is reported in only one outlet, it is likely to be a more minor news event, or less relevant to the value of the firm. In Table 4 we replicate our analysis for the subset of news events which are "clean" events, in that there is only one news story on a given day. This has the advantage of more cleanly capturing trade that is responding to a single news event, but with a reduced sample of news events.

The first three columns of Table 4 show trading reactions on single-news-event days. The second three columns show trading on single-news-event days for which there is no news event on the prior day, thus further eliminating the possibility that we are capturing delayed reactions to prior days' news. Finally, the third set of three columns shows reactions to single-news-event days with no news event in the prior three days. As

in Table 3, Panel A shows results for all local and non-local investors, while Panel B shows results for the subset of investors with prior holdings in the given securities.

Local investors react significantly more strongly than non-local investors to regional newspaper articles, both in magnitude (ranging from 1.90 to 2.75 for local investors and 0.80 to 1.48 for non-local investors) and with a statistically significant difference between the two in each of the six variations. Non-local investors consistently react more strongly than local investors to national newspaper articles when comparing the magnitudes of the coefficient estimates; with non-local investors reacting significantly to national newspaper articles in four of the six regressions and local investors reacting with negative or roughly zero coefficient estimates in all six specifications. However the significance of the difference between the two groups' reactions to national news varies. The difference between the two is statistically significant for those single-news-event days with no news in the prior three days, however the difference is insignificant if we only restrict the sample to those with no news events on the prior day, or if we make no restriction on prior news. Finally, both groups react significantly to non-regional non-national newspaper articles when we do not restrict the sample based on prior ownership. When we require prior ownership, we find that non-local investors react more strongly to these other newspaper articles than local investors, significantly so if we require no news events on the prior day or in the prior three days. In all six variations using management announcements (rather than press coverage), both local and non-local investors react significantly to the management announcements, but with no significant difference between the two groups' reactions.

Overall, we can see from both Tables 3 and 4 that local investors react significantly more strongly to regional newspaper articles than non-local investors, while non-local investors react more strongly to national newspaper articles than local investors, particularly when those national newspaper articles are "isolated," in the sense of being the only news story on a given day, and having no other news about the firm in the prior three days.

A natural question, then, is whether investors profit based on their response to news. In particular, we might think that regional news stories are more often "picked up" by national newspapers in following days. And national stories which are isolated may be more likely to be interest pieces or stale news than to be new information.

Returns Following Local and Non-local Investor Purchases Around News Events

In order to analyze return differences following the trading of local and non-local investors, we focus on whether a given investor group, local, non-local and local and non-local with prior holdings, is a net buyer of the stock on a given day: Do investors of the given group buy more shares than they sell? We define an indicator variable, "Net Buy Indicator," for each investor group, which takes the value 1 if the given investor group was a net buyer for stock i on day d. Table 5, Panel A, provides sample statistics for the Net Buy Indicator variables. The correlation between local and non-local investors' net buying is in fact quite low, at 0.06, allowing us to clearly measure differences in the returns predicted by local and non-local investors' trading.

We then estimate regressions of the form

$$R_{i,(d+1,d+63)} = \alpha_{i,d} + \beta_{i,d}^{local}I(local\ net\ buying)_{i,d}$$
$$+ \beta_{i,d}^{nonlocal}I(nonlocal\ net\ buying)_{i,d} + \varepsilon_{i,d},$$

(3)

where $R_{i,(d+1,d+63)}$ is the return for firm i over the three months covering days $d+1$ through $d+63$, $I(local\ net\ buying)_{i,d}$ is the "Net Buy Indicator" for local investors for firm i, and day d, and $I(nonlocal\ net\ buying)_{i,d}$ is the "Net Buy Indicator" for non-local investors. Equation 3 captures whether returns vary positively or negatively with the net buying of each type of investor group. We estimate Equation 3 separately for the event-days of interest: days with management announcements, regional newspaper articles and national newspaper articles. A variation of Equation 3 is also estimated using the net buying of local and non-local investors with prior holdings to define the net buying indicators, rather than the net buying of all local and non-local investors.

11

Panel B presents results for all three types of news event days, while Panel C presents results for "clean" news event days of each type, which are single-news-event dates with no other news in the preceding 3 days. Looking first to days with management announcements: We can see that there is a negative relationship between future returns and net buying of both local and non-local investors. For local and non-local investors with prior holdings, the coefficient estimates are negative and of similar magnitude, but insignificant. For "clean" management announcement dates, i.e. those that are the only news event on the given day, and that are preceded by at least three days with no news events, we find again that both local and non-local investors' net buying predicts negative returns. For local investors with prior holdings, the coefficient estimate is again negative but insignificant, however for non-local investors with prior holdings the coefficient estimate is positive, around zero, and insignificant. Overall, it appears that local and non-local investors tend to be net buyers of firms with more negative future returns on management announcement days, though investors with prior holdings fare less badly.

Turning to the third and fourth columns, and the relationship between returns and net buying for regional news article dates, we find a significant difference between local and non-local investors. Both for all regional newspaper article days and for "clean" regional newspaper article days, we find that local investor net buying predicts insignificantly more positive returns, while non-local net buying predicts significantly more negative future returns. The difference between the two groups is strongly significant, and of large magnitude: 8.3% and 14.0% over the three months following the news events for all news and "clean" news respectively. The difference is of similar magnitude for local and non-local investors with prior holdings, however the differences are not statistically significant for these subsamples. The buying of local investors with prior holdings is related to insignificantly more positive future returns while the net buying of non-local investors is related to significantly more negative future returns.

Finally, turning to columns five and six, we can see that there is a significant difference in the relationship between future returns and local and non-local net buying around national newspaper articles. We saw in Tables 3 and 4 that non-local investors react significantly more strongly to national news than local investors. However, we can

see from column five that non-local investors' net buying on national news days predicts significantly more negative future returns. In contrast, local net buying predicts insignificantly negative returns for national news days, of much smaller magnitude, and significantly positive returns for "clean" national news days. It is important to note that the sample of "clean" national news days is fairly small, at only 609, because a larger percentage of national news is accompanied by other news on the same day or in the prior three days, than for either regional news articles or management announcements. However, the results are qualitatively similar for both the "clean" national news sample and the full national news sample. Looking to column six, local investors with prior holdings seem to do similarly better than non-local investors with prior holdings around national news articles. Prior-holding local investor net buying has a positive insignificant relation with future returns while non-local investors net buying has a significantly negative relation. The difference between the two is strongly significant, and amounts to an 18% difference in returns. The difference is again even larger when we restrict to the sample of national news event days with no other news on the same day or in the three days before the news article date. Results are similar if we simply examine the mean and median returns of local and non-local net buy firms and do not appear to be driven by any few observations.

Overall, we find that the net buying of local investors has more positive predictive power for future returns than the net buying of non-local investors, for both regional and national newspaper articles. So while non-local investors do respond more strongly to national newspaper articles than local investors, this response may not be profitable. In contrast, the stronger response of local investors to regional newspaper articles may lead to higher returns for the local investors.

Differentiating Between "Big" News Stories and "Little" News Stories

Local investors display an advantage in their local investing decisions and, more specifically, in their trading around news events. Our results show that the advantage remains almost identical when we limit investors to those who already have holdings of a given stock, and are likely to be paying attention to the firm as a result. Thus limited

13

attention does not appear to be the driver of the local investor advantage. In this subsection we investigate another possible dimension of the local investor advantage. In particular, local investors may be better able to evaluate which stories are important for the firm, and which are not. We can proxy for the significance of a given story by whether it is "picked up" in future press articles or not. For example, a significant management announcement pertaining to unexpected layoffs or a large new contract is likely to be "picked up" in national newspapers on the following day, while a local interest piece about a plant worker which appears in a regional newspaper is unlikely to be picked up.

In order to test whether local and non-local investors respond differently to those articles which are later picked up, we focus on the sub-set of "clean" news events, which are the only news event on a given day and which are preceded by at least three days with no news. We then separate this sample into two groups based on whether there is a newspaper article in the following two days. The set of "clean" news events which are followed by a newspaper article in the following two days are more likely to be news stories which were "picked up" while those that are not followed by any other news story in the following two days are unlikely to be "picked up."

Table 6 shows the trading responses of local and non-local investors to these news events. Panel A shows the response of all local and non-local investors, while Panel B shows the responses of investors with prior holdings of the stocks in question. The first three columns of each panel show the local and non-local investor trading around "clean" news events with no newspaper article in the following two days, i.e. those that are not picked up, as well as statistics for tests of the difference between local and non-local trading. The fourth through sixth columns show the responses and difference for "clean" news events with at least one newspaper article in the following two days, i.e. those that are picked up. Finally, column seven shows statistics for testing the difference in local trading to articles which are not picked up compared to those that are, i.e. comparing the results in columns one and four. Column eight similarly shows statistics for the difference for non-local investors. We find very few reaction differences which are significant both when comparing local and non-local investors, and when comparing a given investor

14

groups' response to "picked-up" and "not picked-up" articles. Non-local investors respond more strongly to regional articles which are subsequently picked up: they respond more strongly than local investors, and respond more strongly to management announcements which are picked up than to those which are not. The differences reduce in significance for the sub-sample with prior holdings, with p-values of 11% and 14%, respectively. When comparing investors with prior holdings, local investors respond more strongly to regional newspaper articles which are not picked up, again both in comparison to non-local investors and to regional articles which are picked up. Overall, we find very little consistent difference between the two groups, and no evidence that local investors' advantage is in reacting more to "bigger" news, as measured by whether an article is followed by additional articles in the following two days. If anything, local investors seem to respond more to news stories which appear in regional newspapers and which are not subsequently followed by additional articles.

IV. Conclusion

In this paper we contribute to the established literature on local bias in investing and the growing literature on the role of the press in financial markets by examining retail investors' trades in response to press coverage. We show that retail investors are more likely to respond to local press coverage and that their response is generally consistent with earning positive returns. Conversely, non-local investors tend only to respond to national press coverage and generally experience negative returns from these trades. We show that these results are not simple due to increased visibility of the firm for local investors, suggesting that there is a systematic difference in the use of information.

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Table 1. Newspaper and Management Announcement Sample Statistics

Panel A. All News

	Total, Full Sample	Firm-Years	Mean	Standard Deviation	25th percentile	Median	75th percentile	95th percentile	max
Newspaper articles	11,631	972	11.97	49.47	2	5	11	33	1,381
Management Announcements	10,329	972	10.63	8.99	5	9	14	26	91
Articles in National Newspapers [a]	2,836	972	2.92	4.65	0	2	4	10	80
Articles in Regional Newspapers [b]	4,901	972	5.04	10.87	0	2	6	19	171

a. National newspapers are defined as: New York Times, Wall Street Journal, and USA Today
b. Regional newspapers are defined as papers headquartered within 250 miles of the company's headquarters. Thus the "Regional" papers for each firm differ based on the firm's location.

Panel B. News with no other newspaper articles or management announcements in a (-3, +1) day window

	Total, Full Sample	Firm-Years	Mean	Standard Deviation	25th percentile	Median	75th percentile	95th percentile	max
Newspaper articles	2,787	965	2.89	3.47	0	2	4	10	25
Management Announcements	5,381	965	5.58	4.23	2	5	8	13	24
Articles in National Newspapers [a]	649	965	0.67	1.11	0	0	1	3	7
Articles in Regional Newspapers [b]	1,435	965	1.49	2.51	0	1	2	6	24

a. National newspapers are defined as: New York Times, Wall Street Journal, and USA Today
b. Regional newspapers are defined as papers headquartered within 250 miles of the company's headquarters. Thus the "Regional" papers for each firm differ based on the firm's location.

Table 2. Trading Sample Statistics

This table presents sample statistics for the trading of all continental US investors in our brokerage house database, for all of their stock trades on firms with continental-US headquarters. Local and non-local investors are defined based on the distance between the investor's home and the headquarters of the firm. Investors who are within 250 miles of a firm are defined as local, and all others as non-local. Previous holdings indicates whether the given investor held shares of the company's stock as of the end of the prior calendar month.

	Percentage of trades [a]	mean	standard deviation	median	95th percentile	max
All trading days (for the 1000 firm-years)						
N=245,712						
buys		0.05	0.32	0	0	50
sells		0.04	0.24	0	0	12
All trades		0.09	0.44	0	1	60
Trades by local investors		0.02	0.18	0	0	15
Trades by non-local investors		0.06	0.36	0	1	45
Trades by local investors with previous holdings		0.01	0.11	0	0	9
Trades by non-local investors with previous holdings		0.03	0.19	0	0	9
Trading days with a newspaper article						
N=5,953, 2.42% of days						
buys	7.34%	0.14	0.96	0	1	50
sells	5.84%	0.10	0.44	0	1	10
All trades	6.66%	0.24	1.22	0	1	60
Trading days with a management announcement						
N=9,071, 3.69% of days						
buys	6.94%	0.09	0.79	0	1	50
sells	6.25%	0.07	0.40	0	0	11
All trades	6.62%	0.16	1.05	0	1	60
Trading days with only National newspaper articles [b]						
N=1,583, 0.64% of days						
buys	2.01%	0.15	0.94	0	1	30
sells	1.47%	0.09	0.44	0	1	8
All trades	1.76%	0.24	1.22	0	1	34
Trading days with only Regional newspaper articles [c]						
N=3,709, 1.51% of days						
buys	3.68%	0.11	0.69	0	1	30
sells	3.03%	0.08	0.40	0	1	8
All trades	3.38%	0.19	0.92	0	1	34

a. "Percentage of trades" shows the percentage of the number of the given type of trade (buy, sell, or any trade) that occurs on the given type of trading day, relative to the number that occurs during any of the trading days for the 1000 firm-years.
b. Trading days on which there is at least one National newspaper article, but zero Regional newspaper articles and zero management announcements
c. Trading days on which there is at least one Regional newspaper article, but zero National newspaper articles and zero management announcements

Table 3. Trading Response of Local and Non-local Investors to Management Announcements and Newspaper Articles

This table presents results from estimating ordinary least square regressions, seperately for "local" and "non-local" investors, on the investors' trade reactions to news. The dependent variable is total trade for the given stock-day for the given investors, normalized by total trade across the entire sample of stock-days, for the given investors, to allow for direct comparability across investor groups. T-statistics are given below coefficients. * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors are robust to heteroskedasticity and arbitrary within-firm-year correlation.

The "Difference" column presents chi-square and p-value on the difference between the estimates in the local and non-local columns (where the two regressions are estimated using seemingly unrelated estimation to control for cross-correlation).

Panel A: Trading for all local and non-local investors

	local	non-local	Difference, chi2 and p-value	local	non-local	Difference, chi2 and p-value	local	non-local	Difference, chi2 and p-value
I(management announcement)	0.8286	0.7771	0.08	0.8199	0.7732	0.07	0.8659	0.8099	0.09
	2.70***	2.47**	0.7759	2.73***	2.50**	0.7941	2.78***	2.54**	0.759
I(newspaper article)	2.3137	1.575	4.75						
	3.46***	2.80***	0.0293						
I(regional newspaper article)				1.7791	0.7428	5.55	1.8203	0.7757	5.57
				3.86***	2.38**	0.0185	3.91***	2.42**	0.0183
I(national newspaper article)				1.5161	1.8037	0.28	1.5184	1.8054	0.28
				1.44	2.42**	0.5939	1.44	2.42**	0.5945
I(non-regional, non-national newspaper article)				2.6961	1.8525	1.33	2.7347	1.8834	1.34
				2.00**	1.86*	0.2497	2.01**	1.88*	0.2478
I(three days prior to a management announcement)							0.1843	0.125	0.41
							1.6	1.58	0.5199
I(three days prior to a newspaper article)							0.8235	0.6906	0.58
							4.14***	3.94***	0.4452
Constant	0.9134	0.9332	0.25	0.9046	0.9287	0.37	0.8567	0.8904	0.76
	21.24***	25.00***	0.6144	21.11***	25.18***	0.5405	20.03***	24.22***	0.3839
Observations	245,712	245,712		245,712	245,712		245,712	245,712	
R-squared	0.0023	0.0025		0.0032	0.0035		0.0037	0.0041	

Panel B: Trading for local and non-local investors with holdings in the given stock as of the prior month-end

	local	non-local	Difference, chi2 and p-value	local	non-local	Difference, chi2 and p-value	local	non-local	Difference, chi2 and p-value
I(management announcement)	0.7933	0.7555	0.05	0.7874	0.7534	0.04	0.8392	0.7994	0.05
	2.57**	2.52**	0.8249	2.58***	2.54**	0.8419	2.63***	2.55**	0.8171
I(newspaper article)	2.2258	1.4917	3.46						
	2.65***	1.94*	0.0627						
I(regional newspaper article)				1.7752	0.4659	3.31	1.8216	0.5071	3.31
				2.77***	0.99	0.0689	2.82***	1.05	0.0687
I(national newspaper article)				1.5972	1.9714	0.12	1.5997	1.9736	0.12
				1.07	2.84***	0.73	1.07	2.84***	0.7302
I(non-regional, non-national newspaper article)				1.7553	1.8373	0.04	1.7988	1.8761	0.03
				1.46	1.68*	0.85	1.48	1.69*	0.8592
I(three days prior to a management announcement)							0.1921	0.1583	0.07
							1.17	1.28	0.7886
I(three days prior to a newspaper article)							0.9493	0.8639	0.13
							3.31***	2.97***	0.7163
Constant	0.9168	0.936	0.13	0.9122	0.933	0.15	0.8583	0.8851	0.26
	17.68***	20.31***	0.7184	17.80***	20.59***	0.6965	17.37***	20.84***	0.6068
Observations	245,712	245,712		245,712	245,712		245,712	245,712	
R-squared	0.001	0.0013		0.0013	0.0018		0.0015	0.0024	

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4. Trading Response of Local and Non-local Investors to Management Announcements and Newspaper Articles, for "clean" events

This table presents results from estimating ordinary least square regressions, seperately for "local" and "non-local" investors, on the investors' trade reactions to news. In columns 1-3 the sample is limited to firm-days on which there is only a single news event for the given firm (i.e. a single news article or management announcement). In columns 4-6, the sample is further restricted to single news event days with no news event for the given firm on the prior day. And in columns 7-9 the sample is restricted to single news event days in which there is no news event for the given firm in the prior three days. The dependent variable is total trade for the given stock-day for the given investors, normalized by total trade across the entire sample of stock-days, for the given investors, to allow for direct comparability across investor groups. T-statistics are given below coefficients. * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors are robust to heteroskedasticity and arbitrary within-firm-year correlation.

The "Difference" column presents chi-square and p-value on the difference between the estimates in the local and non-local columns (where the two regressions are estimated using seemingly unrelated estimation to control for cross-correlation).

Panel A: Trading for all local and non-local investors

	All single-news-event days			Single-news-event days with no news event on the prior day			Single-news-event days with no news event in the prior three days		
	local	non-local	Difference, chi2 and p-value	local	non-local	Difference, chi2 and p-value	local	non-local	Difference, chi2 and p-value
I(management announcement)	1.3066	1.4437	1.08	1.2431	1.3974	1.38	1.2585	1.3608	0.6
	9.00***	9.61***	0.2979	9.99***	11.41***	0.2396	10.01***	12.41***	0.438
I(regional newspaper article)	2.5083	1.4848	6.21	2.0043	1.4427	1.87	1.9069	1.1952	2.79
	6.08***	6.63***	0.0127	4.98***	6.10***	0.1714	4.33***	6.43***	0.0951
I(national newspaper article)	0.4181	1.2317	2.41	0.1378	0.8265	1.46	0.028	1.2341	3.71
	0.6	2.56**	0.1208	0.21	1.56	0.2264	0.03	1.78*	0.0539
I(non-regional, non-national newspaper article)	2.2336	2.3538	0.07	1.7488	2.3533	1.93	1.5519	2.3605	2.52
	3.68***	5.46***	0.7931	3.73***	5.33***	0.1645	3.45***	6.95***	0.1127
Observations	12,402	12,402		10,350	10,350		9,081	9,081	
R-squared	0.0229	0.0382		0.0201	0.0358		0.0182	0.0334	

Panel B: Trading for local and non-local investors with holdings in the given stock as of the prior month-end

	All single-news-event days			Single-news-event days with no news event on the prior day			Single-news-event days with no news event in the prior three days		
	local	non-local	Difference, chi2 and p-value	local	non-local	Difference, chi2 and p-value	local	non-local	Difference, chi2 and p-value
I(management announcement)	1.3164	1.5159	1.09	1.2748	1.4888	1.27	1.2598	1.4203	0.71
	6.95***	7.24***	0.297	7.29***	8.51***	0.2603	7.24***	9.74***	0.4003
I(regional newspaper article)	2.7568	1.1975	4.72	2.6662	1.1945	2.88	2.7291	0.802	4.11
	4.07***	3.36***	0.0298	3.29***	3.12***	0.0899	2.94***	4.01***	0.0427
I(national newspaper article)	0.2655	1.447	1.54	-0.6462	0.5699	1.43	-1.1906	0.9112	3.32
	0.25	2.72***	0.2148	0.69	1.07	0.2325	1.11	1.73*	0.0686
I(non-regional, non-national newspaper article)	1.8314	2.6575	2.04	1.1274	2.7621	7.16	0.7118	2.6953	7.77
	2.94***	3.29***	0.1537	2.47**	3.56***	0.0074	1.90*	4.56***	0.0053
Observations	12,402	12,402		10,350	10,350		9,081	9,081	
R-squared	0.0102	0.0253		0.0101	0.0244		0.0092	0.0234	

Table 5. Returns Differences for Local and Non-local Investor Reactions to News

"Net Buy Indicator" is an indicator, defined for each stock-day, for whether the net dollar trades made by the given investor group are positive - i.e. whether they are net buyers on the given day. Panel A presents sample statistics for the "Net Buy Indicator" while Panels B and C present results from estimating ordinary least squares regressions of future returns on trade characteristics on news event days. The dependent variable in Panels B and C is raw return over days 1 through 63 (3 months) following the given news event day. "Clean" news event days in Panel C are days on which there is only one management announcement or newspaper article, and there are no management announcements or newspaper articles in the prior 3 days. * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors are robust to heteroskedasticity and arbitrary within-firm-year correlation.

Panel A. Sample Statistics, Net Buy Indicator

| | | | | correlation with: | | |
| | | | | local investors | non-local investors | local investors with prior holding |
	mean	std. dev.	median			
local investors	0.0100	0.0997	0			
non-local investors	0.0265	0.1606	0	0.0591		
local investors with prior holding	0.0023	0.0480	0	0.4736	0.0242	
non-local investors with prior holding	0.0056	0.0749	0	0.0284	0.4529	0.0201

Panel B. Regressions of Future Returns on Net Buy Indicators: All News Event Days

	days with management announcement		days with regional newspaper article		days with national newspaper article	
local investors	-0.0437		0.0065		-0.015	
	1.65*		0.23		0.35	
non-local investors	-0.0503		-0.0768		-0.0815	
	2.52**		3.33***		3.01***	
local investors with prior holding		-0.0516		0.012		0.0766
		0.97		0.24		1.36
non-local investors with prior holding		-0.0402		-0.0745		-0.1052
		0.77		2.03**		2.35**
constant	0.0873	0.0853	0.0653	0.0618	0.0652	0.06
	11.25***	11.14***	6.42***	6.01***	5.77***	5.35***
Observations	8983	8983	4353	4353	2096	2096
R-squared	0.001	0.0002	0.0026	0.0005	0.0034	0.0015
Difference between local and non-local investor coefficients:	0.0066	-0.0114	0.0833	0.0865	0.0665	0.1818
	0.20	-0.15	2.28	1.39	1.31	2.53

Panel C. Regressions of Future Returns on Net Buy Indicators: "Clean" News Event Days

	days with management announcement		days with regional newspaper article		days with national newspaper article	
local investors	-0.069		0.0122		0.1236	
	1.94*		0.28		1.85*	
non-local investors	-0.0326		-0.1281		-0.1838	
	1.67*		3.39***		3.08***	
local investors with prior holding		-0.1181		0.082		0.335
		1.48		1.1		6.43***
non-local investors with prior holding		0.0085		-0.0889		-0.0644
		0.16		0.96		0.41
constant	0.0883	0.0866	0.071	0.0656	0.0655	0.0549
	11.09***	11.11***	5.48***	5.16***	3.51***	3.01***
Observations	6723	6723	1536	1536	609	609
R-squared	0.0007	0.0003	0.0053	0.0007	0.0155	0.0044
Difference between local and non-local investor coefficients:	-0.0364	-0.1266	0.1403	0.1709	0.3074	0.3994
	-0.90	-1.32	2.43	1.44	3.43	2.41

Table 6. Trading Response of Local and Non-local Investors to Management Announcements and Newspaper Articles, seperated by future newspaper articles (i.e. whether the story is "picked up")

This table presents results from estimating ordinary least square regressions, seperately for "local" and "non-local" investors, on the investors' trade reactions to news. The sample is limited to days on which there is only one management announcement or newspaper article, and which have had no management announcements or newspaper articles in the preceding three days. (i.e. last 3 columns in Table 4. Single news event days). The dependent variable is total trade for the given stock-day for the given investors, normalized by total trade across the entire sample of stock-days, for the given investors, to allow for direct comparability across investor groups. T-statistics are given below coefficients. * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors are robust to heteroskedasticity and arbitrary within-firm-year correlation.

The "Difference" column presents chi-square and p-value on the difference between the estimates in the local and non-local columns (where the two regressions are estimated using seemingly unrelated estimation to control for cross-correlation).

Panel A: Trading for all local and non-local investors

	No newspaper article in following 2 days		Difference, chi2 and p-value	Atleast one newspaper article in following 2 days		Difference, chi2 and p-value	Difference for each investor type, between news and no-news samples:	
	local	non-local		local	non-local		local	non-local
I(management announcement)	1.2773	1.2145	0.18	1.1913	1.8825	7.31	0.1	5.4
	8.92***	11.49***	0.6734	4.99***	6.67***	0.0068	0.7522	0.0202
I(regional newspaper article)	2.0407	1.0711	4.25	1.0545	1.9858	1.53	1.89	2.57
	4.15***	5.54***	0.0392	1.82*	3.64***	0.2158	0.1695	0.1089
I(national newspaper article)	-0.0134	1.3793	4.23	-0.1687	0.2035	0.07	0.01	0.7
	0.01	1.85*	0.0398	0.16	0.17	0.7916	0.9116	0.4016
I(non-regional, non-national newspaper article)	1.4833	2.3196	2.22	1.9256	2.5838	0.42	0.22	0.11
	2.89***	6.99***	0.1361	2.42**	3.09***	0.5172	0.6416	0.745
Observations	7,303	7,303		1,778	1,778			
R-squared	0.018	0.0324		0.0207	0.0399			

Panel B: Trading for local and non-local investors with holdings in the given stock as of the prior month-end

	No newspaper article in following 2 days			Atleast one newspaper article in following 2 days			Difference for each investor type, between news and no-news samples:	
	local	non-local	Difference, chi2 and p-value	local	non-local	Difference, chi2 and p-value	local	non-local
I(management announcement)	1.2744	1.3157	0.03	1.2077	1.7932	2.6	0.03	2.15
	6.49***	8.79***	0.8519	3.45***	5.68***	0.1067	0.8657	0.1421
I(regional newspaper article)	3.0257	0.586	5.42	0.8384	2.1785	0.99	3.63	2.23
	2.93***	3.27***	0.02	1.02	2.10**	0.3205	0.0569	0.1353
I(national newspaper article)	-1.5379	0.9328	3.9	1.2744	1.7428	0.02	1.22	0.09
	1.3	1.83*	0.0482	0.56	0.65	0.8791	0.2686	0.7665
I(non-regional, non-national newspaper article)	0.5054	2.6893	10.59	1.8372	2.7279	0.2	1	0
	1.34	4.92***	0.0011	1.44	1.86*	0.6554	0.3169	0.977
Observations	7,303	7,303		1,778	1,778			
R-squared	0.0094	0.022		0.0103	0.0316			