10-2014

Leveling the Playing Field: Financial Regulation and Disappearing Local Bias of Institutional Investors

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March 16, 2015

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*We thank Anup Agrawal, Warren Bailey, Scott Bauguess, Vidhi Chhaochharia, Larry Fauver, Rocco Huang, George Korniotis, S. P. Kothari, Kelvin Law, Evgeny Lyandres, Tony Ruan, Kumar Venkataraman, Wei Wang, Peter Wysocki, Scott Yonker, and seminar participants at Hong Kong University of Science and Technology, Melbourne University, Nanyang Technological University, National University of Singapore, Singapore Management University, Southern Methodist University, University of Miami, University of New South Wales, University of Tennessee, U.S. Securities and Exchange Commission (SEC), and 22nd Annual Conference on Financial Economics and Accounting, 2012 China International Conference in Finance (Chongqing), and 2012 European Finance Association (Copenhagen) meetings for helpful comments and valuable suggestions. We are very grateful to Jefferson Duarte and Lance Young for allowing us to use their PIN decomposition data, and Hongping Tan for sharing the analyst location data. We also thank the Financial Markets Research Center at Vanderbilt University for providing the effective spread data. Please address all correspondence to Johan Sulaeman, Department of Finance, NUS Business School, National University of Singapore, 15 Kent Ridge Drive, Singapore 119245; telephone: (65) 6516 1403. E-mail: sulaeman@nus.edu.sg. Alok Kumar can be reached at 305-284-1882 or akumar@miami.edu. Gennaro Bernile can be reached at +65-68085478 or gbernile@smu.edu.sg.

Leveling the Playing Field: Disclosure Regulation and Local Informational Advantage

Abstract – This study examines how changes in firms' information environment affect local agents. We show that local bias and informational advantage of institutional investors and equity analysts located around corporate headquarters decline sharply following the adoption of Regulation Fair Disclosure and Sarbanes-Oxley Act. The decline in local bias is more salient among firms whose information environment is more opaque before the new rules. At the aggregate market level, the degree of informed trading attributed to local investors also declines. Overall, the evidence is consistent with disclosure regulation affecting the informational advantage that market participants enjoy due to their proximity to firms.

Keywords: disclosure regulation; Reg FD; Sarbanes-Oxley; local bias; local performance; institutional investors; equity analysts

1. Introduction

Existing studies show that geographic proximity affects the behavior and performance of local capital market participants. Coval and Moskowitz (1999, 2001) find that U.S. institutional investors hold a disproportionate fraction of the equity of firms headquartered locally and earn higher returns on these local investments.[1] In a similar vein, Malloy (2005) finds that analysts located near firm headquarters have an informational advantage. Local capital market participants may have personal contacts with the firm management, directly inspect local firms, or acquire information about local firms' operations. They may also have access to information from other local sources (e.g., customers, suppliers, social networks, and news media) at a lower cost. The information advantage of local agents, however, should depend on the firms' information environment. In particular, a less competitive and transparent information environment provides more opportunities for local agents to obtain and exploit valuable information.

Disclosure regulation is a fundamental determinant of the quality and competitiveness of firms' information environment. In this study, we examine whether changes in U.S. disclosure rules around the turn of the millennium affect the behavior and performance of local capital market participants. Regulation Fair Disclosure (Reg FD) and the Sarbanes-Oxley Act (SOX), in particular, generate large exogenous shocks to the information environment of U.S. publicly-traded firms. The new rules aim at curbing selective access to corporate information and improving the reliability of corporate financial reports. If the local bias and superior local performance of capital market participants depend on firms' information environment, we expect that both would decline following the enactment of rules that aim to improve the competitiveness and quality of the environment.[2]

In the first part of our analysis, we examine the quarterly portfolio holdings of 13(f) institutions during the 1996 to 2008 period. Consistent with our conjecture that the local bias of institutional investors would decline in the more competitive information environment of the new regulatory regime, there is a discrete 50% drop in the excess local holdings of institutional

[1] This evidence extends prior studies conducted in international settings, e.g., Tesar and Werner (1995).

[2] Reg FD aimed to "level the playing field" among different types of investors by curbing firms' practice of allowing access to corporate information to selected market participants ahead of its public disclosure. The new rules mandated the disclosure of all material information to all investors at the same time. SOX mandated the implementation of new rules for financial reporting aiming to improve its transparency, reliability, and accountability. In particular, SOX addressed issues such as enhanced internal controls over financial reporting, auditor independence, and corporate governance (Coates (2007)).

investors around the enactment of the new rules. The average excess local institutional ownership is stable at around 8% in the pre-regulation years (1996-1999). Then, it drops sharply and stabilizes at around 4% in the new regulatory regime.

Next, to assess the effect of the new rules on investors' incentives to focus on local firms, we examine whether the relation between firms' information environment and investors' local bias varies with the disclosure regulation regime. We find that while a firm's excess local ownership decreases with the quality of its information environment prior to the new rules, this relation becomes significantly weaker in the new regime. This is consistent with the notion that the new disclosure rules curb local investors' informational advantage.

To more directly establish that the causal direction is from firm-level information environment to local institutional ownership in the old regime, we estimate a series of difference-in-difference regressions. In particular, we hypothesize that the impact of the new rules on local institutional ownership is larger for firms that operated in less transparent and less competitive information environments *prior* to the regulatory changes. Consistent with this prediction, we find that the firm-level declines in local ownership following the regulatory changes are more pronounced among firms with large discretionary accruals, no major auditor, high skewness, and no analyst coverage prior to the new rules.

To complement the investor bias analysis, we also investigate whether the ability of institutional investors to earn abnormal returns from local investments changes around the new rules. A corollary of our argument is that local investors' abnormal performance would decline in the post-regulation environment. The empirical evidence is consistent with this prediction. While institutional investors earn higher returns in local stocks relative to non-local stocks in the pre-regulation period, they appear to have no such local informational advantage in the post-regulation period.

In the second part of the paper, we shift our focus to sell-side equity analysts located around corporate headquarters. As recognized by the SEC in the final ruling adopting Reg FD (Release No. 33-7881), these analysts were the most likely beneficiaries of selective access to firm management. Consistent with this view, Malloy (2005) documents that analysts have relatively superior information about local firms using a sample that largely consists of pre-Reg FD years. Given the curtailing of selective access to corporate information in the new regulatory regime, we expect the time-series patterns of geographic variation in analyst coverage and performance

around the new rules to resemble the patterns observed for institutional investors.

Consistent with this conjecture, we document significant secular shifts in local analysts' behavior and performance. First, similar to local institutional investors, we find that there is a significant decline in the local coverage bias of sell-side equity analysts following the new rules. The excess coverage of U.S. firms by local equity analysts declines by approximately 40% in the new regulatory regime. Second, a concomitant decrease of local analysts' information advantage accompanies the reduction in the local analyst bias. Although local analysts display significantly higher forecast accuracy prior to the new rules, such informational advantage is greatly reduced – and in fact disappears – in the new regulatory regime.

Overall, our results support the notion that the quality and competitiveness of firms' information environments affect local capital market participants' behavior and performance. Prior to Reg FD and SOX, agents focus on local stocks for which they are likely to enjoy a competitive advantage in gathering and processing information. Following the new rules aimed at leveling the information playing field, the informational advantage of local agents disappears and their bias toward local firms is greatly reduced.[3]

In the last part of the paper, we examine the implications of our main findings for aggregate capital market outcomes. In particular, we test whether the enactment of the new rules changes the relation between market-wide measures of informed trading and institutional investors' local bias. If investors as a group recognize the increased quality and competitiveness of the information environment, we expect that the relation between market-wide measures of adverse selection and excess local ownership would be weaker in the new regulatory regime.

To conduct our tests, we use two different market-based measures of informed trading. First, using the probability of informed trading (PIN) decomposition proposed in Duarte and Young (2009), we find a strong positive relation between the adverse selection component of PIN (i.e., adjusted PIN) and local investor bias prior to the new rules. This relation, however, becomes weaker following the regulatory changes. By contrast, the relation between local bias and the

[3]The documented patterns in investor and analyst local bias seem inconsistent with alternative explanations that rely on secular time-series patterns in technological advancement. In particular, such technology-induced secular trends (e.g., cheaper access to the Internet in the mid-90's, launch of the SEC's EDGAR system in 1996) would have started earlier and continued in the later part of our sample period. Similarly, it is hard to explain why a trend in analyst and investor preferences would suddenly stop and coincide with the regulatory changes. Relatedly, we show that our findings do not reflect the changing preferences of institutional investors during the rise and fall of the technology sector around the year 2000.

liquidity component of PIN (i.e., the estimated probability of symmetric order flow shocks) remains strongly positive and significant throughout our sample period. This evidence suggests that, while their role as liquidity providers (see Shive (2012)) is not affected, local investors' ability to engage in information-based trading decreases after the new rules.

Second, because the PIN-decomposition data only span a short period following the new rules, we conduct similar tests using effective trading spreads instead, which prior studies suggest are directly related to the adverse selection component of stock prices (e.g., Eleswarapu, Thompson, and Venkataraman (2004)). We find that there is a strong positive relation between local bias and subsequent trading spreads prior to the new rules, again consistent with a local informational advantage. However, the local bias-spread relation becomes significantly weaker in the new regulation regime. Moreover, this decline is most pronounced outside of earnings announcement windows, when access to local information would be most valuable.

In our last set of tests, we extend the spread-based analysis by zooming in on earnings announcements to identify whether selective access to private information or superior processing of public information drives the local informational advantage prior to the new rules. If the local advantage prior to the new rules stems from selective access, we expect that the pre-announcement local bias-spreads relation would be most affected in the new regime. Alternatively, we expect that the post-announcement local bias-spreads relation would be most affected if the local advantage prior to the new rules stems from superior processing. We find that, prior to the new rules, the local bias-spreads relation is positive and similar in magnitude during earnings pre- and post-announcement windows. In the new regime, however, the pre-announcement local bias-spreads relation becomes significantly weaker, whereas the post-announcement relation is virtually unaffected. This evidence suggests that the new rules at the turn of the millennium may have affected local agents' behavior and performance mostly through the curtailment of selective access to corporate information.

Collectively, our findings make significant contributions to both the local bias and the regulation literatures. Our evidence indicates that rules governing firm disclosures have a first-order impact on the behavior of local market participants (investors and sell-side analysts), and consequently market prices. Further, the sharp decline in the informational advantage of local agents suggests that the new rules effectively changed the competitive landscape of the information acquisition process, consistent with their stated intent.

The rest of the paper is organized as follows. In the next section, we briefly review the related literature and institutional background that motivate our testable hypotheses. In Section 3, we describe our sample and data. We present our empirical findings in Sections 4 (local institutional investors), 5 (local analysts), and 6 (aggregate market effects). We conclude in Section 7.

2. Related Literature and Testable Hypotheses

2.1. Financial Regulation and the Information Environment

Many public companies regularly hold conference calls when their quarterly earnings reports are released to communicate issues that are not covered in those reports. Until the late 1990s, these conference calls were typically restricted to equity analysts and investors with substantial capital. Similarly, access to top-level executives was generally restricted to large market players because, it was argued, providing the same level of access to all investors would be too costly.

With the technological advancements of the 1990s, this cost argument lost relevance. In response, the U.S. Securities and Exchange Commission (SEC) proposed Regulation Fair Disclosure (Reg FD) in December 1999. The new rules would prohibit publicly-traded companies from selectively disclosing material non-public information to securities markets professionals ahead of general public disclosures. The general principle advocated by the new rules was that the disclosure of material information should be made to all investors at the same time. While small investors supported the new rules, large investors argued that forcing managers to provide equal access to all investors would lead to less access to value-relevant information for all investors (e.g., Weber (2000a, 2000b), Shiller (2000), SEC (2000), Hasset (2000), Bushee, Matsumoto, and Miller (2004), Duarte, Han, Harford, and Young (2008)). Despite these concerns, the SEC enacted Reg FD in October 2000.

The available empirical evidence on the consequences of Reg FD is somewhat mixed. Prior studies find no significant changes in stock price volatility (e.g., Bailey, Li, Mao, and Zhong (2003)), analysts' forecast accuracy (e.g., Heflin, Subramanyam, and Zhang (2003)), and effective trading spreads (Eleswarapu, Thompson, and Venkataraman (2004)), which suggests that Reg FD did not adversely affect the overall market quality. Consistent with these findings, Bushee, Matsumoto, and Miller (2004) conclude that Reg FD did not have a large adverse effect on

the disclosure policies of firms that previously allowed selective access to conference calls and that small investors benefited from the new rules. Duarte, Han, Harford, and Young (2008), however, document that Reg FD is associated with a slight increase in the typical firm's cost of capital. This finding suggests that the benefits to small investors may have come at the expense of reduced price efficiency.

Notwithstanding Reg FD's effects on overall market efficiency, there seems to be a consensus on the notion that the new rules affected firms' disclosure practices. Relatedly, while the new rules would affect all market participants, we expect their largest impact would be on those investors who enjoyed selective access to value-relevant information in the pre-Reg FD environment. In particular, if geographic proximity to management facilitated such access, then the new rules would reduce the competitive advantage of local capital market participants.

Not long after the passage of Reg FD, the public's confidence in the U.S. financial market was shaken by fraudulent accounting scandals at Enron, WorldCom, and several other companies. These highly-publicized scandals exposed significant weaknesses in public companies' financial reporting practices and resulted in several new proposals aimed at curbing fraudulent accounting (Holmström and Kaplan (2003), Coates (2007)). Most notably, the Sarbanes-Oxley Act (SOX) was enacted in July 2002 with widespread approval by individual and professional investors groups (Hochberg, Sapienza, and Vissing-Jorgensen (2009)). The proponents of the new rules advocated them as necessary to restore the smooth functioning of capital markets. In particular, SOX mandated new rules that would lead to enhanced financial disclosure, greater auditor independence, and improved corporate governance with the intent to improve the transparency, reliability, and accountability of firms' financial reports (Coates (2007)).[4]

Although they reach different conclusions regarding its effects on overall efficiency, several studies consistently provide evidence that SOX requirements affected firms' reporting behavior and were more beneficial to firms that operated in more opaque information environments prior to the new rules (e.g., Zhang (2007), Chhaochharia and Grinstein (2007), Li, Pincus, and Rego

[4]For example, Sections 101-109 created the Public Company Accounting Oversight Board (PCAOB) to provide for auditors' oversight; Sections 302, 401-406, 408-409, and 906 mandated new disclosure rules pertaining to internal control systems and officer certifications; Sections 201-209 and 303 further regulated public company auditors and auditor-client relationship; Sections 301, 304, 306, and 407 introduced requirements for listed companies pertaining to the composition of audit and control committees, and banned officer loans; Sections 802, 807, 902-905, 1102, 1104, and 1106 introduced criminal penalties for fraudulent misreporting; and Sections 806 and 1107 introduced new whistle-blower protections.

(2008), and Iliev (2010)). Similar conclusions are supported by recent evidence in Bauguess, Bernile, Lee, Marietta-Westberg, and Alexander (2013). They find that although compliance costs remain a concern among smaller firms, corporate insiders' views largely support the notion that SOX rules improve the quality of financial reporting and control processes and, thus, increase investor confidence in firm disclosures.

Even more than for Reg FD, the impact of SOX on overall efficiency is still debated (e.g., Cohen, Dey, and Lys (2008)). The available evidence, however, largely indicates that the enhanced financial disclosure resulting from the new rules increased the confidence of the investing public, especially of relatively small uninformed investors. We expect that these improvements would reduce the perceived costs of relying on firms' financial reports and relatively more so for uninformed investors. In turn, the perceived competitive advantage of investors located in firms' geographic proximity would be eroded as as result.

Overall, both Reg FD and SOX should lead to a more level playing field for relatively less informed capital market participants by making the information environment more competitive and transparent. These changes in the information environment would affect the behavior of local market participants, if the latter were better able to exploit local information sources prior to the new rules.

2.2. Financial Regulation and Local Market Participants

Anecdotal evidence suggests that proximity to firm management can yield informational advantage to local agents. In fact, in its release of Reg FD, the SEC explicitly mentioned that firms often disclose non-public information to both securities analysts and institutional investors.[5]

[5]Two subsequent SEC enforcement cases provide evidence of selective disclosure practices that may have benefited local institutional investors. In November 2001, the SEC contested that the CEO of Siebel Systems, a California-based technology company, disclosed nonpublic information to selected investors at an invitation-only technology conference hosted by Goldman Sachs & Company in California. In response to questions from a Goldman Sachs analyst, the CEO announced that he was optimistic about the firm since the business was returning to normal. This announcement was opposite to the negative statements made by the CEO three weeks earlier. Following the disclosure at the conference, attendees purchased Siebel's stocks or communicated the information to others who purchased Siebel's shares. Following the conference, Siebel experienced a one-day stock return of about 20% and trading volume twice as its daily average. Thus, investors who attended the conference enjoyed a substantial informational advantage. In another relevant enforcement case, the SEC contested in March 2002 that the CEO of Secure Computing (John McNulty) disclosed nonpublic information about a significant contract to two portfolio managers in violation of the Reg FD. The SEC took exception to the fact that Secure actively promoted its stock to institutional investors through in-person presentations, in addition to a series of conference calls and email exchanges with selected investors. *Source:* Secure Computing

Consistent with anecdotal evidence, previous research indicates that the local bias of institutional investors is at least partly due to a local information advantage (e.g., Coval and Moskowitz (1999, 2001), Baik, Kang, and Kim (2010)). Similarly, Malloy (2005) concludes that sell-side equity analysts have relatively better information about local firms. It is however an open question whether disclosure rules affect the informational advantage of local capital market participants such as institutional investors and equity analysts.

Local market participants may be able to extract greater benefits from local stocks with high information asymmetry as a result of selective access to corporate information and/or because proximity to firms reduces the costs of gathering and processing public information. Our main objective is to test whether exogenous shocks to firms' information environment influence the ownership patterns of local institutional investors, the coverage patterns of local equity analysts, and the informational advantage of these two groups of market participants. Our identification strategy exploits the regulatory changes introduced by Reg FD and SOX as a source of exogenous variation and focuses on the time-series properties of local institutional ownership and analyst coverage, as well as of the performance of these local agents around the new rules.

We organize our empirical tests around three broad sets of hypotheses concerning the effect of disclosure rules on (1) local ownership and coverage levels, (2) local information advantage, and (3) the link between local agents' behavior and aggregate market outcomes.

2.2.1 Impact on Local Institutional Ownership and Analyst Coverage

If market participants' preference for local stocks (at least partially) reflects a local informational advantage, then disclosure rules designed to level the information gathering and processing playing field should affect the behavior of local investors and equity analysts. In particular, we predict that:

> **H1-i:** Following disclosure rules that make the information environment more competitive and transparent, the excess ownership of local investors around corporate headquarters would decrease.

> **H1-ii:** Following disclosure rules that make the information environment more competitive and transparent, the excess coverage of local equity analysts around corpo-

Corporation and John McNulty, Exchange Act Release No. 46895, 2002 WL 310948 (November 25, 2002).

rate headquarters would decrease.

Moreover, if a local information advantage indeed drives local agents' behavior, then (i) this link should weaken following rules that make the information environment more transparent and competitive for all firms, and (ii) the effect of the regulation should be most pronounced among firms whose information environment is less transparent and competitive prior to the new rules. Therefore, we posit that:

> **H2-i:** Following disclosure rules that mandate increased competition and transparency of the information environment, capital market participants' preference for local stocks would depend less on features of firms' information environments.

> **H2-ii:** The effect of disclosure rules on local capital market participants' preferences would be largest for firms with less transparent and competitive information environments prior to the new rules.

2.2.2 Impact on Local Informational Advantage

Our next set of hypotheses, pertains more directly to the effect of disclosure rules on the informational advantage of local agents. In particular, we examine the performance of local investor portfolios conditional on the regulatory regime and posit that:

> **H3-i:** Following disclosure rules that make the information environment more competitive and transparent, the abnormal performance of institutional investors' local portfolios would decline.

Existing studies suggest that the forecasting behavior of sell-side equity analysts depends on their likely access to firm management (e.g., Bailey, Li, Mao, and Zhong (2003), Gintschel and Markov (2004), Agrawal, Chadha, and Chen (2006)). Therefore, similar to Malloy (2005), we use forecast accuracy as a proxy for sell-side equity analysts' performance. Similar to the logic of hypothesis H3-i, we posit that:

> **H3-ii:** Following disclosure rules that make the information environment more competitive and transparent, the forecast accuracy of local equity analysts would decline.

2.2.3 Impact on Market Outcomes

Our last set of hypotheses pertains to aggregate market participants' perceptions of the likely informational advantage of local agents. To conduct these tests, we examine the link between local ownership and market-based measures of information asymmetry conditional on the regulatory environment.

Specifically, first, we test whether the new rules affect the relation between excess local holdings and two common microstructure measures of the adverse selection component of stock prices – PIN and effective spread. We posit that:

> **H4:** Following disclosure rules that make the information environment more competitive and transparent, the link between institutional local bias and the adverse selection component of stock prices would weaken.

Second, we attempt to distinguish between the selective access and superior information processing channels. If the effects of the new rules mostly stem from the reduction in selective access, the weakening of the local ownership-adverse selection relation in the new regulatory regime should be mostly concentrated in periods *preceding* public disclosure events, such as earnings announcements. Conversely, if the effects mostly stem from the increased transparency of firm disclosures, the weakening of the local ownership-adverse selection relation should be mostly concentrated in periods *following* public disclosure events. To summarize, we posit that:

> **H5:** If the new rules mostly curb selective access to corporate information (increase the transparency of firms' disclosures), then the local ownership-adverse selection relation would become relatively weaker during pre-disclosure (post-disclosure) windows.

3. Data and Measures

3.1. Main Data Sources

Our core dataset includes all Compustat firms with available 10-K filings in the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system, with fiscal years ending between 1996 and 2008. There are 47,625 firm-year observations in our core dataset. Our second main dataset is

the quarterly common stock holdings of 13(f) institutions compiled by Thomson Reuters. We identify the institutional investor location (zip code) using the *Nelson's Directory of Investment Managers* and by searching the SEC documents and web sites of institutional managers. Our last main dataset is the research coverage of sell-side equity analysts from Thomson Reuters' I/B/E/S database. We augment this dataset with analyst location data.

In addition to the main data sources, we use several other standard datasets. We obtain price, volume, return, and industry membership data from the Center for Research on Security Prices (CRSP). The firm headquarters location data are from the historical header file of the CRSP-Compustat merged (CCM) database. We obtain the performance benchmarks for computing characteristic-adjusted stock returns from Russell Wermers' web site.[6] Data on auditors' identity and various other firm attributes are from Compustat.

We also use state-level Presidential elections data to identify the political orientation of U.S. states.[7] We obtain additional state-level demographic characteristics from the U.S. Census Bureau. Specifically, we consider state population density and the state education level (the proportion of state population above age 25 that has completed a bachelor's degree or higher) in our local ownership regressions. Further, using the religious adherence data from the "Churches and Church Membership" files available through the American Religion Data Archive (ARDA), we compute the proportion of Catholics (CATH) and the proportion of Protestants (PROT) in a state. Using the two religion variables, we define the Catholic-Protestant ratio (CPRATIO) to capture the relative proportions of Catholics and Protestants in a state. We also measure the overall religiosity of a region.

3.2. Excess Local Ownership, Holdings, and Coverage

The firm-level local institutional ownership is at the core of our hypotheses pertaining to the behavior of local investors. Following Korniotis and Kumar (2013), we measure quarterly local institutional ownership for each firm-state pair as the ratio of the number of firm shares held by institutions located within the state and the total institutional share ownership at the end of the quarter. We normalize the local institutional ownership by the weight of local (i.e., state) institutions in the aggregate institutional portfolio. This weight represents the expected level of

[6]The web site is `http://www.smith.umd.edu/faculty/rwermers/ftpsite/Dgtw/coverpage.htm`.
[7]The election data are obtained from David Leip's web site: `http://www.uselectionatlas.org`.

ownership by local institutions if they exhibit no abnormal preference for local firms. The state-level benchmarks account for the non-uniform geographic distribution of institutions across the U.S. and are higher for states with greater concentration of institutional investor capital. The difference between the quarterly firm-state institutional ownership and the percentage weight of the state's institutional investors in the aggregate institutional portfolio is our measure of *excess* local institutional ownership, LOCOWN:

$$\begin{aligned} \text{LOCOWN}_{ij} &= \frac{\text{State } j \text{ institutional ownership in firm } i}{\text{Total institutional ownership in firm } i} \\ &- \frac{\text{Dollar value of institutional portfolios in state } j}{\text{Dollar value of aggregate institutional portfolios}} \end{aligned} \tag{1}$$

In addition to the firm-level local ownership measure, we use an institution-level local bias measure in some of our empirical tests. Following previous local bias studies (e.g., Coval and Moskowitz (2001), Ivković and Weisbenner (2005)), we define the local bias of institution i located in state s as:

$$\begin{aligned} \text{HQ Local Bias}_i &= \text{Institution } i\text{'s portfolio weight of firms headquartered in state } s \\ &- \text{Market portfolio weight of firms headquartered in state } s. \end{aligned} \tag{2}$$

The first term in equation (2) is the value of institution i's holdings in firms headquartered in the institution's state divided by the total value of all institution i's holdings. The second term is the benchmark weight defined as the total value all firms headquartered in institution i's state divided by the value of the aggregate market portfolio. If institution i holds the market portfolio as prescribed by traditional portfolio theory, the HQ local bias measure would be zero.

To test our hypotheses regarding equity analysts' coverage decisions, we measure the quarterly local coverage of each analyst as the fraction of local stocks in that analyst's stock coverage portfolio and normalize this measure by the fraction of local stocks in the market portfolio:

$$\begin{aligned} \text{LOCCOV}_a &= \text{Fraction of stocks that are local in analyst } a\text{'s coverage portfolio} \\ &- \text{Fraction of local firms in the market portfolio.} \end{aligned} \tag{3}$$

3.3. Information Environment Proxies

To characterize a firm's information environment, we use multiple firm attributes. Our first set of proxies includes market-based measures of information asymmetry. Specifically, we use stock turnover as a measure of stock liquidity because better disclosure policies should reduce information asymmetry and, thus, result in higher liquidity (e.g., Glosten and Milgrom (1985), Leuz and Verrecchia (2000)). Our second market-based measure is idiosyncratic volatility because firms with low quality earnings have higher idiosyncratic return volatility (e.g., Diamond and Verrecchia (1991), Rajgopal and Venkatachalam (2011)).[8] Last, we consider idiosyncratic skewness of firms' stock returns because higher information ambiguity induces higher volatility and skewness in stock returns (Epstein and Schneider (2008)).

Our second set of proxies for a firm's information environment reflects the presence of information intermediaries. This choice is based on the notion that the presence of reputable auditors and other information intermediaries is associated with more transparent and competitive information environments (e.g., Healy and Palepu (2001)). Analyst following is directly related to availability of management forecasts (e.g., Soffer, Walther, and Thiagarajan (2000)) and disclosure quality (e.g., Lang and Lundholm (1993)). Auditors provide assurance that financial statements comply with accounting standards. They also alleviate concerns about the quality of information disclosed, as attested by the evidence that hiring a reputable auditor is beneficial even if not required by regulation (e.g., Leftwich (1983), Menon and Williams (1991)).

Our last information environment proxy is based on accounting data. Specifically, following common practice, we use the absolute modified-Jones discretionary accruals as a proxy for earnings quality. Higher values of this measure are likely to be associated with greater earnings management and worse information environments (e.g., Cohen, Dey, and Lys (2008)).

Table 1 provides summary statistics for the main variables used in our empirical analysis. We report key statistics for the full sample, as well as separately for the pre-regulation (1996 to 1999) and post-regulation (2000 to 2008) periods. The Appendix summarizes the definitions of all the variables. In most of our tests, the sample period is from 1996 to 2008.[9]

[8] Although low earnings quality can lead to higher idiosyncratic volatility, recent work by Hutton, Marcus, and Tehranian (2009) may indicate otherwise. Hutton et al. find that opaque (low quality) financial reports are associated with higher R^2 and, thus, lower scaled idiosyncratic volatility. While we use the unscaled measure of idiosyncratic volatility in our tests similar to Rajgopal and Venkatachalam (2011), we recognize that the recent evidence in Hutton et al. raises questions about its interpretation.

[9] The exception is due to the fact that the PIN decomposition data from Duarte and Young (2009) are only

4. Local Institutional Investors

In this section we discuss the evidence for the investment behavior and performance of local institutional investors. We begin by focusing on the results for the firm-level excess ownership of local institutions, and follow with the state institution-level local bias and local portfolio performance evidence.

4.1. Local Ownership

Figure 1 plots the time-series of the excess ownership of institutional investors located around firms' headquarters. In particular, the figure shows the annual mean excess local ownership (LOCOWN) computed at the end of each fiscal year as described in equation (1). Table 2 reports the actual numbers as well as more details regarding the time series.[10]

Although the overall level of institutional ownership exhibits an increasing trend (see Column (1) in Table 2), there is a notable decline in the level of local institutional ownership following the new rules. The average excess local ownership is consistently around 8% in each year of the pre-regulation period (see Column (2)), it drops sharply to below 6% immediately following the passage of Reg FD, and finally stabilizes at around 4% in the post-2003 period. The notable drop in excess local ownership mainly reflects changes in actual local ownership, as the benchmark level of local ownership does not vary much over time (see Column (3)).

In absolute terms, the drop in excess local ownership is larger for smaller firms. Specifically, the excess local ownership for small, medium, and large firms drop from 14.42%, 5.86%, and 2.98% in 2000 to 8.46%, 2.80%, and 1.91% in 2004, respectively. However, in relative terms, excess local ownership levels drops by about half across all size groups (see Columns (4) to (6)).

The evidence in Figure 1 and Table 2 suggests that there is a structural break in the local ownership time series around the year 2000. More formally, using Chow (1960) tests to identify potential breakpoints in the 1997 to 2007 period, we find that the most significant breaks occur in either 2000 or 2001. Our analysis also indicates that the break occurs earlier for larger firms than for smaller ones. This evidence is consistent with larger firms complying with Reg FD earlier than smaller firms due to their lower relative fixed cost of conducting open calls and their

available for the 1996 to 2004 period.

[10]Discrepancies in mean LOCOWN across Tables 1 and 2 arise because the sample in Table 1 is restricted to firm-year observations for which we could obtain information environment variables.

relative lack of concerns about attracting analysts coverage (Goshen and Parchomovsky (2001)).

Overall, consistent with Reg FD and SOX reducing information asymmetries between local and nonlocal investors, the evidence in Figure 1 and Table 2 shows that institutional ownership around firms' headquarters declines greatly in the new regulatory regime. While these time-series patterns support our conjecture (H1-i), our next tests exploit the variation in firms' information environments to identify more sharply the effects of the new rules.

4.1.1 Relation between Local Ownership and Information Environment

To conduct our next set of tests, we estimate a series of pooled cross-sectional regressions. The dependent variable is the firm-year level excess local ownership (LOCOWN). The main explanatory variables are attributes that characterize firms' information environment. In addition, we include firm HQ state time-varying attributes and fixed effects to account for state-level factors that affect local ownership patterns. The level of excess local institutional ownership is measured at the first quarter end following the firm fiscal year, while all explanatory variables are measured during or as of the end of the firm fiscal year. Following Petersen (2009), we compute the t-statistics using standard errors clustered by year and firm HQ state.

Our conjecture is that disclosure rules affect excess local institutional ownership directly (H1-i), as well as its relation with the firm's information environment (H2-i). In particular, we expect the local informational advantage to be lower in the new regulatory regime and, thus, excess local ownership to decline (H1-i). Moreover, we expect firms' information environment to become a weaker determinant of excess local ownership following the new rules (H2-i).

Table 3 reports regression estimates from the models with time-varying coefficients. Consistent with H1-i, we find that local ownership levels are significantly lower after the implementation of the new rules (see Column (1)). Excess annual local ownership drops on average by 2.46% in 2000 onwards compared to the pre-regulation period.

In the full-model specification (see Column (2)), we find that most coefficient estimates have the predicted signs and are statistically as well as economically significant. Specifically, firms with worse information environments (i.e., those with low turnover, high volatility, absence of major auditor, or no analyst following) have significantly higher excess local ownership prior to the new rules. Moreover, consistent with H2-i, the relations between excess local ownership and firm information environment proxies become significantly weaker in the new regulatory

regime.[11]

For example, during the pre-regulation period, the presence of a major auditor reduces excess local ownership by 7.15%. In contrast, after the new rules, the presence of a major auditor is associated with a statistically insignificant reduction of $7.15 - 5.03 = 2.12\%$ in excess local ownership. Similarly, a one standard deviation increase in idiosyncratic volatility is associated with $0.21 \times 6.699\% = 1.41\%$ higher excess local ownership in the pre-regulation period, which is economically meaningful relative to the mean local ownership level of 5.39%. In the post-regulation period, however, this relation becomes statistically and economically insignificant. Although the presence of a major auditor has the largest effect on local ownership, the coefficients on other information environment proxies such as turnover, idiosyncratic volatility, and analyst coverage reveal qualitatively similar patterns.

The overall weakening of the relation between firm-level information environment and excess local ownership supports our conjecture (H2-i), and suggests that disclosure rules are a first order determinant of institutional investors' preferences for local stocks.

4.1.2 Difference-in-Difference Tests

The earlier evidence supports the conjecture that the information environment drives institutional investors' preferences for local stocks. However, the causality may be in the other direction, if the geographic concentration of ownership structure affects the firm's information environment. For example, a firm with high local ownership concentration may not require a major auditor because it may more easily communicate with a large proportion of its investor base directly. Similarly, the demand for analyst services may be lower when a firm's local ownership is higher, which makes those services less valuable and reduces analysts' incentives to cover the firm.

To identify the causal effect of the information environment on excess local ownership, we perform difference-in-difference tests similar to other studies that examine the effects of financial regulation (e.g., Bushee, Matsumoto, and Miller (2004), Chhaochharia and Grinstein (2007)). With these tests, we aim to assess whether the changes in excess local ownership following the

[11] Two of the seven information environment proxies have insignificant coefficient estimates. This is due to the high correlation among several of those proxies. Indeed, when we estimate the model including only one information environment proxy at a time, the coefficient estimates are always statistically significant with the predicted sign.

new rules are larger for firms whose information environment is less transparent and competitive *prior to* the new rules.

Table 4 presents the estimates from the difference-in-difference regression models. The dependent variable in these models is the firm-level change in excess local ownership in each year of the new regulation regime relative to the pre-regulation regime. The explanatory variables of interest are the firm information environment proxies prior to the new rules. We measure all pre-regulation variables at the end of fiscal year 1999.[12] We also include post-regulation firm and state factors, as well as state fixed effects to control for anticipated variation in local ownership changes.

Consistent with our main conjecture and earlier results, the average firm-level change in excess local ownership is significantly negative in the new regulatory regime. Further, we find that the drop in local ownership is larger among stocks with poor information environment prior to the new rules: firms with low stock turnover, high discretionary accruals, without a major auditor, or no analyst following. For example, the coefficient on major auditor in Column (2) suggests that the excess local ownership of firms without a major auditor prior to the new rules drops on average by an incremental 2.80% compared to firms with a major auditor.

The results are qualitatively similar for other information environment proxies even though not all estimates are statistically significant. Overall, the results from the difference-in-difference tests support Hypothesis H2-ii and suggest that a firm's information environment has a causal impact on its excess local ownership.

4.1.3 Robustness Checks

In this section, we discuss the robustness of our baseline results regarding institutional investors. First, we investigate whether our findings reflect an increased awareness against holding own employer stocks rather than regulation-induced declines in local ownership. In particular, we redefine the excess local ownership measure after excluding institutional investors that are classified as public or corporate pension funds, university endowments, or miscellaneous. We repeat our main tests using this restricted measure and report the results in columns labeled "No PF" in Tables 3 and 4. Our main conclusions are unaffected and in fact some of the earlier results

[12] We obtain qualitatively similar results when we repeat the analysis using the 1996-1999 time-series averages for the relevant pre-regulation information environment and local ownership variables.

become more significant statistically.

Next, we control for the effect of low priced stocks on our baseline results. Low priced stocks are typically characterized by more volatile and skewed returns, and are more likely to be subject to potential microstructure biases (e.g., large bid-ask spread), which may have a disproportionate impact on our empirical findings. To assess whether our main results depend on the unique attributes of low-priced stocks, in Column (4) of Tables 3 and 4, we repeat our tests after excluding stocks priced below $2. The evidence shows that our results are robust to imposing this restriction and indicates that the patterns of disappearing local ownership are not restricted to the subsample of low priced stocks.[13]

Another potential concern stems from the uneven geographical distribution of firms' headquarters across the U.S. The top two states, California and New York, account for approximately 11% of the firm-years in our sample. The economic forces at play at these locations may be unique. In particular, there is a high concentration of technology firms in California, for which information asymmetries may be more severe. In addition, the pre-regulation period corresponds to the Internet frenzy period, which could also influence our results. Further, given the high concentration of financial institutions and large brokerage houses in New York, Reg FD may have a disproportionate impact on New York-based firms.

Column (5) of Tables 3 and 4 reports the regression estimates for subsamples of firms whose headquarters are not in California or New York. These subsample results are qualitatively similar to the full-sample results, which indicates that the phenomenon of disappearing local information is not restricted to the two most business populated states.

To further control for the burst of the tech bubble that coincided with the adoption of Reg FD, we also repeat our main tests after excluding technology firms. The column labeled "No Tech" in Tables 3 and 4 reports the results of these tests. Our conclusions are not affected by the exclusion of technology firms, as the magnitudes and statistical significances of the regression estimates are similar to our baseline results.

[13] We also restricted the sample using a $5 price filter and obtain qualitatively similar results, although the power of our tests diminishes because the sample size decreases by approximately 15%.

4.2. Regulation and Informational Advantage of Local Investors

In this section, we examine the performance of local institutional investors conditional on the regulatory regime. Our main objective is to assess whether the institutional investors' local informational advantage declines following the new rules designed to curb selective dissemination of corporate information and improve the reliability of firms' financial reports.

Because we shift our focus on investor portfolios as our unit of observation, before estimating the local performance, we perform a test similar in spirit to the local ownership analysis reported in Table 2. Specifically, we calculate the *Excess Local Weight* of each institutional investor's quarterly portfolio snapshot as the percentage of the investor's portfolio invested in stocks located in the investor's state (local stocks) minus the percentage of the "market portfolio" located in the investor's state. Then, we compute the average excess local weights across all institutional investors' portfolios in each quarter and report in Table 5 the time-series average of the mean quarterly portfolio over various subperiods. When averaging across institutions' quarterly portfolios, we weigh them equally or by their total value at the beginning of the quarter. This analysis is similar to the analysis in Coval and Moskowitz (2001), except that we use the full sample of 13-F institutions (rather than the mutual fund sample) and extend their analysis (that ends in 1995) to 2008.

Independent of the averaging method, the results are similar to the evidence based on firms as our unit of observation. Institutional investors' local bias is large and significant in the pre-regulation period, and declines significantly after the new rules. Using equal-weighted averages, for example, the excess local weights of institutional portfolios decline by more than 55 percent in the 2004–2008 period relative to the pre-regulation period (1996–1999).

4.2.1 Local Institutional Portfolio Performance

Coval and Moskowitz (2001) find that mutual fund managers tend to earn higher returns on the local stocks in their portfolios, consistent with a local informational advantage. We follow Coval and Moskowitz (2001) in our analysis of the performance of institutional investors' local and non-local holdings. In this analysis, the unit of observation is the quarterly performance of the location-based subportfolios of each institutional investor in our sample. Specifically, for each institution with non-zero portfolio weight in local stocks, we calculate the quarterly

characteristics-adjusted returns of its local and non-local stock portfolios, as well as the corresponding performance differential (local minus non-local). *Local Portfolio* comprises stocks in the investor's portfolio that are headquartered in the investor's state, while *Non-Local Portfolio* comprises all other holdings of the same investor. We normalize stock returns using Daniel, Grinblatt, Titman, and Wermers (1997) approach to control for variations in size, book-to-market, and past 12-month return.

As shown in Panel A of Table 6, local holdings of institutional investors outperform non-local holdings prior to the new rules (1996-1999). Using dollar-weighted averaging, local holdings outperform non-local holdings by about 13 basis points per month, or about 1.5 percent annually. Consistent with our conjecture (H3-i), however, the superior performance of local holdings disappears following the new rules. The performance differential is not significantly different from zero and the point estimates are generally negative in the post-regulation subperiods. In untabulated tests, we find similar evidence when using stock-level returns as the unit of observation. Thus, our performance results do not depend on the unit of aggregation (i.e., firm or institution).

In Panel B, we examine the performance of institutional "trades". Given that we do not observe actual trades of 13-F institutions, we use the quarterly net changes in holdings to measure the (net) trading by each institution during a quarter. We then measure the average performance of net changes in local/non-local holdings.[14] The evidence in Panel B is similar to the holdings-based performance results in Panel A. Consistent with reduced local information advantage following the new rules (H3-i), local trades earn abnormally high average returns (i.e., about 1.8% higher annual return than non-local trades) prior to 2000, but this superior local performance declines and in fact disappears in the new regulatory regime.

5. Regulation and Local Equity Analysts

In this section, we discuss the evidence pertaining to Hypotheses H1-ii and H3-ii for the behavior and performance of local equity analysts around the implementation of Reg FD and SOX.

[14]This is the "Portfolio Change Measure" introduced by Grinblatt and Titman (1993) and referred to as the GT measure in Daniel, Grinblatt, Titman, and Wermers (1997). More precisely, the trading performance is calculated as the difference between the performance of the investor portfolio as reported at the end of the previous quarter and that of the investor portfolio as reported at the beginning of the previous quarter. Because the returns from the part of the portfolio that does not change over the quarter cancel out, the resulting trading performance measure solely depends on the part of the portfolio that changes during the previous quarter.

To the extent that the new rules increase the competition and transparency of firms' information environment, we expect that analysts' local informational advantage and, thus, their local coverage bias would decline in the new regulatory regime.

5.1. Regulation and the Behavior of Local Equity Analysts

We begin by examining analysts' propensity to cover local stocks conditional on the regulatory regime. For this purpose, as described in equation (3), we define analyst's excess local coverage as the difference between the fraction of local stocks in the analyst coverage portfolio minus the fraction of local stocks in the market portfolio. Unlike institutional investors, there is no obvious weighting scheme for analyst coverage. Therefore, we examine both the equal- and value-weighted fraction of stocks covered by an analyst.

In untabulated analysis, we find that sell-side analysts around corporate headquarters display an abnormal propensity to cover local stocks, but their excess local coverage propensity declines significantly following the new rules. In the pre-2000 period, the value-weighted analyst excess local coverage is approximately 8%, while the equal-weighted excess coverage is approximately 11%. In the new regulatory regime, consistent with H1-ii, the excess local coverage measure declines by about 40% to approximately 4.5% (value-weighted) or 7% (equal-weighted).

To assess the statistical significance of these patterns, Table 7 reports the parameter estimates from pooled cross-sectional regression models of analyst excess local coverage on a post-regulation indicator variable (equal to 1 in years 2000 onwards), POSTREG, controlling for analyst characteristics and state fixed effects. In particular, the models include analyst tenure, past performance, number of firms covered, and an indicator variable for analysts employed by prestigious brokerage houses. The average excess local coverage throughout our sample period is 9.61 (6.28) percent using equal- (value-) weighting.

The estimates in models (1) and (3) support our conjecture (H1-ii). In particular, the evidence indicates that, relative to the pre-regulatory period, excess local coverage declines by 3.07 to 3.48 percentage points following the new rules. Conditioning on the prestige of brokerage houses, we find that analysts from prestigious brokerage houses have significantly lower local bias prior to 2000, perhaps because brokerage house prestige would grant the analyst better access to any firm. Following the new rules, however, the prestige-driven differences in local bias across analysts disappear due to the large decrease in the local bias of analysts from less

prestigious employers. This evidence suggests analysts may enjoy more similar access across firms in the new regulatory regime.

5.2. Regulation and the Performance of Local Equity Analysts

We next examine the performance of local analysts. For this purpose, we focus on the accuracy of the analysts' quarterly earnings forecasts. Since analysts are evaluated against their peers, we employ two *relative* accuracy measures that compare an analyst's forecast against all other analysts' forecasts for the same earnings report. The first measure is an indicator variable for whether the analyst's forecast error is below the median peer error. The second measure is the percentile ranking of the analyst's forecast error. In addition, following Malloy (2005), we also use the demeaned absolute forecast error (DAFE) to measure analyst forecast accuracy, where a negative (positive) DAFE implies better (worse) than average analyst forecast accuracy.

Table 8 reports the coefficient estimates from regression models that relate the analyst accuracy measures to a LOCAL indicator variable, which equals one when the analyst and the firm headquarters are in the same state, the interaction of LOCAL with POSTREG, and quarter-analyst fixed effects that absorb all analyst-quarter skill and characteristics factors. We do not include the stand-alone regime variable, POSTREG, or any time fixed effects because they are subsumed by the analyst-quarter fixed effects. We cluster standard errors by earnings report (i.e., covered firm-quarter).

The evidence in Table 8 indicates that local analysts are more accurate than their peers prior to the new rules, consistent with the local informational advantage documented in Malloy (2005). However, the superior accuracy of local analysts declines significantly following Reg FD, consistent with our conjecture H3-ii. Adding up the point estimates of LOCAL and LOCAL $\times$ POSTREG in Columns (1), (2), or (3), the superior performance of local analysts is at best negligible in the new regulatory regime.

When we estimate the forecast accuracy models for different subperiods, we find that LOCAL has a significantly negative coefficient estimate prior to the new rules (see Column (4)), consistent with Malloy (2005). However, the coefficient is statistically and economically insignificant during the post-2000 period (see Column (5)), consistent with our conjecture (H3-ii). This evidence supports the notion that local analysts have no local informational advantage in the new regulatory regime.

Collectively, the results in Tables 7 and 8 are consistent with our predictions regarding local analysts' behavior and performance around the passage of Reg FD and SOX (H1-i and H3-ii). In line with the institutional investor results in the previous section, this evidence lends further support to our main conjecture that the new disclosure rules at the turn of the millennium reduced the informational advantage of local capital market participants.

5.3. Local Analysts and Local Investors

In this short subsection, we discuss some untabulated results about the relation between the informational advantage of local analysts and local investors. Specifically, we examine whether recommendations by local analysts drive the behavior and performance of local institutions. For this purpose, we estimate the institutional local bias and performance conditional on local analysts' presence. Specifically, we sort states into three groups based on the number of analysts in the state: top 5 states, 6th to 20th, and others. This grouping is done to ensure that institutional investors are spread as evenly as possible across the three groups. Then, within each group, we measure the institutional investors' local bias as well as their subportfolios performance across the different regulatory regimes.

We find that the pattern of declining local investor bias is similar, irrespective of the local analyst presence. However, the time-series patterns in local performance are quite different. In states with a high number of local analysts, institutional investors do not experience superior local performance both before and after the new rules. In contrast, institutions exhibit superior local performance in states with low analyst presence prior to the new rules and this superior performance declines significantly in the new regime.

The evidence from these supplemental tests suggests that the local informational advantage of institutional investors does not merely reflect the informational advantage of local equity analysts. In fact, it seems that the two sets of local agents likely compete for the acquisition and exploitation of local information prior to the new rules enacted at the turn of the millennium.

6. Regulation and Ownership-Adverse Selection Relation

In this section, we examine the relation between local ownership and stock market-based measures of adverse selection. Our main objective is to determine whether market outcomes associate

excess local ownership with future informed trading and, importantly for our purposes, whether this relation changes around the implementation of Reg FD and SOX rules. A natural corollary of our conjecture that local informational advantage declines with the new rules is that the local ownership-adverse selection relation would be positive prior to the new rules and become significantly weaker in the new regulatory regime.

6.1. Regulation and Market-Based Adverse Selection Measures

To conduct our tests, we rely on two sets of microstructure variables intended to proxy for adverse selection in equity trading. The first set is based on the probability of informed trading (PIN) introduced by Easley, Hvidkjaer, and O'Hara (2002), which Duarte and Young (2009) decompose into the probability of private information-driven trades (i.e., ADJPIN) and the probability of symmetric order flow-driven trades (i.e., PSOS).

The second set is based on trading spreads. We use the effective spread, defined as the difference between the executed price and the midpoint of the bid-ask spread. Effective spreads reflect the price impact of trading, which theory indicates should depend on the market-maker's (or liquidity provider's) expectation of trading against informed agents.

Consistent with Hypothesis H4, we find that the adverse selection components of stock prices are on average directly and significantly related to prior year-end excess local ownership levels across the sample period (see Table 9, Panel A). When we condition on the regulatory regime, however, we find significant differences in the strength of those relations. The results in Panel B of Table 9 indicate that the relation between ADJPIN and local bias weakens in the new regulatory regime and becomes statistically insignificant. In contrast, the relation between PSOS and local ownership is positive and significant prior to the new rules, and continues to be so in the new regime. Therefore, while the positive relation between PIN and the degree of local ownership reflects both adverse selection and liquidity considerations prior to Reg FD, it is predominantly driven by liquidity consideration in the post-regulation environment.

The trading spread-based evidence supports similar inferences. The results from these tests are reported in Columns (4) to (6) of Panels A and B in Table 9. In the pre-2000 period, there is a significant positive relation between local ownership and subsequent spreads, and this relation becomes significantly weaker after the reforms. When we separate the 3-day window (i.e., -1:$+1$) around earnings announcements (SPDEARN) from non-earnings-announcement

periods (SPDOTH), the results are qualitatively similar. However, the evidence indicates that the attenuating effects of regulatory changes on the local ownership-adverse selection relation is more significant during periods of less intense public disclosures.

Overall, the results from our microstructure-based tests support the notion that market participants expect local investors to engage in (privately) informed trading prior to the new rules and that this expectation is greatly reduced in the new regulatory regime.

6.2. Zooming in on Earnings Announcement Windows

In this subsection, we focus more sharply on the periods around earnings announcements to attempt to disentangle the selective access versus superior information processing channels as the primary source of local investors' informational advantage in the pre-2000 period. The evidence in Table 9 indicates that the attenuating effects of the new rules on the local ownership-adverse selection relation is more acute outside of short windows around earnings announcements. This attenuating effect may be due to the reduced selective disclosure provided to local investors. Or, it may be due to reduced opportunities for investors to exploit local sources in processing public information due to the increased quality of firms' disclosures. The selective access explanation implies that the attenuating effect of the new rules should be stronger for periods leading to public disclosures - i.e., *prior to earnings announcements*, while the higher quality disclosure explanation implies that the effect should be stronger for periods after public disclosures - i.e., *following earnings announcements*.

Similar to our previous tests, we use effective spreads as our main construct to proxy for the expected presence of informed trading. Panel C of Table 9 reports the results from the additional spread-based tests. Specifically, we report the relation between local ownership and spreads in the periods before and after earnings announcements, conditional on the regulatory regime. Although local ownership is associated with higher spreads both before and after earnings announcement, we find evidence of an attenuating effect of the new rules on the local ownership-adverse selection relation *only* in the pre-earnings announcement window. This finding suggests that the new rules affected local investors' informational advantage mainly through reduced access to corporate information *prior* to its public disclosure, as mandated by Reg FD.

Overall, these supplemental results indicate that the local informational advantage of institutional investors prior to the new rules likely reflects selective access to firm management.

Furthermore, the evidence supports the notion that this source of local informational advantage is effectively curbed after the implementation of the new rules.

7. Summary and Conclusion

We examine whether the introduction of disclosure rules that improve the transparency and competitiveness of the information environment affects the behavior and performance of capital market participants – institutional investors and equity analysts – located near the firms.

We find that the local bias of these market participants is greatly reduced following the adoption of Regulation Fair Disclosure and the Sarbanes-Oxley Act. Suggesting a causal impact, the decline in local bias is more salient among firms that operate in less transparent and competitive information environments prior to the new rules. Further indicating a decline in local informational advantage, the abnormal performance of institutional investors and analysts around corporate headquarters declines sharply following the new rules. Even at the aggregate market level, the degree of informed trading attributed to local investors declines significantly. Supplemental tests indicate that the new rules affected institutional investors' behavior primarily by curtailing selective access to corporate information.

Overall, we demonstrate that firms' information environment is a first-order determinant of capital market participants' local information advantage. Therefore, disclosure rules that improve the transparency and competitiveness of the information playing field can have a large impact on agents' incentives to focus on local firms.

In future research, it would be interesting to investigate whether and to what extent the staggered implementations of SOX-like regulations in major capital markets around the world affect home bias – the international counterpart of the local bias phenomenon. If, like in the United States, the information environment affects domestic and foreign investors' participation in equity markets, we would expect a decline in home bias and a concurrent inflow of foreign investors' capital in countries that adopt more stringent disclosure rules.

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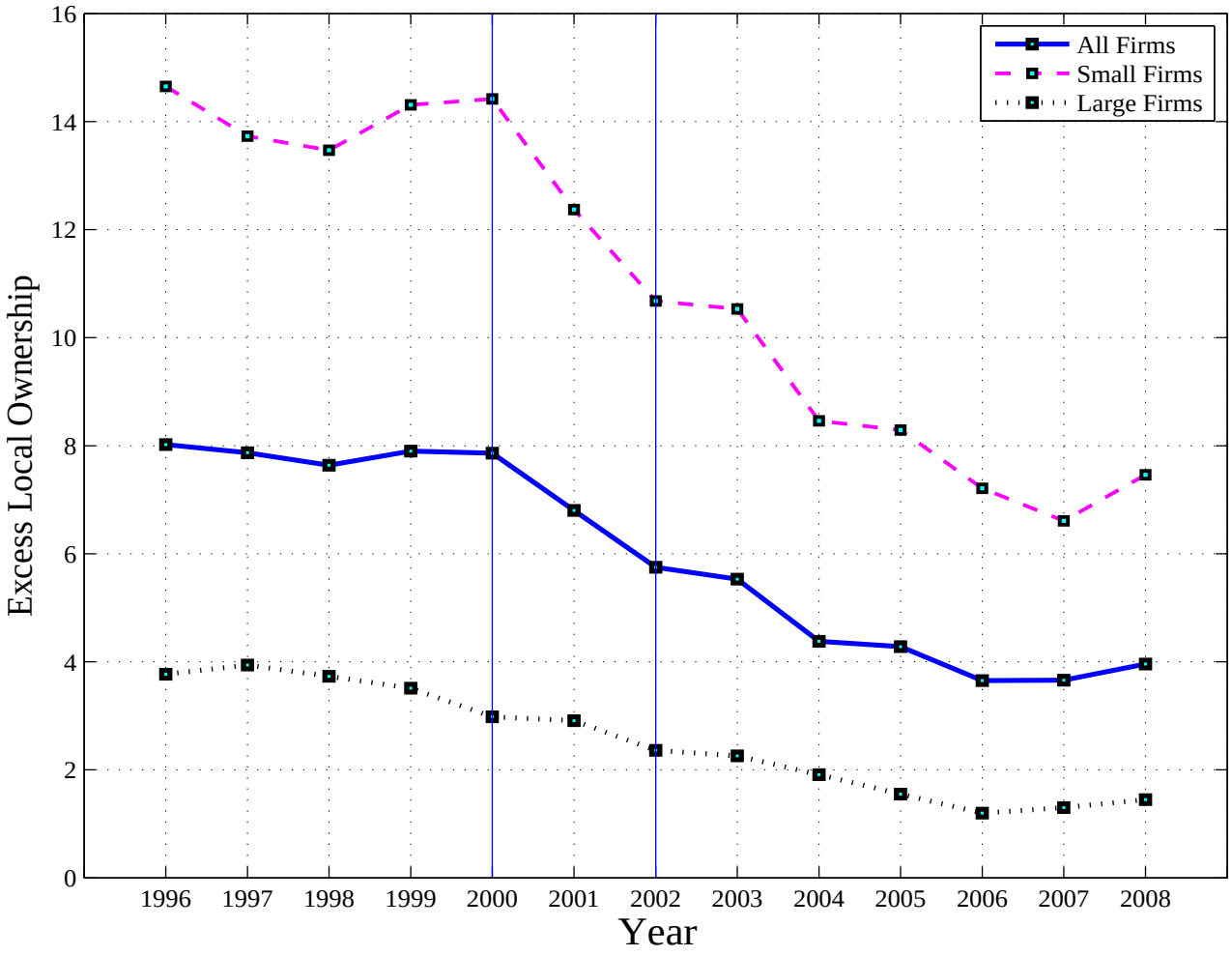

Figure 1. Excess local ownership around firm headquarters. This figure shows the mean excess equal-weighted local ownership time series for the full sample of firms. Excess local ownership is the state institutional ownership of a firm's HQ state minus that state's average state institutional ownership. Small and large firms subsamples contain firms in the lowest and highest firm size quartiles, respectively. Additional details about the variables are available in the Appendix.

Table 1
Summary Statistics

This table reports the summary statistics for main variables used in the empirical analysis. The variables are defined in the Appendix. The full sample period is from 1996 to 2008. PREREG period includes firm-fiscal years ending starting in 1996 and ending prior to or in calendar year 1999. POSTREG period includes firm-fiscal years ending in calendar year 2000 onward. The definitions of all variables are provided in the Appendix. *, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

		Full Sample: 1996-2008				PREREG: 1996-1999		POSTREG: 2000-2008	
Variable	Short Name	N	Mean	Median	Std Dev	Mean	Median	Mean	Median
Firm-Level Local Ownership Measure									
Local Ownership HQ	LOCOWN	47,625	5.390	0.300	16.870	6.760	0.660	5.250	0.190
Next Quarter Return:									
Raw Return	RAWRET	44,546	3.290	0.700	32.570	5.110	0.850	1.500	−0.270
CRSP-EW Adj.	EWRET	44,546	−0.380	−2.760	31.050	−0.550	−4.430	−0.490	−2.210
CRSP-VW Adj.	VWRET	44,546	2.340	−0.450	31.560	2.670	−1.980	3.240	1.280
DGTW Char. Adj.	CADJRET	38,062	1.200	−1.050	29.320	1.710	−1.550	1.860	0.020
Information Environment Variables									
Turnover	TURN	47,625	1.406	0.933	1.432	1.247	0.790	1.495	0.959
Idio. Volatility	IVOL	47,625	9.562	7.762	6.699	10.103	8.500	12.981	11.242
Idio. Skewness	ISKEW	47,625	0.139	0.133	0.706	0.164	0.169	0.159	0.141
Major Auditor	MAJAUD	47,625	0.847	1.000	0.360	0.925	1.000	0.917	1.000
Analyst Coverage	ANCOV	47,625	6.006	4.000	6.394	5.627	4.000	5.670	4.000
Num. of Analysts	NUMANA	47,625	0.821	1.000	0.383	0.812	1.000	0.814	1.000
Abs. Disc. Accruals	ABSDACC	38,678	0.273	0.071	0.644	0.125	0.055	0.418	0.135

Continued ...

		Full Sample: 1996-2008				PREREG: 1996-1999		POSTREG: 2000-2008	
Variable	Short Name	N	Mean	Median	Std Dev	Mean	Median	Mean	Median
Other Firm Characteristics									
log(Market Cap)	MCAP	47,625	12.823	12.760	1.941	12.544	12.450	12.491	12.471
Book-To-Market	BM	47,553	0.583	0.472	0.584	0.582	0.458	0.672	0.536
Financial Leverage	FINLEV	47,500	0.180	0.115	0.201	0.193	0.136	0.184	0.111
Firm Age	AGE	47,625	14.848	9.000	15.507	13.615	8.000	14.119	8.000
6m Lagged Return	RET6M	46,296	0.083	0.034	0.419	0.117	0.054	0.044	0.008
Stock Price	PRICE	47,625	21.884	17.365	18.180	21.189	16.726	20.967	15.620
Lottery-Type Stock	LOTT	47,604	0.335	0.000	0.472	0.325	0.000	0.333	0.000
Local Attributes									
Education	EDU	47,625	25.490	26.100	3.701	24.752	25.320	26.092	26.600
Pop. Density	POPDEN	47,625	313.783	217.998	455.044	305.148	211.515	319.088	217.998
Cath.-Prot. Ratio	CPRATIO	47,625	0.499	0.521	0.108	0.505	0.523	0.495	0.520
Religiosity	REL	47,625	1.426	0.956	1.236	1.405	0.956	1.493	1.020
Republican	REPUB	47,625	0.731	1.000	0.443	0.815	1.000	0.706	1.000
Microstructure Variables									
PIN	PIN	12,483	0.177	0.151	0.096	0.185	0.159	0.173	0.145
Adv. Selection	ADJPIN	12483	0.145	0.127	0.070	0.151	0.135	0.141	0.121
Liquidity	PSOS	12,483	0.257	0.216	0.136	0.263	0.219	0.259	0.223
Effective Spread	SPREAD	35,057	0.404	0.186	0.541	0.617	0.399	0.384	0.188
Around Earnings	SPDEARN	35,057	0.422	0.199	0.581	0.626	0.408	0.414	0.206
Excl. Earnings	SPDOTH	35,057	0.403	0.185	0.541	0.616	0.398	0.383	0.187
Analyst-Related Measures									
High Performance	HIGHPERF	23,566	0.345	0.333	0.208	0.346	0.333	0.331	0.316
Tenure	TENURE	23,566	23.626	17.000	20.218	23.359	18.000	23.332	17.000
Prestigious Broker	PBROKER	23,566	0.334	0.000	0.472	0.342	0.000	0.376	0.000
Num. of Firms Covered	NFCOVER	23,566	10.995	10.000	6.175	11.117	10.000	10.329	10.000
Demeaned Abs. Fore. Err.	DAFE	786,605	−0.093	−0.008	0.344	−0.132	−0.005	−0.172	−0.008

Table 2
Annual Local Ownership and Ownership Concentration Estimates

This table reports annual averages for local ownership, ownership concentration, and local analyst coverage measures. All measures are multiplied by 100 to improve readability. For comparison, in Column (1), we report the mean equal-weighted institutional ownership (IO) across all CRSP firms. Column (2) reports the full-sample annual excess local ownership estimates for firm headquarters (HQ) states. To provide a benchmark, the mean expected level of local ownership is reported in Column (3). Columns (4) to (6) report the excess local ownership estimates for small, mid-sized, and large firms, respectively. The definitions of all variables are provided in the Appendix.

				Excess Local Ownership (4-6)		
	Institutional	Excess	Expected	Small	Mid	Large
	Ownership	Local Ownership	Local Ownership	Cap	Cap	Cap
Year	(1)	(2)	(3)	(4)	(5)	(6)
1996	26.89	8.02	7.37	14.65	5.76	3.77
1997	27.96	7.87	7.35	13.73	5.88	3.94
1998	28.41	7.64	7.19	13.47	5.76	3.73
1999	28.27	7.90	7.58	14.31	5.50	3.51
2000	29.07	7.86	8.00	14.42	5.86	2.98
2001	30.56	6.80	7.84	12.37	5.05	2.91
2002	33.19	5.75	7.77	10.68	4.18	2.36
2003	36.09	5.53	7.46	10.53	3.74	2.26
2004	40.71	4.38	7.52	8.46	2.80	1.91
2005	42.70	4.28	7.59	8.29	3.06	1.55
2006	44.53	3.65	7.63	7.21	2.59	1.20
2007	48.46	3.66	7.84	6.61	3.11	1.30
2008	48.03	3.96	7.77	7.46	2.98	1.45

Table 3

Information Environment and Excess Local Ownership: Estimates From Time-Varying Coefficients Specifications

This table reports pooled cross-sectional regression coefficient estimates and corresponding t-statistics for the relation between firm-level excess local ownership (LOCOWN) and the characteristics of the firm information environment conditional on the regulatory regime. We also control for time-varying firm and state characteristics and consider regime as well as state fixed effects. The level of firm local excess institutional ownership is measured as of the fiscal year end, and all explanatory variables are measured during the same fiscal year. POSTREG is an indicator variable equal to one for fiscal years ending in calendar years 2000 and onward. The excess local ownership dependent variable in Column (3) is recalculated after excluding institutional investors that are classified as public or corporate pension funds, university endowments, or miscellaneous. The results in Columns (4) through (6) are based on samples that exclude stocks priced below \$2, firms located in California or New York states, and high-tech firms, respectively. The definitions of all variables are provided in the Appendix. Following Petersen (2009), the t-statistics reported in parentheses are based on standard errors clustered by year and state. The sample period is from 1996 to 2008.

Dependent Variable: Excess Local Ownership (in %)

	Firm Headquarters (HQ)		Robustness (3-6)			
			No PF	Prc.>$2	No CA/NY	No Tech
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)
POSTREG	−2.46	−5.23	−5.05	−4.63	−5.35	−4.36
	(−4.6)	(−2.8)	(−2.4)	(−2.4)	(−2.6)	(−2.3)
TURN		−0.69	−0.75	−0.58	−1.13	−0.73
		(−2.8)	(−2.6)	(−2.7)	(−3.6)	(−2.8)
TURN × POSTREG		0.42	0.41	0.36	0.77	0.50
		(1.6)	(1.3)	(1.5)	(2.3)	(1.7)
IVOL		0.21	0.21	0.18	0.21	0.20
		(3.4)	(3.3)	(3.1)	(2.8)	(3.1)
IVOL × POSTREG		−0.24	−0.23	−0.22	−0.25	−0.21
		(−3.6)	(−3)	(−3.4)	(−2.9)	(−3.1)
ISKEW		0.07	0.10	0.10	0.06	−0.11
		(0.3)	(0.4)	(0.4)	(0.3)	(−0.4)
ISKEW × POSTREG		0.05	0.04	0.02	0.14	0.34
		(0.2)	(0.1)	(0.1)	(0.5)	(1.1)
MAJAUD		−7.15	−7.32	−6.28	−8.83	−6.38
		(−5.6)	(−5.7)	(−4.8)	(−4.8)	(−6.2)
MAJAUD × POSTREG		5.03	5.16	4.33	5.24	3.87
		(3.8)	(3.7)	(3.1)	(2.7)	(3.4)
ANCOV		−4.28	−4.08	−3.56	−4.76	−4.70
		(−5.8)	(−5.5)	(−4.7)	(−6.5)	(−5.2)
ANCOV × POSTREG		1.2	0.84	0.75	2.89	1.39
		(1.1)	(0.8)	(0.7)	(3.3)	(1.2)
ABSDACC_RANK		0.27	0.11	0.27	0.09	0.11
		(1.3)	(0.6)	(1.3)	(0.5)	(0.5)
ABSDACC_RANK × POSTREG		−0.17	0.04	−0.16	−0.03	−0.05
		(−0.7)	(0.2)	(−0.6)	(−0.1)	(−0.2)
LOCANCOV		0.64	0.81	0.57	1.19	0.80
		(1.6)	(2.2)	(1.5)	(3.5)	(2.2)
LOCANCOV × POSTREG		−0.96	−1.22	−0.65	−0.92	−0.96
		(−2.1)	(−2.8)	(−1.5)	(−2.2)	(−2.2)
Firm Controls	No	Yes	Yes	Yes	Yes	Yes
State Controls	No	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
N	40,640	36,558	36,558	34,846	24,940	25,695
R^2	0.062	0.128	0.115	0.126	0.147	0.125

Table 4
Change in Local Ownership and Pre-Regulation Information Environment

This table reports pooled cross-sectional regression coefficient estimates and corresponding t-statistics predicting the firm-level changes in excess local ownership relative to end of fiscal year 1999 level of that measure. The main independent variables are the characteristics of the firm information environment at the end of fiscal year 1999. We also control for time-varying firm and state characteristics as well as state fixed effects. The level of firm local excess institutional ownership is measured as of the fiscal year end, and all explanatory variables are measured during the same fiscal year. The intercept in Column (1) captures the general trend of the dependent variable for fiscal years ending in calendar years 2000 and onward). The excess local ownership dependent variable in Column (3) is recalculated after excluding institutional investors that are classified as public or corporate pension funds, university endowments, or miscellaneous. The results in Columns (4) through (6) are based on samples that exclude stocks priced below \$2, firms located in California or New York states, and high-tech firms, respectively. The definitions of all variables are provided in the Appendix. Following Petersen (2009), the t-statistics reported in parentheses are based on standard errors clustered by year and state. The sample period is from 1996 to 2008.

Dependent Variable: Change in Excess Local Ownership (in %), Relative to 1999

	Firm Headquarters (HQ)		Robustness			
			No PF	Prc.>\$2	No CA/NY	No Tech
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	−2.02					
	(−7.9)					
$TURN_{1999}$		0.41	0.53	0.36	0.32	0.76
		(3.8)	(5.8)	(3.6)	(3.0)	(4.1)
$IVOL_{1999}$		0.08	−0.08	0.07	0.02	0.02
		(3.5)	(−3.4)	(2.7)	(0.7)	(0.7)
$ISKEW_{1999}$		−0.36	−0.70	−0.43	−0.44	−0.77
		(−2.2)	(−3.8)	(−2.3)	(−2.2)	(−3.2)
$MAJAUD_{1999}$		2.80	3.24	3.12	2.71	5.29
		(4.5)	(3.5)	(4.4)	(3)	(5.9)
$ANCOV_{1999}$		0.56	0.26	0.18	1.03	0.62
		(1.4)	(0.6)	(0.5)	(2.4)	(1.3)
$ABSDACC\_RANK_{1999}$		−1.25	−0.58	−1.07	−0.25	−0.91
		(−5.6)	(−3.5)	(−5.0)	(−2.0)	(−3.3)
$LOCANCOV_{1999}$		0.01	0.55	0.00	−0.55	−0.63
		(0.0)	(1.4)	(0.0)	(−2.5)	(−2.1)
Firm Controls	No	Yes	Yes	Yes	Yes	Yes
State Controls	No	Yes	Yes	Yes	Yes	Yes
State FE	No	Yes	Yes	Yes	Yes	Yes
N	17,136	16,597	16,597	15,808	11,206	11,837
R^2	0.000	0.053	0.051	0.058	0.063	0.079

Table 5
Local Bias at Institutional Level: Subperiod Estimates

This table reports the abnormal fraction of institutional investors' equity holdings invested in local stocks. *Excess Local Weight* is the percentage of the investor's portfolio invested in stocks located in the investor's state (local stocks) minus the percentage of the "market portfolio" located in the investor's state. We take the average of excess weights across all institutions each quarter, and then report the time-series average of those quarterly averages. The quarterly averaging across institutions is either weighted equally (first row) or weighted by the total dollar value of the institution's holdings at the beginning of the quarter (second row). The sample period is from 1996 to 2008.

	Excess Local Portfolio Weight			
	PREREG	POSTREG		
	1996-1999	2000-2003	2004-2008	2000-2008
Equal-Weighted Average	2.63%	1.75%	1.13%	1.41%
Holdings-Weighted Average	0.97%	0.14%	−0.43%	−0.17%

Table 6
Performance of Institutional Investors in Local and Non-Local Stocks: Subperiod Estimates

This table reports the average performance of institutional investors' local and non-local holdings and trading, for different subperiods of our sample. For each institution with non-zero portfolio weight in local stocks, we calculate the monthly characteristics-adjusted returns of its non-local portfolio, as well as the performance differential between the local and non-local sub-portfolios. We divide each institutional investor's quarterly portfolio into 3 mutually exclusive categories: *Local HQ*, *Local* ER_{1-3}, and *Non-Local*. We exclude Local ER stocks in this table. Panel A reports the holdings-based performance of the non-local portfolio and the performance differential between local HQ portfolio and the non-local portfolio. Panel B reports the corresponding trading-based performance; trading-based performance is defined as the difference in monthly returns of the holdings snapshot at the end of the preceding quarter minus the holdings snapshot at the beginning of the preceding quarter. We report mean portfolio characteristic-adjusted returns based on Daniel, Grinblatt, Titman, and Wermers (1997) method. We compute the average values of the portfolio performance estimates across all institutions each month, and then report the time-series averages of the monthly averages. The monthly averaging across institutions is value-weighted by the total dollar value of the institution's holdings at the beginning of the quarter (for Panel A) or by the total dollar value of holdings that experience net change in portfolio position (for Panel B). The non-local (NL) performance is reported in the first row of each panel, while the differences in performance between local HQ and non-local are reported in the remaining rows. The t-statistics reported in parentheses below the Non Local performance estimates (i.e., the first row in each panel) are for the null hypothesis of zero Non-Local performance. The t-statistics below the performance differential estimates between the local HQ and non-local stocks are for the null hypothesis of no difference in mean performance across local HQ and non-local institutional sub-portfolios. Both types of t-statistics are adjusted for autocorrelation and heteroscedasticity following Newey-West (1987).

Panel A: Holding Performance

		PREREG	POSTREG	
Sample Period:	All	1996–1999	2000–2003	2004–2008
	(1)	(2)	(3)	(4)
Non-Local (NL)	0.096	0.113	0.165	0.027
(t-stat)	(1.11)	(1.40)	(1.67)	(0.18)
Differences in Performance between Local and Non-Local				
Local HQ minus NL	−0.004	0.129	−0.062	−0.065
(t-stat vs. NL)	(−0.03)	(1.06)	(−0.42)	(−0.58)

Panel B: Trading Performance

		PREREG	POSTREG	
Sample Period:	All	1996–1999	2000–2003	2004–2008
	(1)	(2)	(3)	(4)
Non-Local (NL)	0.076	0.148	0.064	0.028
(t-stat)	(1.57)	(1.78)	(0.88)	(0.39)
Differences in Performance between Local and Non-Local				
Local HQ minus NL	0.017	0.154	0.000	−0.079
(t-stat vs. NL)	(0.44)	(1.87)	(0.01)	(−0.49)

Table 7
Local Analyst Coverage Regression Estimates

This table reports the estimates from local coverage regressions of sell-side equity analysts. The dependent variable is the excess coverage of local stocks, which is the difference between the fraction of local stocks in an analyst's stock coverage portfolio and the fraction of local stocks that the analyst can potentially cover within the CRSP universe. In the first two columns, we use equal-weighted fractions, while in the last two columns, we use value-weighted fractions. The independent variables include indicator variable for POSTREG (2000 onward), analyst characteristics (tenure, past performance, and number of firms covered), and an indicator variable for analysts employed by prestigious brokerage houses. All specifications include state fixed effects. The definitions of all variables are provided in the Appendix. Following Petersen (2009), the t-statistics reported in parentheses are based on standard errors clustered by year and state. The sample period is from 1996 to 2008.

Dependent Variable: Excess Coverage of Local Stocks (in %)

	Equal-Weighted		Value-Weighted	
Independent Variable	(1)	(2)	(3)	(4)
POSTREG	−3.48	−4.76	−3.07	−4.48
	(−5.23)	(−6.25)	(−4.91)	(−6.84)
PBROKER	−1.62	−4.14	−1.25	−4.02
	(−2.59)	(−4.20)	(−1.8)	(−5.28)
PBROKER × POSTREG		3.77		4.14
		(3.70)		(3.98)
HIGHPERF	0.09	0.10	0.9	0.92
	(0.10)	(0.11)	(0.91)	(0.93)
TENURE	−0.06	−0.06	0.11	0.12
	(−0.3)	(−0.27)	(0.37)	(0.4)
NFCOVER	−0.18	−0.18	−0.15	−0.15
	(−5.41)	(−5.46)	(−4.27)	(−4.31)
State FE	Yes	Yes	Yes	Yes
N	23,518	23,518	23,516	23,516
Adj. R^2	0.205	0.206	0.231	0.232
Mean of Excess Coverage	9.61	9.61	6.28	6.28

Table 8
Local Forecast Accuracy Regression Estimates

This table reports the estimates from forecast accuracy and market reaction regressions. The dependent variable is one of the measures of analyst quarterly earnings forecast error. The independent variables include an indicator variable LOCAL and its interaction with POSTREG (2000 onward). LOCAL is set to one if the analyst and the firm headquarters are in the same state. We do not include the stand-alone regime variables since they are subsumed by the time-varying analyst fixed effects. The definitions of all variables are provided in the Appendix. Following Petersen (2009), the t-statistics reported in parentheses are based on standard errors clustered by firm and quarter. The sample period is from 1996 to 2008.

Dependent Variable: Forecast Error

Dep. Var.:	ERRMDN	ERRPCTL	DAFE		
Sample Period:	Full	Full	Full	PREREG	POSTREG
Independent Variable	(1)	(2)	(3)	(4)	(5)
LOCAL	0.92	−0.35	−0.44	−0.44	−0.02
	(2.67)	(−2.47)	(−1.65)	(−1.65)	(−0.10)
LOCAL × POSTREG	−1.06	0.22	0.42		
	(−2.46)	(1.20)	(1.32)		
Analyst × Quarter FE	Yes	Yes	Yes	Yes	Yes
N	811,669	811,669	786,605	276,729	509,876
Adj. R^2	0.156	0.164	0.121	0.103	0.149
P-value (LOCAL+LOCAL×POSTREG)	0.628	0.303	0.918		

Table 9

Local Ownership and Informed Trading: Estimates From Constant and Time-Varying Coefficients Specifications

This table reports pooled cross-sectional regression coefficient estimates and corresponding t-statistics for the relation between firm-level measures of informed trading in the year following the fiscal year end and the level of excess local institutional ownership as of the fiscal year end. In Panels B and C this relation is conditioned on the regulatory regime. We also control for time-varying firm and state characteristics and include year as well as state fixed effects. POSTREG is an indicator variable equal to one for fiscal years ending in calendar years 2000 and onward. We interact this indicator variable with LOCOWN, but do not include the standalone variable since it is subsumed by the year fixed effects. Among the dependent variables, PIN is the probability of private information related trade from Easley, Hvidkjaer, and O'Hara (2002) model. ADJPIN and PSOS are PIN's components from Duarte and Young (2009). ADJPIN is the probability of private information related trade from the extended model in Duarte and Young (2009), while PSOS is the probability that a given trade happens during a symmetric order flow shock. Effective Spread (SPREAD) is the difference between the actual execution price and the midpoint of market quotes. We provide separate measurements of the spread around earnings announcements (SPDEARN) and excluding earnings announcements (SPDOTH). The definitions of all variables are provided in the Appendix. Following Petersen (2009), the t-statistics reported in parentheses are based on standard errors clustered by year and state. The sample is restricted to 1996 to 2004 period due to the availability of PIN components.

Panel A: Estimates Using Constant Coefficients Specifications

Dependent Variable: Subsequent Year PIN or Spread (in %)

	PIN-Based			Spreads-Based		
	PIN	ADJPIN	PSOS	SPREAD	SPDOTH	SPDEARN
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)
LOCOWN	4.267	2.337	6.122	0.351	0.348	0.385
	(9.45)	(5.28)	(11.90)	(10.65)	(10.58)	(8.45)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	12,356	12,356	12,356	35,507	35,507	35,507
Adj. R^2	0.480	0.492	0.318	0.524	0.523	0.474

Panel B: Estimates Using Time-Varying Coefficients Specifications

Dependent Variable: Subsequent Year PIN or Spread (in %)

	PIN-Based			Spreads-Based		
	PIN	ADJPIN	PSOS	SPREAD	SPDOTH	SPDEARN
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)
LOCOWN	4.258	2.442	4.621	0.466	0.466	0.463
	(8.44)	(5.47)	(6.70)	(8.07)	(8.43)	(4.57)
LOCOWN × POSTREG	0.019	−0.923	2.894	−0.173	−0.177	−0.118
	(0.02)	(−1.19)	(2.23)	(−3.33)	(−3.57)	(−1.22)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	12,356	12,356	12,356	35,507	35,507	35,507
Adj. R^2	0.480	0.513	0.319	0.525	0.524	0.474

Panel C: Estimates Using Time-Varying Coefficients Specifications Around Earnings Announcements

Dependent Variable: Spread Around Earnings Announcement (in %)

	Pre-Announcement			Post-Announcement		
	(−5:−1)	(−10:−1)	(−20:−1)	(+1:+5)	(+1:+10)	(+1:+20)
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)
LOCOWN	0.310	0.310	0.295	0.308	0.310	0.299
	(6.27)	(6.32)	(6.06)	(6.05)	(6.35)	(6.29)
LOCOWN × POSTREG	−0.156	−0.138	−0.143	−0.048	−0.055	−0.058
	(−1.86)	(−1.69)	(−1.75)	(−0.52)	(−0.62)	(−0.67)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
State Controls	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	41,001	41,007	41,009	41,055	41,059	41,060
Adj. R^2	0.412	0.437	0.453	0.432	0.454	0.462

Appendix: Variable Definitions

Ownership, Concentration, and Performance Measures

HQ State is the U.S. state or the District of Columbia in which the firm headquarters are located. *HQ Excess Ownership (LOCOWN)* is the state institutional ownership of a firm's HQ state minus that state's average institutional ownership. State Ownership is the state's institutional investors' share in the total institutional ownership. *Ownership Herfindahl* is the Herfindahl-Hirschman concentration index (HHI) of state-level institutional ownership across all U.S. states. *Ownership GCI* is the concentration of state-level institutional ownership across all U.S. states adjusted for the "natural" level of ownership concentration resulting from the geographical clustering of institutional investors. *Institutional ownership (IO)* in a firm is the total number of shares owned by all 13(f) institutions as a proportion of the total number of shares outstanding for the firm.

Information Environment Variables

Turnover (TURN) is trading volume divided by shares outstanding. *Idiosyncratic Volatility (IVOL)* and *Idiosyncratic Skewness (ISKEW)* are calculated from residuals of annual market-model regressions of monthly stock returns. *Major Auditor (MAJAUD)* is an indicator variable equal to one if the firm hires a major auditor (AU code 01 to 08 in Compustat) in the relevant fiscal year. *Analyst Coverage (ANCOV)* is an indicator variable equal to one if the firm is followed by at least one equity analyst during the relevant fiscal year according to IBES records. *Number of Analysts (NUMANA)* is the number of unique equity analysts providing earnings forecasts or recommendations for the company stock during the relevant fiscal year. *Absolute Discretionary Accruals (ABSDACC)* is the absolute value of the residual from the modified Jones model of discretionary accruals estimated separately for each year/two-digit SIC code combination, following Dechow, Sloan, and Sweeney (1995). *Local Analyst Coverage (LOCANCOV)* is an indicator variable equal to one if the firm is followed by at least one equity analyst located in the firm's HQ state during the relevant fiscal year. *LOCAL* is a dummy variable that is set to one if the firm headquarters and the analyst are located in the same state and, zero otherwise. It is defined in an analogous manner for economically relevant states.

Other Firm Characteristics and Local Attributes

Log(Market Cap) (MCAP) is the stock price multiplied by the number of shares outstanding. *Book-to-Market (BM)* is the ratio of book and market equity. *Financial Leverage (FINLEV)* is defined as (Total Long Term Debt + Preferred Equity Liquidation Value)/(Market Value of Equity at Fiscal Year End + Total Long Term Debt + Preferred Equity Liquidation Value).

Firm Age (AGE) is the number of years since a firm's first appearance in the CRSP database (i.e., since it becomes a publicly traded firm). *6m Lagged Return (RET6M)* is the raw stock return in the six months leading up to the beginning of the institutional ownership measurement quarter. *Stock Price (PRICE)* is the stock price at the beginning of the institutional ownership measurement quarter. Following Kumar (2009), *Lottery-Type Stock (LOTT)* is an indicator variable for firms that are not in the bottom third of volatility, the bottom third of skewness, or the top third of price. Among the local attributes, *Education (EDU)* is the fraction of college graduates in the state. *Population Density (POPDEN)* is the state's population divided by its land area. *Catholic-Protestant Ratio (CPRATIO)* is the ratio of Catholic adherents to Protestant adherents in the state. *Religiosity (REL)* is the fraction of religious adherents in the state. *Republican (REPUB)* is the percentage of the state's registered voters that voted for the presidential candidate from the Republican party in the last election.

Microstructure Variables

PIN is the probability of private information related trade from Easley, Hvidkjaer, and O'Hara (2002) model. *ADJPIN* and *PSOS* are PIN's components from Duarte and Young (2009). ADJPIN is the probability of private information related trade from the extended model in Duarte and Young (2009), while PSOS is the probability that a given trade happens during a symmetric order flow shock. *Effective Spread (SPREAD)* is the difference between the actual execution price and the midpoint of market quotes. We measure the spread in the [−1:+1] window around earnings announcements (SPDEARN) and excluding earnings announcements (SPDOTH).

Analyst-Related Measures

High Performance (HIGHPERF) is the fraction of analyst forecasts in the past year with below-median forecast errors. *Tenure (TENURE)* is the number of quarters since the analyst's first appearance in the I/B/E/S dataset. *Prestigious Broker (PBROKER)* is an indicator variable that takes the value of one if the analyst is employed by a prestigious brokerage house. *Number of Firms Covered (NFCOVER)* is the number of stocks covered by the analyst in a particular quarter. The *excess coverage of local stocks (EXCOVLOC)* is the difference between the fraction of local stocks in an analyst's stock coverage portfolio and the fraction of local stocks that the analyst can potentially cover within the CRSP universe. Equal-weighted excess local coverage is defined as the number of covered local stocks divided by the number of all covered stocks minus the number of available local stocks divided by the number of all stocks. Value-weighted excess local coverage is defined as the total market capitalization of covered local stocks divided by the total market capitalization of all covered stocks minus the total market capitalization

of all local stocks divided by the total market capitalization of all stocks. *Error Below Median (ERRMDN)* is an indicator variable that is set to one if the analyst forecast error is below the median forecast error of all analyst forecasts for the same firm-quarter. *Error Percentile (ERRPCTL)* is the percentile ranking of a given analyst forecast error within the universe of all forecasts for the same firm-quarter. Following Malloy (2005), *demeaned absolute forecast error (DAFE)* is calculated as the absolute forecast error (AFE) for an analyst's forecast of a particular firm's annual earnings minus the mean absolute forecast error for that earnings report. Absolute forecast error is calculated as the absolute value of an analyst's latest forecast, minus the actual earnings, as a percentage of the stock price one-year prior to the beginning of the fiscal year.