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*Economic Consequences of SEC  
Disclosure Regulation*

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# Economic Consequences of SEC Disclosure Regulation

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## Abstract

This paper examines the economic consequences of SEC disclosure regulation. We exploit a recent regulatory change mandating firms on the OTC Bulletin Board to comply with the reporting requirements under the Securities Exchange Act of 1934. This change substantially increases the amount and enforcement of required disclosures for firms that previously did not file with the SEC. In this unique setting, we document that the imposition of SEC disclosure requirements and enforcement results in significant costs for smaller firms, which are essentially forced off the OTCBB. However, SEC disclosure regulation also has significant benefits. Firms already filing with the SEC prior to the rule change experience positive stock returns and permanent increases in market liquidity. This evidence is consistent with positive externalities from disclosure regulation. Moreover, newly compliant firms exhibit significant increases in market liquidity upon compliance consistent with the notion that commitment to higher-quality disclosures increases market liquidity.

*JEL classification:* G18, G38, K22, G39, M44, G14

*Key Words:* *Mandatory disclosure, Enforcement, Externalities, Over-the-counter market, Liquidity, Listing choices, Eligibility rule*

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## 1. Introduction

Extensive SEC disclosure regulation and associated enforcement are often viewed as cornerstones of US capital markets (e.g., Sutton, 1997; Levitt, 1998). However, there is surprisingly little empirical evidence on the alleged costs and benefits of disclosure regulation (see also Healy and Palepu, 2001). Moreover, the economic consequences of mandatory disclosures are theoretically far from clear and heavily debated (e.g., Coffee, 1984; Easterbrook and Fischel, 1984).

We contribute evidence to this debate by examining firm-specific consequences of SEC disclosure regulation for a sizable and previously unregulated US market segment.<sup>1</sup> We exploit a recent regulatory change mandating firms quoted on the Over-The-Counter Bulletin Board (OTCBB) to comply with the reporting requirements under the 1934 Securities Exchange Act. We study firms' responses and market reactions, but do not attempt to evaluate the regulator's decision or to measure the net social costs or benefits.

We find that the imposition of SEC disclosure requirements forces a substantial number of firms into a less regulated market, at significant costs in terms of market value and liquidity. Only a small set of firms finds it optimal to newly adopt SEC disclosures, thereby avoiding removal from the OTCBB. Even though these firms experience significant increases in liquidity upon compliance, stock returns suggest that the regulatory change is costly to these firms. Our evidence further suggests that these two effects create positive externalities for OTCBB firms that were already compliant with SEC disclosure requirements, possibly due to informational or liquidity spillovers or due to an enhanced reputation of the OTCBB.

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<sup>1</sup> By disclosure regulation, we mean mandatory reporting obligations as a prerequisite for trading in a particular market *and* the enforcement of these obligations. Such regulation may take place at the exchange level in the form of (private) listing requirements *or* at the country level in the form of (public) disclosure laws.

On January 4, 1999, the SEC approved the eligibility rule,” which required all domestic OTCBB firms to comply with the reporting obligations under the 1934 Act by a firm-specific phase-in date between July 1999 and June 2000. Prior to this rule, firms could be traded on the OTCBB without SEC filing if they (1) had \$10 million or less in total assets *or* fewer than 500 shareholders and (2) had avoided registering securities under the 1933 Securities Act (see Section 2 for more details). They merely had to provide financial statements to a market maker once to initiate quotation, but not subsequently. Prior to the eligibility rule, the OTCBB quoted over 3,600 firms that did not file with the SEC. For these firms, the new rule substantially extended the disclosures required for trading in the OTCBB.

In essence, the regulatory change created three firm groups. Firms that were not filing with the SEC prior to the eligibility rule presumably did so because the costs exceeded the benefits, as they could have voluntarily filed with the SEC. By eliminating the possibility to trade on the OTCBB without filing, the eligibility rule essentially forces firms to choose their next-best alternative. Firms that do not to comply with SEC reporting are removed from OTCBB (“Noncompliant” firms). These firms have to go private or trade in the Pink Sheets, where SEC filing is not required. Firms that prefer to continue trading in the OTCBB must adopt SEC disclosures (“Newly Compliant” firms). Thus, the compliance responses of both groups, and the market reactions to them, provide evidence on firm-specific costs and benefits from the imposition of mandatory disclosures. Firms that were already subject to SEC reporting obligations, either due to their size and number of shareholders or due to prior securities offerings under 1933 Act, were not directly affected by the eligibility rule (“Already Compliant” firms). These firms provide an opportunity to study externalities of disclosure regulation.

First, we analyze firms' compliance responses to the eligibility rule. We document that over 2,600 (or 74%) of the firms not previously filing with the SEC did *not* comply with the required disclosures and hence were removed from the OTCBB. Thus, for the vast majority of OTCBB firms, the costs of mandatory SEC disclosures appear to outweigh the benefits. We also examine firm characteristics, such as size, ownership structure, outside financing needs, and profitability, which are typically associated with the costs and benefits of disclosures (e.g., Lang and Lundholm, 1993 and 2000). As expected, we find that Noncompliant firms are smaller, have lower leverage, and higher profitability than Newly Compliant firms. These results have to be interpreted cautiously as data availability prior to the eligibility rule is limited, but they suggest that an important consequence of mandatory SEC disclosures is to push smaller firms with lower outside financing needs into a less regulated market, rather than to compel them to adopt higher disclosure standards.

Next, we examine stock returns around the announcement and implementation of the eligibility rule. If the market anticipates the economic consequences of the disclosure requirements, returns around the key announcement dates provide evidence of firms' net costs or benefits. Similarly, returns around the rule's phase-in dates, when the remaining residual uncertainty about firms' compliance is resolved, reflect the market's assessments of the costs or benefits resulting from the imposition of SEC disclosures.

We find positive abnormal returns for Already Compliant firms around key announcements and phase-in dates, suggesting positive externalities from the imposition of mandatory disclosures on other firms. Newly Compliant firms exhibit significantly lower returns than Already Compliant firms at the key announcement dates. This result is consistent with our argument that the eligibility rule forces Newly Compliant firms to adopt their second-best

alternative, as they can no longer trade on the OTCBB without filing with the SEC.

Noncompliant firms exhibit even lower returns around the key announcement dates. Moreover, they experience significantly negative abnormal returns upon removal from the OTCBB. These findings indicate that the imposition of disclosure requirements has significant costs for those firms forced into a less regulated and less automated market.<sup>2</sup>

Finally, we examine changes in firms' market liquidity around the phase-in of the eligibility rule. This analysis corroborates the results for firms' compliance responses and stock returns and aids their interpretation. We find that Newly Compliant firms experience significant increases in liquidity, which are significantly larger than for all other firms. However, the liquidity benefits do not imply that imposing SEC disclosures made these firms better off; the announcement returns and the non-disclosure strategy prior to the eligibility rule suggest the opposite. Noncompliant firms experience significant and sustained decreases in all liquidity measures after their removal from the OTCBB, consistent with the return results. Already Compliant firms exhibit significant and sustained increases in liquidity for two of three measures. This finding is also consistent with the return results and suggests liquidity spillovers and improved market reputation as possible sources of externalities.

This paper contributes to a fairly limited empirical literature on the economic consequences of disclosure regulation.<sup>3</sup> According to Healy and Palepu (2001, p. 415), empirical research on disclosure regulation is "virtually non-existent." Notable exceptions are the early studies by

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<sup>2</sup> The Pinks Sheets did not offer a web portal with electronic quotes until mid-2000, suggesting lower liquidity and price transparency than the OTCBB. Our evidence of liquidity changes around the move from the OTCBB to the Pink Sheets is consistent with this interpretation.

<sup>3</sup> There is, however, a vast literature on the economic consequences of mandated changes in accounting standards (Watts and Zimmerman, 1986; Fields, Lys, and Vincent, 2001). This literature, along with capital-markets research in accounting, generally focuses on the relation between reported accounting numbers and stock returns (or prices), thereby providing evidence on whether the required numbers add value to investors (see also Kothari, 2001). However, these studies occur within the already-rich SEC disclosure environment, whereas our study analyzes the imposition of SEC disclosure requirements.

Stigler (1964) and Benston (1969 and 1973), investigating the benefits of the Securities Acts and concluding that the statutes were of no apparent value to investors. These studies have been heavily debated and challenged (see Coffee, 1984, for a survey). We examine a recent expansion of disclosure regulation and show that the imposition of SEC disclosure requirements results in significant costs and benefits to firms. Moreover, we provide some evidence on the existence of externalities, which are commonly viewed as a justification for regulation.

Our paper also contributes to the understanding of the OTC Bulletin Board, a market that has been largely ignored by prior research.<sup>4</sup> The only paper to examine this market as a whole is Luft et al. (2000). They find that, prior to the eligibility rule, OTCBB securities yield lower returns with higher risk than securities listed on major exchanges. They attribute these results to the lack of information and liquidity in the OTCBB. Our paper provides evidence on the liquidity of this market and how it changes around the introduction of disclosure requirements.

The next section reviews prior work on the economics of disclosure regulation and explains how the OTCBB setting can be exploited to contribute to this literature. Section 3 develops our hypotheses. In Section 4, we explain the construction of the key samples and examine firms' listing responses to the eligibility rule. Section 5 discusses the results for firms' stock returns. Section 6 reports the findings for changes in liquidity measures. Section 7 concludes the paper.

## **2. The Economics of Disclosure Regulation and the Institutional Setting**

### *2.1 Theory and evidence*

Why should firms be mandated to disclose information? Firms have incentives to provide information voluntarily because they ultimately bear the cost of withholding it. In the absence of

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<sup>4</sup> Studies on cross listings in the US sometimes include foreign firms trading on the OTCBB (e.g., Botosan and Frost, 1998).

frictions, full disclosure prevails without regulation (e.g., Grossman and Hart, 1980). If disclosure is costly, firms may withhold some information (e.g., Verrecchia, 1983). But even in this case, the optimal disclosure level can be achieved without regulation; firms simply trade off the costs and benefits of disclosure. Thus, the role of mandatory disclosure is far from obvious.

One potential role of mandatory disclosure is to serve as a commitment device. Disclosures reduce the firm's cost of capital, but only if they are credible and not self-serving. The problem is that firms have incentives to withhold or manipulate information in certain situations (e.g., poor performance). Thus, to effectively reduce the cost of capital, firms have to commit to disclose information in a truthful and non-selective manner (e.g., Verrecchia, 2001). Mandatory disclosures bind firms to reveal information regardless of its realization, provided that they are properly enforced. Such requirements can be provided privately, for instance, by an exchange in the form of a listing agreement, or publicly by a regulatory act.<sup>5</sup> As our setting involves private regulation endorsed by a public regulator, we cannot distinguish between the two alternatives and use the term 'disclosure regulation' for both of them.<sup>6</sup>

Externalities provide a second rationale for mandatory disclosure regimes. They arise whenever the social and private values of information or disclosure differ. In such a case, firms trading off the private costs and benefits do not provide the socially optimal level of disclosure. Thus, mandating firms to provide certain information can be desirable.

Prior work provides several hypotheses on the existence of externalities. Hirshleifer (1971) argues that private information acquisition for speculative gains in securities markets is socially

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<sup>5</sup> The key point is that firms *voluntarily* seek such commitment devices. Huddart et al. (1999) show that exchanges competing for liquidity have incentives to set tough disclosure standards and generally do not engage in a 'race to the bottom'.

<sup>6</sup> Glaeser et al. (2001) argue that the two alternatives differ mainly in their enforcement mechanism. Exchange rules are enforced by private litigation in courts whereas securities regulation is enforced by a regulatory agency. They provide evidence that private and public enforcement can yield different outcomes.

wasteful. Disclosure can preempt these activities and mitigate the overproduction of information. On the other hand, private monitoring creates free-rider problems by conferring uncompensated benefits on other investors. The resulting underproduction of monitoring can also be mitigated by disclosure, as it reduces the costs of information acquisition (e.g., Coffee, 1984).

Dye (1990) and Admati and Pfleiderer (2000) argue that firms' disclosures have positive externalities in the form of information transfers and liquidity spillovers. With correlated firm values or cash flows, information disclosed by one firm can be useful in valuing other firms and increase investors' willingness to hold positions in other firms. But disclosures can also have negative externalities if investors (or analysts) follow only a limited number of firms, e.g., due to information processing costs. Fishman and Hagerty (1989) argue that, in this case, increases in disclosure can attract investors away from other firms, resulting in lower price efficiency in imperfectly competitive markets.

The preceding discussion suggests that the effects of disclosure regulation are complex. They are further complicated by the fact that firms have various ways to respond to disclosure regulation. For instance, firms can choose to trade in a different market, go private, or not go public. For these reasons, empirical studies of firms' responses and market reactions to disclosure regulation provide valuable input into regulatory decisions. Early studies by Stigler (1964) and Benston (1969 and 1973) empirically investigate the benefits of the 1933 and 1934 Acts and conclude that the statutes were of no apparent value to investors. These findings have been repeatedly challenged (e.g., Friend and Herman, 1964; Seligman, 1983). Coffee (1984) reviews the (inconclusive) debate and argues that the focus should be shifted to contemporary securities regulation as much has changed since the 1930s.

To address this void, our study exploits a recent regulatory act in the over-the-counter markets that affected more than 3,500 firms. As the next section shows, our setting provides an opportunity to study the aforementioned key aspects of disclosure regulation: market reactions, firms' responses, and externalities.

## 2.2 *The Over-the-Counter Bulletin Board Market*

The OTC Bulletin Board (OTCBB) is an electronic quotation medium for small-cap securities not traded on NASDAQ or listed on one of the national exchanges. The OTCBB is operated and regulated by the National Association of Securities Dealers (NASD) and it provides real-time quotes, last-sales prices, and volume information. It was established in June 1990, partially in response to the Penny Stock Reform Act of 1990. This Act mandated the creation of an electronic system to provide widespread quotation and trade information, thereby increasing price transparency in the OTC market. By 1998, more than 6,000 domestic issues were quoted on the OTCBB with an average daily trading volume over \$200 million and an estimated market capitalization of over \$50 billion. Thus, the OTCBB represents a sizeable segment of the U.S. securities market.

In contrast to the NASDAQ market, there are no listing requirements or quotation fees on the OTCBB. Firms can simply approach a market maker for sponsorship. Market makers are prohibited from accepting any remuneration for their quotation services from the issuers. The OTCBB is also distinct from the Pink Sheets, another over-the-counter market segment, which until recently did not provide electronic quotations. The Appendix provides a summary comparison of the market characteristics, disclosure requirements, and enforcement rules of these three markets.

Before 1999, issuers in the OTC markets did not have to file periodic financial reports with the SEC if they (1) had never registered securities under the 1933 Act and (2) were below the thresholds specified in Section 12(g) of the 1934 Act. Firms with security offerings registered under the 1933 Act are mandated by Section 15(d) to comply with the periodic reporting obligations of the 1934 Act.<sup>7</sup> Section 12(g) stipulates that issuers with total assets exceeding \$10 million *and* a class of security held by more than 500 persons on the last day of the fiscal year must register their securities under the 1934 Act.

Exemptions from registration under the 1933 Act, as well as size and ownership limits in Section 12(g), implied that over half of the companies quoted on the OTCBB in 1998 were not subject to SEC reporting requirements.<sup>8</sup> For these firms, the only reporting requirements stemmed from SEC Rule 15c2-11. This rule mandates that any broker/dealer initiating a quotation obtain current financial reports (e.g., balance sheet and income statement) from the issuer. After 30 days, the stock becomes eligible for the “piggyback” exemption, which allows other market makers (including the initiating market maker) to issue quotes without having updated financial information. For this reason, financial reports were generally not publicly available for those firms not required to file with the SEC (*WSJ*, 12/9/1997).<sup>9</sup> Moreover, Rule 15c2-11 does not require financial reports to be audited and demands far fewer disclosures than SEC Form 10-K.

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<sup>7</sup> Firms can use various exemptions to avoid registration under the 1933 Act. For instance, rule 504 of Regulation D allows issuers to sell up to \$1 million of stock *without* registration under the 1933 Act.

<sup>8</sup> See, e.g., *WSJ*, 1/7/1999 and SEC Adopting Release 34-40878. Note that the size and ownership criteria only apply at the last day of the fiscal year. Thus, exceeding the limits during the fiscal year is irrelevant, which may allow issuers to circumvent registration. See Loss and Seligman (2001, p. 444-446).

<sup>9</sup> We confirmed this claim in interviews with officials from NASDAQ, the SEC and several OTC market makers. Note further that any availability of information prior to the eligibility rule biases our results against finding significant reactions and changes.

In the late 1990's, the SEC and the NASD jointly considered improving the disclosure of financial information by OTCBB firms. There was a resurgence of OTC securities fraud and the relatively unregulated OTCBB was perceived as exacerbating the problem (*WSJ*, 9/4/1997).<sup>10</sup> In addition, the NASD was concerned that investors could confuse the OTCBB with its more highly regulated NASDAQ market and that real-time quotations gave unwary investors a false sense of reliability, particularly considering the lack of disclosure requirements (*WSJ*, 12/9/1997). In February 1998, the NASD Board of Governors proposed to restrict quotations on the OTCBB to those domestic companies that report current financial information to the SEC, banking, or insurance regulators. After public comment, the so-called "eligibility rule" was approved by the NASD in May 1998 and submitted to the SEC for approval.

On January 4, 1999, the SEC approved the eligibility rule as amendments to NASD rules 6530 and 6540. It limits quotations on the OTCBB to securities of issuers that make current filings pursuant to Sections 13 and 15(d) of the 1934 Act, and securities of depository institutions and insurance companies that make filings under the Act, but with the appropriate regulatory agencies. The eligibility rule implies that OTCBB companies have to file annual reports using Form 10-K as well as quarterly and current reports using Form 10-Q and 8-K, respectively. Moreover, the filings are made easily accessible through the SEC's EDGAR database. Thus, the eligibility rule considerably increases mandatory disclosures for firms that were previously not filing with the SEC. In addition, it creates civil liabilities under Section 18 and brings firms' reporting under the auspices of the SEC enforcement (e.g., Section 15(c)(4) compliance orders).

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<sup>10</sup> State regulators estimate that investor losses due to penny stock abuses amounted to \$6 billion annually during the 1990's (*WSJ*, 9/22/1997). Anecdotal evidence also suggests that there is a significant number of small retail investors trading in the OTC markets.

Thus, the eligibility rule substantially increases private and public enforcement of disclosures (see also Appendix).

The eligibility rule became immediately effective for new OTCBB quotations, but provided a phase-in period for issuers with securities quoted as of January 4, 1999. Each issuer was assigned a phase-in date between July 1999 and June 2000 based on its ticker symbol as of January 4, 1999. Thus, the implementation schedule gave companies between 6 and 18 months after the rule's approval to become current in their filing with the SEC. Between 100 and 300 firms were tested for compliance at each phase-in date, and all but the first three months had two phase-in dates. Filing status was reviewed in an initial compliance test 30 days prior to the phase-in date (60 days prior for banks and insurance companies). If the NASD did not have information establishing that the issuer was current in its filings with the SEC, it appended an "E" as fifth character to the ticker symbol to flag non-compliance with the eligibility rule. If the company subsequently became compliant with the eligibility rule, the "E" was eliminated; otherwise, the issuer was removed from the OTCBB on the day after the phase-in date.

### **3. Hypothesis Development and Research Design**

As explained in the previous section, the eligibility rule mandates a substantial increase in the amount and enforcement of required disclosures for many OTCBB firms. The rule eliminates the possibility to trade on the OTCBB *without* making the required disclosures, forcing firms to either comply with SEC disclosure requirements or to leave the OTCBB. In responding to the rule, firms are expected to tradeoff the costs and benefits of mandatory disclosures, SEC scrutiny and enforcement, and extended legal liability. Thus, firms' compliance responses likely reflect these tradeoffs. Similarly, returns around the rule's announcement and implementation provide evidence on the net costs or benefits to OTCBB

firms. An analysis of market liquidity provides evidence on the sources of those costs and benefits and, hence, aids our interpretations of the compliance and return results.

We begin by considering how different groups of firms are affected by the eligibility rule. Some firms were already filing with the SEC and, hence, were not directly affected by the eligibility rule. We call them Already Compliant firms. This group should only be affected if disclosure regulation results in externalities. Among the firms that previously did not file with the SEC, there are likely to be firms for which compliance is too costly. These firms are expected to be removed from the OTCBB and to trade in the Pink Sheets (henceforth, Noncompliant firms). Finally, there may be firms that adopt SEC disclosures for the first time. These Newly Compliant firms could have voluntarily filed with the SEC before the rule change, if it had been beneficial to them. Thus, the fact that these firms previously did not file with the SEC suggests that even for these firms the costs of SEC disclosures exceed the benefits. Trading in the OTCBB *with SEC disclosures* is likely to be their next-best alternative and preferred to trading in the Pink Sheets *without* such disclosures, which is what compels these firms to expand their disclosure.<sup>11</sup> Thus, we expect three main groups of firms to emerge in response to the eligibility rule.<sup>12</sup>

Next, we develop predictions how firms' compliance responses relate to firm characteristics. The disclosure literature suggests firm size, ownership structure, financing needs, firm profitability, and industry membership as key determinants of (voluntary) corporate disclosures

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<sup>11</sup> Such a preference ranking likely exists for the marginal firms that are "sitting on the fence" with respect to voluntarily adopting SEC disclosures and likely arises for some firms if the imposition of disclosure requirements confers positive externalities on all firms in the OTCBB market.

<sup>12</sup> Firms could also go private or "list up" to the NASDAQ or AMEX. We find that such responses are rare. Fewer than 30 went private or listed up between introduction of the eligibility rule and 60 days after firms' compliance date. These groups are small presumably because there is a market below the OTCBB (i.e., the Pink Sheets) and because the markets above the OTCBB have *additional* listing requirements.

(e.g., Lang and Lundholm, 1993 and 2000; Healy and Palepu, 2001). We expect that these factors also determine whether OTCBB firms perceive the required SEC disclosures as having net benefits or costs and, hence, should explain firms' compliance responses to the eligibility rule. Specifically, we expect Noncompliant firms, which are forced to trade in the Pink Sheets, to be smaller, have more concentrated ownership, lower financing needs, and higher profitability than Newly Compliant firms, which continue to trade in the OTCBB.<sup>13</sup>

Next, we turn to our predictions for the stock return tests. Assuming that the market anticipates the economic consequences of the eligibility rule, as well as firms' responses, returns around the key news announcements of the rule provide an initial measure of the net costs and benefits to firms. Returns around the implementation dates provide updated measures at a time when the residual uncertainty about firms' compliance is resolved.

Already Compliant firms should not exhibit abnormal returns in the absence of externalities. Thus, positive or negative returns likely reflect externalities from the imposition of SEC disclosure regulation on previously unregulated firms. We expect Noncompliant firms to be adversely affected by the eligibility rule. Even though noncompliance is their preferred disclosure strategy, these firms are forced into the Pink Sheets, which at the time did not offer electronic quotations and generally had a lower reputation (see also Appendix). Newly Compliant firms are also forced to adopt their second-best alternative, as their disclosure strategy prior to the rule suggests that they preferred to trade in the OTCBB without SEC disclosures. Thus, we expect these firms to be negatively affected as well. For both groups of firms, positive externalities of disclosure requirements such as informational spillovers would counteract the

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<sup>13</sup> Note that the relation with profitability is less apparent because corporate governance benefits of disclosure and the existence of larger private control benefits for non-disclosing firms suggest the opposite sign.

negative reaction. But as both groups are forced into their second-best alternative, they are expected to exhibit lower returns than the Already Compliant firms.

Finally, we form predictions for the market liquidity tests. As Noncompliant firms are forced into a market without electronic quotations, they are expected to exhibit lower liquidity. Newly Compliant firms substantially increase their disclosures. Prior literature suggests that increased disclosure reduces information asymmetries and increases market liquidity (Leuz and Verrecchia, 2000; Healy and Palepu, 2001). Thus, we expect Newly Compliant firms to experience significant increases in liquidity. Market liquidity for Already Compliant firms should be unchanged, unless externalities manifest in positive liquidity changes. For instance, an enhanced OTCBB reputation can increase investors' willingness to trade. Similarly, increased disclosure by Newly Compliant firms can curb private information acquisition for all firms in the market and, hence, result in liquidity spillovers. Alternatively, firms increasing their disclosure could attract investors away from Already Compliant firms not changing their disclosure, resulting in a negative externality. Whether externalities are positive or negative is ultimately an empirical issue. However, irrespective of the sign and magnitude of the externalities, we expect Newly Compliant firms to exhibit the most favorable change in liquidity due to their increased commitment to disclosure. Noncompliant firms should exhibit the least favorable change because they move to a less liquid market. Already Compliant firms should be located between the two groups as they are only affected by any externalities.

#### **4. Evidence on firms' compliance responses**

##### *4.1 Listing statistics and key compliance samples*

We collect data on firms quoted on the OTCBB from its website ([www.otcbb.com](http://www.otcbb.com)). As of January 4, 1999, there were 6,513 securities quoted on the OTCBB. These securities included

warrants, units, preferred stock, and foreign securities. Because the eligibility rule applied only to primary domestic issues, these securities were dropped from the sample, leaving a sample of 6,096 domestic common stock issues. Of this list, 483 were found to be inactive and removed by the OTCBB prior to the phase-in of the eligibility rule. This left a sample of 5,613 firms listed on the OTCBB that were subject to the eligibility rule phase-in schedule (see Table 1).

The OTCBB website has an archive of daily lists of additions, deletions, changes in names and/or tickers, and revisions to prior daily lists dating back to March 1998. Accompanying the deletions are the reasons for the delisting, the new exchange the security will trade on (if applicable), and a new ticker. We use these daily lists to obtain dates and reasons for all changes in status of our original sample firms. The daily lists also include new additions to the market. All of these firms were subject to the eligibility rule upon listing.

Table 1 presents the number of sample firms still trading on the OTCBB as of June 2001 and the delisting reasons for those firms that exited the OTCBB. Of the 5,613 firms in the January 4, 1999 sample, only 1,920 (34%) are still trading on the OTCBB. The majority of firms (59%) were delisted for noncompliance either with the eligibility rule (3,190 during phase-in, 399 after) or with Rule 15c, which requires that firms have an active market maker (99 firms). Upon delisting, most of these firms moved to the Pink Sheets of the National Quotations Bureau. In fact, the Pink Sheets doubled its number of quoted securities from around 3,000 to more than 6,000 due to the delistings from the OTCBB.<sup>14</sup> Of the firms that moved down to the Pink Sheets, 361 firms subsequently complied with the eligibility rule and rejoined the OTCBB. The

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<sup>14</sup> See, e.g., Smartmoney.com, "Skid Row for Stocks", Dow Jones Newswire, 10/13/1999. In response to the large number of delistings from the Bulletin Board, the National Quotations Bureau created an electronic quotation service for their Pink Sheets. A web portal was launched in June 2000, from which investors can obtain quotes with a 15-minute delay ([www.pinksheets.com](http://www.pinksheets.com)).

remainder of the firms leaving the OTCBB moved either to the NASDAQ, AMEX or NYSE (190; 3%), were acquired, liquidated, or taken private.

Table 2, Panel A, reports statistics for the phase-in of the eligibility rule. It shows that 33% of the 5,613 issuers reviewed (1,814 firms) passed the initial compliance test. The remaining 67% failed the initial test and had an “E” added to the end of their ticker symbol. Between the initial compliance test and the phase-in date, 609 initial-fail firms became compliant, had the “E” removed from their ticker symbol, and continued to trade on the OTCBB. The remaining 3,190 firms (57%) were removed from the OTCBB one day after the phase-in date due to noncompliance with the eligibility rule.

Table 2, Panel B, identifies the key subsamples used in our primary tests. Newly Compliant firms (946) include all non-SEC-filers in 1998 that adopted SEC disclosure requirements because of the eligibility rule. This group consists of firms that adopted SEC filing prior to the phase-in period (435 firms), firms that failed the initial compliance test but became compliant prior to the phase-in date (404 firms), and firms that failed to comply prior to the phase-in date, but filed with the SEC within the next two months and hence were reinstated to the OTCBB (107 firms). We view these firms as late adopters. Noncompliant firms (2,682) are all non-SEC-filers in 1998 that were removed from the OTCBB and subsequently did not adopt SEC disclosures.<sup>15</sup> Already Compliant firms (1,379 firms) are issuers that were already filing with the SEC in 1998 and passed the initial compliance test. Finally, firms filing with the SEC in 1998 that did not initially pass the compliance test are either Delinquent firms, which became current in their filings only after failing the initial compliance test, or Terminated filing firms, which stopped filing with the

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<sup>15</sup> There were almost 200 firms in this group that adopted SEC filing at some point beyond the two-month cut-off and rejoined the OTCBB. Because of the length of time that elapsed after the phase-in date, these firms likely adopted SEC filing for reasons other than the eligibility rule. Note that including these firms in this subsample works against our hypotheses.

SEC at some point in 1999 and were removed as noncompliant. We delete these firms from our test because they are likely firms in financial distress and they do not fit well in any of the other groups.<sup>16</sup>

Notably, Panel B of shows that only 26% of the 3,628 non-SEC-filers in 1998 complied with the eligibility rule and remained on the OTCBB, whereas 74% of these firms moved to the Pink Sheets. These findings are consistent with our expectations. For the majority of firms, the costs of SEC disclosures appear to exceed the benefits, before and after the eligibility rule.

Finally, we use NASDAQ Small Cap firms as a benchmark sample (627 firms). Comparing Already Compliant OTCBB firms to NASDAQ Small Cap firms allows us to control for time trends and economy-wide changes in our externality tests. Both groups of firms have the same SEC filing requirements and are relatively comparable in firm size. At the end of 1998, the average (median) market capitalization of NASDAQ Small Cap firms was \$21.5 (10.9) million compared to \$8.0 (8.5) million for Already Compliant OTCBB firms.

#### 4.2 *Compliance and firm characteristics*

In this section, we examine firm characteristics for SEC filers and non-SEC-filers in 1998 and for Newly Compliant and Noncompliant firms. We use the firm's share price, market value of equity, and book value of total assets as alternative measures of firm size.<sup>17</sup> The number of shareholders is used as proxy for the firm's ownership structure. Alternative measures, such as

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<sup>16</sup> The results for the Delinquent filers tend to mirror those of the Newly Compliant firms and results for Terminated filers are similar to those of Noncompliant firms.

<sup>17</sup> We have discovered that early in the Datastream data series market values are often incorrect because the series begin with an incorrect number of total shares outstanding. To mitigate this error, we compute shares outstanding as of the last day the firm is listed on Datastream and multiply this figure by the price on a given date to get the market value. As price series are split-adjusted, this adjustment should provide a reasonable approximation of market value for any given date. Results are very similar using the unadjusted market values, but the levels of the market values were much lower.

the percentage of closely-held shares, are only available for a few sample firms. We compute the ratio of property, plant, and equipment to total assets as a measure of capital intensity. Financial leverage is measured as the ratio of long-term debt to total assets. Both capital intensity and financial leverage are meant to capture outside financing needs. Return on assets is used as a proxy for firm profitability and measured as net income over total assets. As we do not have lagged total assets, this variable may suffer from small-denominator problems. Therefore, we also determine the fraction of profitable firms; i.e., firms with positive net income. In addition, we report the percentage of banks and insurance companies in each group, as they are in regulated industries and have to provide financial information to their regulatory agencies.

We obtain financial statement and ownership data from the Global Access SEC database, Mergent's FIS Online database (previously owned by Moody's Investor Service), and Knobias, an information repository for OTC security research launched in 1999. The databases rely on firms' financial reports, either obtained directly from the firms or from their SEC filings. Of the 5,613 firms in our sample, we have some financial data for 1,991 firms from Global Access, 1,360 firms from Mergent, and 524 firms from Knobias. In addition, we hand collect data from SEC filings for 1,003 firms with missing observations. We combine the datasets to increase data availability and we delete 1% of the extreme observations on either side of the distribution (except for naturally-bounded variables). All financial and ownership data is measured as of the fiscal year end between July 1, 1998 and June 30, 1999, and hence prior to the phase-in of the eligibility rule.<sup>18</sup>

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<sup>18</sup> For a small number of firms, we have to use financial data (3%) and number of shareholders (14%) from the previous fiscal year end because data for the fiscal year end between July 1, 1998 and June 30, 1999 is missing.

Table 3 presents means and medians for various firm characteristics of SEC filers, non-SEC-filers, Newly Compliant firms and Noncompliant firms. As expected, data availability is an issue for non-SEC-filers, particularly for Noncompliant firms. This problem implies that our results likely understate the differences in firm characteristics if the hypothesized factors drive firms' compliance choices. That is, we are less likely to obtain data for firms that are smaller, have more concentrated ownership, low financing needs, and high profitability. For these reasons, our tests should be interpreted cautiously and be viewed primarily as an attempt to provide some descriptive evidence for the groups used in the subsequent analyses.

Table 3, Panel A, shows that SEC filers are significantly larger, more capital intensive, more highly leveraged and more profitable than non-SEC-filers. They also have more shareholders, which is not surprising given that Section 12(g) of the Exchange Act requires firms to file with the SEC if they have more than 500 shareholders.<sup>19</sup> Table 3, Panel A, also reports significant differences among Newly Compliant and Noncompliant firms. The former group exhibits higher market values, lower capital intensity and lower profitability. In addition, banks and insurance companies become compliant and remain on the OTCBB more frequently.

We analyze firms' compliance choices in probit models. The results are reported in Panel B of Table 3. To control for industry and timing effects, we include a bank and insurance indicator as well as a variable for the number of months from the approval of the eligibility rule on 1/4/1999 to the firm's phase-in date. We begin with share price as a size proxy because this variable is available for the majority of firms. Next, we use market value as size proxy, which is

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<sup>19</sup> The fact that 50% of the SEC filers have fewer than 500 shareholders as reported in Table 3 has several reasons. First, Section 12(g) has different entry and exit criteria. To discontinue filing, firms must either have fewer than 300 shareholders or fewer than 500 shareholders and less than \$10 million in total assets for 3 consecutive years. Second, Section 15(d) mandates periodic SEC filing (1) in the year after the security offering regardless of the number of owners and (2) for three years after the offering if the firm has more than 300, but fewer than 500 owners. Firms may also voluntarily file with the SEC. See Loss and Seligman (2001).

clearly preferable but available for fewer firms. Both proxies are positively associated with the decision to continue on the OTCBB. Subsequently, we introduce proxies for financial leverage and profitability, which further reduces sample size. Both variables are only marginally significant, but suggest that firms, which are able to raise long-term debt, and are less profitable firms are more likely to comply with the eligibility rule.<sup>20</sup> While these findings are broadly consistent with our expectations, suggesting that compliance choices reflect firms' costs and benefits of disclosure regulation, they have to be interpreted cautiously due to the sample selection issue. The next two sections examine the economic consequences of the eligibility rule using market metrics, i.e., liquidity measures and stock returns, which are more readily available.

## **5. Stock return tests**

### *5.1 Data and variables*

We obtain our return data from two sources. We collect daily price, dividend, shares outstanding, and share volume data from Thomson Financial Datastream, which follows most of the firms on the OTCBB and, more recently, many Pink Sheet firms. However, Datastream stopped following many of the Noncompliant firms in the months following their removal from the OTCBB and did not cover them again until December 2000. We augment the Datastream dataset using daily volume and price data provided by the Pink Sheets. We split-adjust the Pink Sheet price and volume series using overlapping Datastream prices after December 2000. In the final dataset, we have some return data for 5,173 sample firms.

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<sup>20</sup> Using capital intensity instead of financial leverage as proxy for financing needs yields a positive, but insignificant coefficient. We use the profitability indicator rather than return on assets, as the former is more often available and not affected by scaling problems. Using return on assets yields similar results, though less significant results. Using ranked right-hand side variables instead of deleting extreme observations yields significant probit results similar to those reported in Table 3 (for either profitability variable).

We use daily price and dividend data to compute monthly and weekly buy-and-hold returns. Because of the lack of an OTCBB market index, we construct a market index from all OTCBB firms for which we have data. Similar to Luft et al. (2000), we construct an equally-weighted index, rather than a value-weighted index, because of the difficulty in obtaining total shares outstanding, and hence market values, for OTCBB firms.<sup>21</sup> We also obtain daily return data from Datastream for NASDAQ Small Cap firms, which we use as a benchmark to assess returns of the OTCBB as a whole and those of Already Compliant firms in particular.

## 5.2 *Results for returns around dates of news announcements pertaining to the eligibility rule*

First, we examine weekly returns around key news announcements pertaining to the proposal and approval of the eligibility rule. These news announcement returns provide a measure of the market's initial assessment of the net costs and benefits for firms and for the market as a whole. We examine five key event dates. On September 4, 1997, the *Wall Street Journal* published an article detailing instances of fraud on the OTCBB, attributing part of the problem to lack of SEC disclosure requirements, and hinting at changes (*WSJ*, 9/4/1997). On December 9, 1997, the NASD Board of Governors announced that SEC filing may be required for the OTCBB and that as many as 3,400 firms could be removed (*WSJ*, 12/9/1997). On February 13, 1998, the NASD Board of Governors proposed several rule changes and approved the solicitation of comment. After the comment period and internal discussions, the NASD Board approved the proposed rule change on May 7, 1998. The SEC finally announced its approval of the eligibility rule on January 4, 1999.

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<sup>21</sup> The distribution of daily returns reveals a small number of returns greater than 500% (less than 0.001% of the distribution). An investigation of some of these returns suggests that they are likely coding errors on the part of the database. To be conservative, we delete all daily returns over 500%. In addition, because an equally weighted index is susceptible to outliers, we winsorize the return data at the 99<sup>th</sup> percentile prior to constructing the index.

Columns three and four of Table 4 present weekly returns for NASDAQ Small Cap firms and the OTCBB market as a whole on these news announcement dates. Returns are compounded from three days before the news announcement to one day after. The sample is restricted to firms with data for all five event periods. Except on the first event date, the returns for OTCBB firms are similar and not statistically different from contemporaneous returns of NASDAQ Small Cap firms. The mean cumulative return over all event dates is also similar for both markets.<sup>22</sup>

The next two columns of Table 4 report weekly raw returns for firms filing with the SEC during 1998 and for firms not yet filing with the SEC. SEC filing status is observable to the market and could serve as a signal for how firms will be affected by the proposed eligibility rule.<sup>23</sup> While SEC filers should be unaffected by the proposed rule change, their returns are not expected to be zero if the market expects externalities from the imposition of disclosure regulation. Non-SEC-filers include firms that will ultimately adopt SEC disclosure requirements and firms that will not. The returns for this group are therefore difficult to interpret as they depend also on the expected fraction of Newly Compliant and Noncompliant firms. We find that SEC filers have significantly greater returns than non-SEC-filers on four of the five event dates and cumulatively, suggesting that the market recognizes that a large number of firms in the non-SEC-filer group are adversely affected by the eligibility rule. The cumulative returns of the SEC filers are significantly greater than those of the NASDAQ Small Cap firms, consistent with the market anticipating significant externalities for these firms.

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<sup>22</sup> One issue with this comparison is that the industry composition of the tech-heavy NASDAQ Small Cap differs from the broad industry composition of the OTCBB. Thus, we also collect returns for the Russell 2000. This index is comprised of 2000 small-cap, non-OTCBB firms and hence provides a broader proxy for the market return unrelated to the eligibility rule. Its cumulative return is similar (6.1%).

<sup>23</sup> We include Delinquent and Terminated filing firms in the SEC filer group because the market may not have known at this point whether these firms would stop filing with the SEC prior to the eligibility rule.

The last three columns of Table 4 report weekly returns for Noncompliant, Newly Compliant, and Already Compliant firms. The market does not know these groups at the time of the news announcements, so the returns to these groups provide a measure of whether the market anticipates firms' ultimate compliance choices. Already Compliant firms exhibit the highest returns among all three groups, consistent with positive externalities from disclosure regulation. The cumulative returns to this group are also significantly greater than the returns of Small Cap firms. The cumulative returns of the Newly Compliant firms are significantly less than those for Already Compliant firms. This finding reflects the fact that the eligibility rule eliminated the possibility to trade on the OTCBB without significantly increasing disclosures, forcing these firms to their second-best option. The cumulative returns for Newly Compliant firms are 2.3% higher than those of Noncompliant firms, but the difference is not statistically significant. Thus, there is some evidence that the market anticipates different net costs and benefits across the two groups of firms.<sup>24</sup> However, significant uncertainty about firms' future compliance choices could attenuate the market response at the news announcement dates.

### 5.3 *Results for returns around the phase-in date*

Next, we examine market-adjusted returns for months and weeks surrounding the phase-in date to examine stock price changes in response to firms' anticipated and actual compliance choices. Market-adjusted returns are computed as buy-and-hold firm returns minus buy-and-hold returns from the equally-weighted index of all OTCBB firms.<sup>25</sup> Table 5 presents market-

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<sup>24</sup> This pattern is not consistent with a size effect as Noncompliant and Newly Compliant firms tend to be smaller than Already Compliant firms. Nevertheless, we estimate these results in a regression controlling for firm size. Returns to Already Compliant firms remain significantly greater than returns to Newly Compliant and Noncompliant firms.

<sup>25</sup> Because phase-in dates are spread out over 12 months, less than 10% of the market index in any given event month is comprised of firms that are phased-in during this month. The remainder of the index includes firms

adjusted returns for the Already Compliant firms, Newly Compliant firms, and Noncompliant firms from four months prior to the phase-in date to three months after. To tie the returns directly to the key phase-in dates, we look at weekly market-adjusted returns within the month of the phase-in date and monthly returns outside this window. With the firm-specific phase-in date defined as event date zero, weekly returns for the phase-in date are computed from day  $-3$  to day  $+1$  (see Figure 1a). During days  $-23$  to  $-19$ , which we label as the “Announcement” week, the OTCBB posts on its website which firms have not passed the initial compliance test. During days  $-18$  to  $-14$ , the “Effective ‘E’” week, firms that have failed the initial compliance tests start trading with an “E” appended to their ticker symbol. This sequence of events applies only to nonfinancial firms. For banks and insurance companies, the initial compliance test is 60 calendar days, rather than 30, prior to the phase-in date. We therefore eliminate financial firms from these tests.<sup>26</sup>

For Already Compliant firms, there are significantly positive abnormal returns in the Effective “E” week and the following week, as well as the week after the phase-in week. The returns could reflect positive externalities, although it is less clear why these externalities arise around the phase-in date of the Already Compliant firms. Alternatively, these abnormal returns could reflect the resolution of some residual uncertainty about the compliance of Already Compliant firms.<sup>27</sup>

Noncompliant firms experience significantly negative abnormal returns in the month before the announcement week and for almost every period after the Effective “E” week. Thus, most of

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that had earlier or later phase-in dates and firms that were added to the OTCBB after January 4, 1999 (and hence had to comply with the eligibility rule immediately). Thus, it is unlikely that any group of firms in event time drives the market index as a whole.

<sup>26</sup> We repeated these tests including banks and insurance companies and found similar results.

<sup>27</sup> However, in section 6.4, we split Already Compliant firms into mandatory and voluntary filers and find that the positive returns stem also from the mandatory firms, for which there is no uncertainty.

the negative returns associated with noncompliance occur only after these firms fail the initial compliance test. This finding suggests that the market did not completely anticipate the firm's intention to comply until the initial compliance test. From the Effective "E" week to three months after the phase-in date, Noncompliant firms have market-adjusted returns of around -25%.<sup>28</sup> This finding suggests that there are significant net costs to Noncompliant firms related to their removal from the OTCBB and the introduction of the eligibility rule.<sup>29</sup>

The results for Newly Compliant firms are difficult to interpret because the group combines firms that passed the initial compliance test with firms that initially failed, and it includes firms that were temporarily removed due to delayed compliance. Thus, we further split this group into three subgroups: "Pass" firms that complied prior to the initial compliance test, "Fail-Pass" firms that failed the initial review (and, hence, received an "E" on their ticker symbol) but complied prior to the phase-in date, and "Fail-Fail" firms that had not complied by the phase-in, left from the OTCBB, but rejoined after complying within the next two months (see Panel B of Table 2).

The last three columns of Table 5 report market-adjusted returns for this decomposition of the Newly Compliant group. The Fail-Pass firms experience significant negative abnormal returns of -3.8% and -3.3% in the two weeks after receiving the "E" appended to their ticker symbol, reflecting the failed initial compliance test. This negative return is recovered through positive abnormal returns in the weeks after the phase-in date. The Fail-Fail firms experience an anomalous positive significant return during the week the failure of the initial compliance test is

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<sup>28</sup> These market-adjusted returns may be overstated by the use of the OTCBB market index. Given these firms are now trading on the Pink Sheets, an index of Pink Sheet firms would be a more appropriate benchmark, but sufficient data is not available to compute a meaningful market return. However, raw returns for Noncompliant firms are generally negative over this period, indicating a loss in market value.

<sup>29</sup> This finding is consistent with negative returns in prior work on delistings (e.g., Sanger and Peterson, 1990). However, in our setting, delistings occur as a consequence of a regulatory change rather than firms becoming bankrupt or violating extant exchange listing requirements.

announced, possibly indicating that these firms disclose their intention to eventually comply with the eligibility rule during this week. Then, these firms experience a significant negative return of  $-5.8\%$  during the week prior to the phase-in date, indicating that investors price firms' noncompliance, even if it will be temporary. Subsequently, these firms do not have significant abnormal returns until two months after the phase-in date, when these firms comply and rejoin the OTCBB.

In summary, the return results are consistent with firms' compliance choices. This section suggests that market prices reflect costs and benefits to firms conditional on whether they comply with the imposed SEC disclosure requirements, and that the market recognizes positive externalities to disclosure regulation around key news announcements. The results also indicate that while some of the benefits and costs are priced at the announcements leading up to the adoption of the eligibility rule, there are still significant returns in the weeks before the firm-specific phase-in date. This finding suggests that there exists residual uncertainty about whether firms will comply until the actual phase-in date.

## **6. Tests for changes in liquidity measures**

### *6.1 Data and variables*

We examine three different proxies for liquidity and trading activity around the introduction of the eligibility rule to obtain a fairly comprehensive picture of liquidity changes. First, we analyze the percentage bid-ask spread, computed as the difference between the bid price and the ask price, divided by the midpoint. Second, we use monthly share turnover, computed as

monthly share volume divided by average total shares outstanding.<sup>30</sup> Finally, we examine the percentage of days traded during the month, calculated as the number of days in a month that a firm has nonzero volume divided by the number of trading days in the month, which may be a better proxy than share turnover in low-liquidity markets such as the OTCBB.

We obtain data on our liquidity measures from multiple sources. First, the Pink Sheets kindly provided concurrent closing bid and ask prices for two three-month intervals for most of our sample firms. We obtain bid and ask prices for NASDAQ Small Cap firms from the Trade and Quote (TAQ) database. As in the case of the return data, we collect daily volume, shares outstanding, and price data from Datastream, augmented with daily volume and price data provided by the Pink Sheets. In the final dataset, we have spread data for 3,303 sample firms and trading data for 5,173 sample firms.

## 6.2 *Results for long-term shifts in liquidity*

We first examine whether there are any permanent shifts in liquidity measures around the introduction of the eligibility rule. For percentage bid-ask spread, we compare the average spread in three-month intervals before and after the phase-in period (October – December 1998 and 2000, respectively). For share turnover and percentage of days traded, we compare monthly averages for six-month periods before and after the phase-in (December 1998 – May 1999 and December 2000 – May 2001, respectively). We use the same calendar months before and after to ensure that the results are not affected by seasonal differences. This approach also omits any

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<sup>30</sup> One problem in measuring turnover is that the beginning number of shares outstanding is often unreliable earlier in the data series. We therefore adjust shares outstanding as described in footnote 17. To further mitigate the problem, we eliminate firms with market values below \$100,000, as they are likely to result from an incorrect number of shares outstanding, and winsorize monthly share turnover at the 95<sup>th</sup> percentile to remove outliers, resulting from a small denominator. As a robustness check, we examine median monthly turnover and compute the log of monthly share volume without scaling by market value. In both cases, the results are very similar to those reported in Table 6.

abnormal and temporary liquidity effects during the phase-in period. Those changes are examined in the next section. We restrict the test to firms with at least one observation in each three-month (six-month) period to ensure the results are not driven by changes in the sample composition. Otherwise, observed liquidity patterns could be simply due to attrition of sample firms caused by the eligibility rule.

We perform this test on Already Compliant, Newly Compliant, and Noncompliant firms. We benchmark our results with the sample of NASDAQ Small Cap firms. We test for shifts in the liquidity measures with the following regression:

$$\text{Avg. Liquidity Measure}_i = \beta_1 \text{DNON}_i + \beta_2 \text{DNON}_i * \text{DPOST} + \beta_3 \text{DNEW}_i + \beta_4 \text{DNEW}_i * \text{DPOST} + \beta_5 \text{DALR}_i + \beta_6 \text{DALR}_i * \text{DPOST} + \beta_7 \text{DNQSC}_i + \beta_8 \text{DNQSC}_i * \text{DPOST} + \varepsilon_{it} \quad (1)$$

where *Avg. Liquidity Measure<sub>i</sub>* = Three-month average of percentage spread, six-month average value of monthly share turnover, or six-month average value of percentage of days traded in the month for firm *i*; *DNON<sub>i</sub>* = 1 if firm *i* is a Noncompliant firm and 0 otherwise; *DNEW<sub>i</sub>* = 1 if firm *i* is a Newly Compliant firm and 0 otherwise; *DALR<sub>i</sub>* = 1 if firm *i* is an Already Compliant firm and 0 otherwise; *DNQSC<sub>i</sub>* = 1 if firm *i* is a NASDAQ Small Cap firm and 0 otherwise; and *DPOST* = 1 if the average liquidity measure is from after the phase-in of the eligibility rule and 0 if the measure is from before.

In this specification, the coefficients on the firm indicator variables (*DNON*, *DNEW*, and *DALR*) represent the group's average level of the liquidity measure before the phase-in period. A significant coefficient on the interaction between the firm indicator variable and the *DPOST* indicator variable suggests a significant shift in the liquidity measure for that group of firms in the post-phase-in period. To ensure that market-wide movements do not explain the changes, we perform F-tests for differences in the coefficients across groups.<sup>31</sup>

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<sup>31</sup> Even though each firm serves as its own control, we estimate this regression with controls for shifts in firm size (market value), shifts in return volatility (standard deviation of monthly returns), the phase-in month, and regulated industries (banks and insurance companies). Inclusion of the first two controls is potentially problematic because changes in size and volatility could be additional consequences of the firm's compliance decision, rather than exogenous alternative explanations for changes in liquidity. Nevertheless, our results in this section remain significant when these controls are added. We present results without controls to avoid endogeneity problems and allow for an assessment of the absolute magnitude of the changes in liquidity.

Table 6 presents the results of this regression. The coefficient on the incremental level of liquidity in 2000/1 for Noncompliant firms (*DNON\*DPOST*) is significantly positive in the bid-ask spread regression, and significantly negative in the turnover and percent of days traded regressions. Thus, Noncompliant firms exhibit significantly lower liquidity across all measures after the phase-in period, which is consistent with our expectation of lower liquidity in the Pink Sheets. The changes appear also economically significant, as the incremental coefficients indicate a 12% increase in the percentage spread and an over 50% decline in share turnover. The F-tests indicate that the changes in liquidity measures for Noncompliant firms are significantly different from the changes for the other groups. These findings suggest economically important costs from the imposition of SEC disclosure regulation.<sup>32</sup>

For Newly Compliant firms, the coefficient on the incremental level of liquidity in 2000/1 (*DNEW\*DPOST*) is significantly negative for the percentage spread and significantly positive for the trading proxies. Moreover, the magnitude of the changes is larger than for the other groups. These findings are consistent with the substantial improvements in disclosure of Newly Compliant firms. F-tests show that prior to the eligibility rule, Newly Compliant firms have significantly higher spreads and fewer days traded than Already Compliant firms. These differences become insignificant after the phase-in period. Thus, Newly Compliant firms not only experience dramatic increases in liquidity after adopting SEC disclosure regulation, but also achieve approximately the same level of liquidity as Already Compliant firms.<sup>33</sup>

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<sup>32</sup> Due to the low stock prices of many OTCBB firms, the magnitudes of the mean spreads are quite large. We also examine median spreads and find smaller magnitudes (e.g. 0.415 in 1999 for Noncompliant firms vs. a mean of 0.597). All of the results in Table 6 are also statistically significant using medians (not reported).

<sup>33</sup> Although this result does not hold for share turnover, the log of monthly share volume exhibits the pattern as the other two liquidity proxies. Thus, the turnover pattern could be related to the difficulty of obtaining reliable shares outstanding estimates for these firms. See footnote 17.

Finally, the coefficient on the incremental level of liquidity in 2000/1 for Already Compliant firms ( $DALR * DPOST$ ) is significantly negative for the bid-ask spread, significantly positive for share turnover, but insignificant in the days traded regression. The results indicate that the positive externalities evidenced by the return findings stem in part from liquidity improvements. NASDAQ Small Cap firms in contrast exhibit significantly higher spreads and lower turnover in 2000/1 compared to 1998/9. Thus, the findings for liquidity improvements found for Already Compliant firms do not reflect time trends or economy-wide movements in liquidity. Note, however, the higher level of trading activity is achieved through the same percentage of days traded, which is also constant for NASDAQ Small Cap firms over the same time period.

### 6.3 Results for changes in liquidity around the phase-in month

Next, we examine changes in liquidity measures in the months surrounding the firm-specific phase-in date. This analysis allows us to tie the permanent shifts in liquidity documented above to the eligibility rule. It also permits us to examine any other abnormal trading activity in firms around the phase-in dates.

Figure 1b provides a timeline for these tests. We define a month as 21 trading days. The month ending with the phase-in date for each firm is defined as event month 0. Unfortunately, we do not have bid-ask spread data to conduct these tests. For the other proxies, we compute the monthly value of the liquidity measure starting in month -4 before to the phase-in date up to month +3 thereafter. We perform this test by modifying the regression in equation (1) to include monthly indicator variables:

$$\begin{aligned}
 \text{Liquidity Measure}_{it} = & \beta_1 DNON_i + \sum_{t=-3}^{+3} \beta_{2,t} DNON_i * DMONTH_t + \beta_3 DNEW_i + \\
 & \sum_{t=-3}^{+3} \beta_{4,t} DNEW_i * DMONTH_t + \beta_5 DALR_i + \sum_{t=-3}^{+3} \beta_{5,t} DALR_i * DMONTH_t + \varepsilon_{it}
 \end{aligned} \tag{2}$$

where  $Liquidity\ Measure_{it}$  = monthly share turnover or the percent of days traded in the month for firm  $i$  in month  $t$ ;  $DNON_i = 1$  if firm  $i$  is a Noncompliant firm and 0 otherwise;  $DNEW_i = 1$  if firm  $i$  is a Newly Compliant firm and 0 otherwise;  $DALR_i = 1$  if firm  $i$  is an Already Compliant firm and 0 otherwise; and  $DMONTH_t = 1$  if the liquidity measure is from month  $t$  and 0 otherwise.

We include values of the liquidity measures from four months prior to the phase-in date as a benchmark for the pre-event level of the liquidity measure. Thus, a significant coefficient on the interaction between the firm indicator and the  $DMONTH_t$  indicator variable suggests a significant change in the liquidity proxy for that group *relative to month -4*. We omit the Small Cap firms because there is no event date for these firms.

Table 7 presents results for this regression. Overall, the levels of the liquidity measures are lower than those reported in Table 6 because, for this regression, we do not restrict the sample to firms for which we have two years of data. Therefore, Table 7 regressions include smaller firms. Noncompliant firms exhibit a significant increase in trading activity for both proxies in the two months prior to the phase-in date. This increased activity likely reflects investors rebalancing their holdings in anticipation of firms' pending noncompliance and removal from the OTCBB, which is consistent with the abnormal return results documented in Table 5. After the removal from the OTCBB, Noncompliant firms experience a significant decline in trading activity, which is consistent with our expectations and previous results.

Newly Compliant firms exhibit a significant increase in trading activity two months prior to the phase-in date, i.e., shortly before the initial compliance test. Liquidity continues to increase for both measures, peaking in the month of or after the phase-in date, and then slowly declines to roughly the incremental levels observed in Table 6. This pattern likely reflects rebalancing due to the uncertainty about firms' compliance and the fact that some firms in this group fail the initial compliance tests.

For Already Compliant firms, there is a significant increase in trading activity two months before the phase-in date that persists through the next five months. As they have already been filing with the SEC, the liquidity improvements are likely to reflect positive externalities stemming from liquidity spillovers and an enhanced reputation of the OTCBB. Comparing Tables 6 and 7 indicates that the increases in turnover and days traded are not sustained at this level in the long-run. Thus, not all changes observed in Table 7 are likely to reflect externalities.

In summary, the findings in this section suggest that the imposition of SEC disclosure requirements leads to significant liquidity increases for Newly Compliant and to a lesser degree for Already Compliant firms. Thus, firms continuing to trade on the OTCBB garner significant and sustained liquidity benefits. For firms that were already filing with the SEC, these benefits are consistent with the existence of positive externalities from imposing SEC disclosure requirements on other non-filing OTCBB firms. The eligibility rule imposes costs on Noncompliant firms by forcing them into the Pink Sheets, where they experience significant and sustained decreases in liquidity after their phase-in date.

#### 6.4 *Sensitivity analyses*

Table 2 indicates that the phase-in schedules and the compliance rates are different for financial and non-financial firms. Moreover, banks and insurance firms have special reporting obligations with their regulatory bodies, even prior to the eligibility rule. We eliminate banks and insurance firms to see whether they affect our results. Restricting the samples to non-financial firms produces very similar results to those reported in Tables 4, 6 and 7.

Furthermore, we are concerned about bankrupt firms in our samples. These firms experience severe financial difficulties and often have been delisted from one of the major exchanges as a result. For these reasons, bankrupt firms may be special case. Therefore, we

exclude firms in bankruptcy proceedings, indicated by a “Q” at the end of their ticker symbol, from our samples. We find that eliminating these firms yields essentially the same results as those reported in Tables 4-7.

Finally, we address the issue that the Already Compliant group contains some firms that voluntarily adopted SEC filing prior to the introduction of the eligibility rule. The concern is that results for the Already Compliant group reflect the change from voluntary to mandatory filing for those firms rather than externalities from the eligibility rule. Note, however, that disclosure requirements, SEC enforcement, and legal liability are essentially the same for voluntary and mandatory filers (see Appendix). Thus, it is not obvious what changes for voluntary firms.

We classify firms as voluntary and mandatory filers in 1998. Firms with 500 or more shareholders are clearly mandatory filers under Section 12(g). Firms with fewer than 300 owners of record are considered voluntary filers because Section 12(g) and 15(d) filing requirements can be suspended in this case. Firms with between 300 and 500 owners can discontinue filing only if it is neither the year of the IPO nor total assets exceeded \$10 million for the last three fiscal year ends. However, as we do not have data on total assets for the last three fiscal years prior to 1998, we classify these firms once as voluntary and once as mandatory, and compare the findings. Irrespective of the classification of this middle group, we find that both voluntary and mandatory filers exhibit similar decreases in the spreads and that their magnitudes are very close to those reported in Table 6, albeit at lower significance levels due to the reduced sample size. For share turnover, mandatory filers exhibit smaller increases than voluntary firms. However, the magnitude of the incremental changes for the mandatory firms is still comparable to those reported in Table 6 (0.26 and 0.12 depending on the assignment of firms with 300 to 499

owners). For the returns, we find similar results for voluntary and mandatory firms around the announcement and phase-in dates. In summary, our evidence for the Already Compliant group does not seem to be driven by voluntary filers alone and continues to be consistent with the existence of positive externalities of disclosure regulation.

## **7. Conclusions**

This paper examines the economic consequences of SEC disclosure regulation. We exploit a recent regulatory change mandating firms on the OTC Bulletin Board to comply with the reporting requirements under the Securities Exchange Act of 1934. Prior to 1999, firms could be quoted on the OTCBB without filing with the SEC. The eligibility rule eliminated this possibility and forced over 3,500 firms that were not previously filing with the SEC to either make the required disclosures or move to the Pink Sheets. Firms already filing with the SEC were not affected by the rule. We use this regulatory event, and the three groups created by it, to document firm-specific costs and benefits, as well as externalities, of disclosure regulation.

The eligibility rule had rather dramatic consequences for the composition of the OTCBB. Almost 75% of the firms not previously filing with the SEC were removed from the market during the rule's phase-in period and forced into the Pink Sheets, where they are *not* subject to SEC disclosure requirements and associated enforcement. Thus, for the majority of OTCBB firms, the costs of SEC disclosure regulation outweigh the benefits. Consistent with this interpretation, we find that Noncompliant firms are smaller, less leveraged, and more profitable. These results suggest that an important consequence of mandatory SEC disclosures is to push smaller firms with lower outside financing needs into a less regulated market, rather than to compel them to more disclosure. This evidence is consistent with "crowding out" effects documented in prior work (Stigler, 1964; Jarrell, 1981) and shows that it is important to consider

firms' responses to the imposition of disclosure regulation. In this regard, the Pink Sheets may have played an important role. The existence of this market likely prevented more firms from going private, but it may also have limited the number of firms that were compelled to adopt SEC disclosures.

In terms of market responses, we examine returns around the key announcement and phase-in dates of the eligibility rule. The returns for the three groups are consistent with their prior disclosure strategies and their responses to the eligibility rule, indicating significant costs from the imposition of SEC disclosures for Noncompliant and Newly Compliant firms. But we also find positive announcement returns for the Already Compliant firms, consistent with the existence of positive externalities.

We also examine liquidity changes around the introduction of the eligibility rule to delve deeper into the sources of our return results. The findings across all measures suggest that the imposition of SEC disclosures improves liquidity for firms that did not previously file with the SEC and adopt SEC disclosures. Firms not complying with the eligibility rule experience permanent decreases in liquidity due their relegation to the less automated Pink Sheets. We also find increases in liquidity for the Already Compliant firms, suggesting liquidity spillovers and enhanced market reputation as sources of the positive externalities.

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## Appendix

### Market Characteristics, Disclosure Requirements, and Enforcement Rules

Market	Firms	Market Characteristics				Disclosure Requirements				Enforcement Rules		
		Listing Requirements <sup>1</sup>	Listing Fees <sup>1</sup>	Binding Quotes Only <sup>2</sup>	Real-time electronic quotes	Section 13 and 15(d) filings: Audited 10-K, 10-Q, 8-K	Rule 15c2-11: "Current" financials with the market maker at the time of filing only	No audit requirement	Section 14 and 16: Proxy and insider trading reporting	Section 18: Civil liability	Section 15 (c)(4): SEC compliance orders	Section 12k: 10-day trading halts
NASDAQ Small Cap	All firms	Y	Y	Y	Y	Y	Exempt	Y	Y	Y	Y	
OTCBB Before 1/4/99	SEC filers <sup>3</sup>	N	N	Y	Y	Y	Exempt	Y <sup>3</sup>	Y	Y	Y	
OTCBB Before 1/4/99	Non-SEC-filers	N	N	Y	Y	N	Y	N	N	N	Y	
OTCBB After 1/4/99	All firms	N	N	Y	Y	Y	Exempt	N <sup>6</sup>	Y	Y	Y	
Pink Sheets	Non SEC filers <sup>4</sup>	N	N	N	N <sup>5</sup>	N	Y	N	N	N	Y	

<sup>1</sup> To continue trading on the NASDAQ Small Cap market, a firm must have a minimum bid price of \$1.00, at least two market makers, at least 300 shareholders, and meet one of the following criteria: \$2.5 million in shareholders' equity, \$35 million in market cap, or \$500,000 in net income from continuing operations. Listing fees for the NASDAQ Small Cap market include a \$10,000 - \$50,000 entry fee (based on shares outstanding) and at least \$8,000 in annual fees.

<sup>2</sup> The Pink Sheets have no rules for quotes (they can be two-sided, one-side, or indicative only). On the OTCBB, market makers pay \$6 per security per month, whereas on the Pink Sheets, market makers face a tiered fee schedule based on the total number of securities quoted. For this reason, it is generally cheaper for market makers to quote large numbers of low-volume stocks on the Pink Sheets than on the OTCBB. In addition, market making on the OTCBB requires a NASDAQ terminal.

<sup>3</sup> SEC filers on the OTCBB before 1/4/99 would include Section 12(g) firms, Section 15(d) firms, and voluntary filers. Section 12(g) firms are issuers with more than \$10 million in total assets *and* at least 500 registered owners at the fiscal year end. Section 15(d) firms are issuers that registered securities under the 1933 Act (e.g., offered more than \$1 million in equity). Both Section 12(g) and Section 15(d) firms have to comply with the reporting obligations under the 1934 Act regardless of where they are quoted. Section 15(d) filers, however, are exempted from the proxy and insider trading provisions.

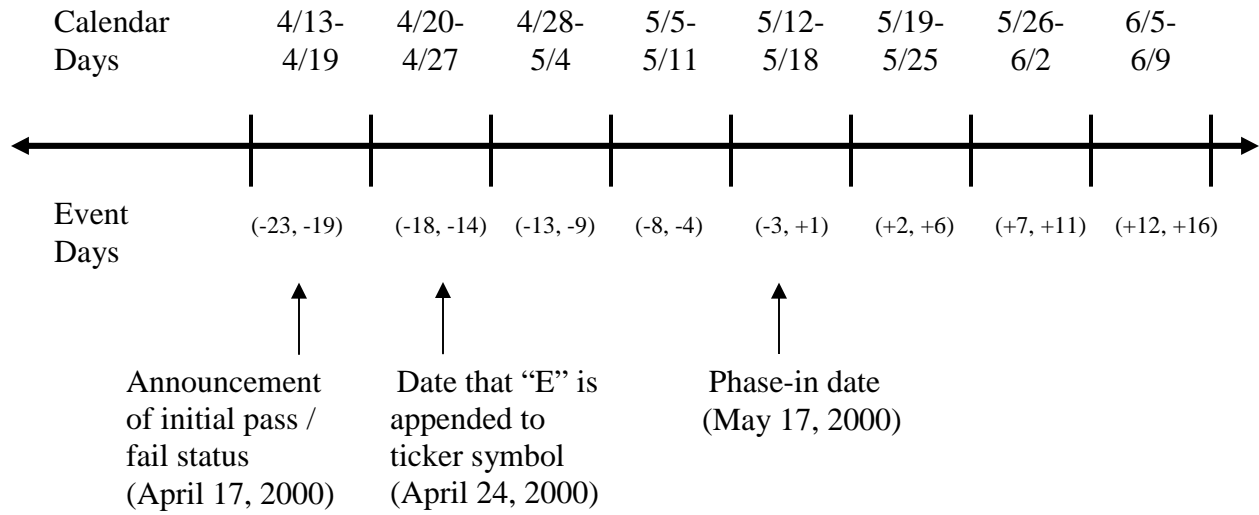
<sup>4</sup> Mandatory and voluntary SEC filers on the Pink Sheets face the same disclosure requirements and enforcement rules as SEC filers on the OTCBB (see row 2).

<sup>5</sup> In June 2000, the Pink Sheets began to provide real-time electronic quotes for its market.

<sup>6</sup> Firms above the Section 12(g) limits continue to be subject to the proxy and insider trading provisions as indicated in the second row.

Figure 1  
Time-line for event study tests

**Figure 1a: Event weeks around the phase-in period for a 5/17/2000 phase-in date**



**Figure 1b: Event months around the phase-in period for a 5/17/2000 phase-in date**

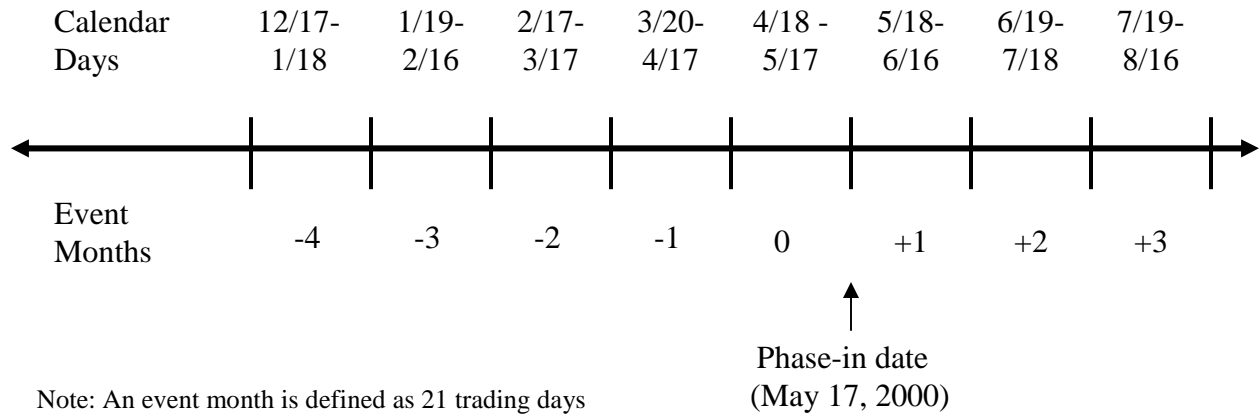


Table 1  
Listing Statistics for OTC Bulletin Board firms

Listing status of OTC Bulletin Board firms as of 6/30/01 and reasons for delisting

	Firms quoted at 1/4/99	New additions after 1/4/99	Total
Firms with primary domestic issues on OTCBB	6096	1581	7677
- Inactive firms	-483	0	-483
Firms subject to eligibility rule	5613	1581	7194
Firms trading on OTCBB as of 6/30/01	1920	1136	3056
Delisted due to Rule 15c (no active market maker)	99	59	158
Delisted due to eligibility rule during phase-in	3190	0	3190
Delisted due to eligibility rule after phase-in	399	286	685
- Relisted after failure to comply with above rules	-361	-42	-403
Listed on NASDAQ	127	47	174
Listed on AMEX/NYSE	63	28	91
Mergers and Acquisitions	131	37	168
Bankruptcies and Liquidations	34	33	67
Gone Private	10	0	10
Suspended by SEC	13	3	16
- Relisted after delisted for above reasons	-12	-6	-18
Firms subject to eligibility rule	5613	1581	7194

The table provides statistics for the numbers of issuers quoted on the OTC Bulletin Board between 1/4/1999 and 6/30/2001. The statistics have been compiled from the archived daily lists of additions, deletions, and changes found at [www.otcbb.com](http://www.otcbb.com).

Table 2  
Compliance statistics for OTC Bulletin Board firms

Panel A: Phase-in statistics for firms subject to eligibility rule quoted as of 1/4/1999

Type of firm (phase-in dates)	Total Number of Issuers Reviewed	Initial Fail	Initial Pass	Became Compliant in Review Period	Total Issuers Passed	Total Issuers Failed
Nonfinancial firms (July 1999 – May 2000)	4977	3436 69.0%	1541 31.0%	499 10.0%	2040 41.0%	2937 59.0%
Financial firms (June 2000)	636	363 57.1%	273 42.9%	110 17.3%	383 60.2%	253 39.8%
Total	5613	3799 67.7%	1814 32.3%	609 10.8%	2423 43.2%	3190 56.8%

Panel B: Subsamples of firms based on compliance

	Total	Non-SEC-filers in 1998 (n = 3,628)		SEC filers in 1998 (n = 1,985)	
		Newly Compliant	Non- compliant	Already Compliant	Delinquent / Terminated
Initial pass firms	1814	435		1379	
Firms that became compliant in review period	609	404			205
Total issuers failed	3190				
Complied within two months after failing		107			16
Never complied or complied after two months			2682		385
Total	5613	946	2682	1379	606

Panel A of the table provides phase-in statistics for issuers quoted on the OTC Bulletin Board and subject to the eligibility rule as of 1/4/1999. The statistics were compiled from the archived daily lists of additions, deletions, and changes found at [www.otcbb.com](http://www.otcbb.com). Nonfinancial Issuers were assigned a phase-in date between July 1999 and May 2000 based on the firm's ticker symbol as of 1/4/1999. The phase-in date is the date by which the issuer has to be compliant with the eligibility rule, i.e., has to be current in its filings with the SEC. Issuers were reviewed 30 days prior to this date. Banks and insurance companies were assigned phase-in dates in June 2000 and evaluated 60 days prior to this date. Column 3 (4) reports the number of firms that passed (failed) the initial compliance test. Firms that initially failed, but complied within the 30- (or 60-) day review period are reported in column 5. Firms that failed to comply with the eligibility rule as of the phase-in date (column 7) were removed from the OTCBB, effective one day after the phase-in date. Panel B of the table provides details on the composition of key subsamples of firms examined in the primary tests. SEC filers include all firms that filed either a periodic report (any Form 10-K, 10-Q) or a registration statement requiring financial statements during 1998. Filing data was obtained from the SEC's ftp site. "Newly Compliant" firms consist of non-filers in 1998 that (1) adopted SEC filing prior to the phase-in period, (2) failed the initial compliance test but became compliant prior to the phase-in date, and (3) failed to comply with the eligibility rule prior to the phase-in date but did adopt SEC filing within the next two months and were reinstated to the OTCBB. "Noncompliant" firms include all non-filers in 1998 that did not comply with SEC filing requirements in response to the eligibility rule and hence were dropped to the Pink Sheets. "Already Compliant" firms are issuers that were already filing with the SEC in 1998 and passed the initial compliance test. "Delinquent" ("Terminated") filers include firms filing with the SEC in 1998 that were not current in their filings at the initial compliance test, but became compliant (remained noncompliant) after the test. These firms are dropped from the analyses.

Table 3  
Listing Choices and Firm Characteristics

Panel A: Descriptive Statistics for SEC-Filers vs. Non-SEC-filers and Newly Compliant vs. Noncompliant firms

Variable	SEC Filers			Non-SEC-filers			Newly Compliant (OTCBB)			Noncompliant (Pink Sheets)		
	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median
Share price	1642	6.840	0.750	2617	8.947***	0.750***	687	12.496	4.000	1930	7.683***	0.391***
Market value (000s)	1314	34135.8	8259.3	1096	35122.2	6776.4***	438	62437.9	24992.0	658	16939.5***	1210.0***
Total assets (000s)	1862	51980.7	4588.0	794	40175.5**	1126.2***	423	49561.6	1122.0	371	29473.8**	1141.1
Number of shareholders	1758	942.3	500.0	217	703.9***	388.0***	137	720.2	378.0	80	676.1	389.5
Capital intensity	1803	0.224	0.121	753	0.221	0.103***	397	0.201	0.078	356	0.244**	0.144***
Financial leverage	1444	0.265	0.066	558	0.222	0.005***	280	0.251	0.007	278	0.192	0.003
Return on assets	1827	-1.158	-0.158	770	-1.955***	-0.284***	414	-2.200	-0.343	356	-1.671	-0.255**
Positive net income indicator	1890	0.318	0.000	913	0.276**	0.000**	493	0.268	0.000	420	0.286	0.000
Bank & insurance indicator	1985	0.073	0.000	3628	0.135***	0.000***	946	0.267	0.000	2682	0.089***	0.000***

Panel B: Determinants of Firms' Compliance Choices (Newly Compliant versus Noncompliant firms)

	Newly Compliant=1		Newly Compliant=1		Newly Compliant=1		Newly Compliant=1	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Constant	-1.434	<0.001	-3.763	<0.001	-1.037	<0.001	-1.991	<0.001
Months to phase-in date	0.058	<0.001	0.060	<0.001	0.080	<0.001	0.066	0.019
Bank & insurance indicator	0.412	<0.001	0.568	0.001	0.526	0.159	0.581	0.239
Log Size (Share price)	0.136	<0.001	-	-	0.080	0.009	-	-
Log Size (Market value)			0.310	<0.001	-	-	0.141	<0.001
Financial leverage					0.113	0.157	0.173	0.127
Profitability					-0.336	0.026	-0.264	0.153
McFadden R <sup>2</sup>		0.120		0.225		0.049		0.063
N		2617		1096		472		312

\*\*\*, \*\*, \* Significantly different from other group at the 0.01, 0.05 and 0.10 level, respectively, using a two-tailed t-test and Wilcoxon test

The table presents firm characteristics for SEC filers, non-SEC-filers, Newly Compliant and Noncompliant firms. Panel A reports univariate tests for differences in the means and medians. Panel B reports probit models for firms' compliance choices. P-values are based on robust (Huber-White) standard errors. Share price and market value of equity are as of 6/30/1999. To correct for errors in the number of shares outstanding early in the data series, we use the shares outstanding as of the last day with Datastream data and multiply this figure by the split-adjusted price from Datastream or the Pink Sheets. Financial and ownership data are obtained from Global Access' SEC database, Mergent's FIS database, Knobias and SEC filings on EDGAR. We combine the datasets to increase data availability. All financial and ownership data is measured as of the fiscal year end between July 1, 1998 and June 30, 1999. For a small number of firms, we use financial data (3%) and number of shareholders (10%) from the previous fiscal year end because the desired year is missing. Capital intensity is measured as the ratio of plant, property and equipment to total assets. Financial leverage is measured as the ratio of long-term debt to total assets. The return of assets is computed as net income over total assets. The indicator for positive net income equals one if net income is greater than zero and equals zero otherwise. The indicator for banks and insurance companies is obtained from the OTCBB's webpage. We delete prices below \$0.01 and market values below \$100,000 as they are probably erroneous. We also delete 1% extreme observations on either side of the distribution, except when the variable is naturally bounded.

Table 4  
Mean Raw Returns around Eligibility Rule Announcement Dates

Event	Event Date	Returns by exchange			Returns by 1998 SEC filing status				Returns by compliance subsamples					
		NASDAQ Small Cap	OTCBB	SC v BB	SEC Filers in 1998	Non-filers in 1998	SEC v SC	SEC v Non	Already Compliant	Newly Compliant	Non- Compliant	Alr v New	New v Non	
WSJ article hinting at changes	9/4/1997	0.018 <sup>***</sup>	0.005 <sup>**</sup>	†	0.011 <sup>***</sup>	0.000		††	0.013 <sup>***</sup>	-0.002	0.001		††	
NASD announces it may require filing	12/9/1997	-0.021 <sup>***</sup>	-0.028 <sup>***</sup>		-0.033 <sup>***</sup>	-0.024 <sup>***</sup>		††	††	-0.033 <sup>***</sup>	-0.020 <sup>***</sup>	-0.026 <sup>***</sup>	††	
NASD proposes rule change	2/13/1998	0.004	0.008 <sup>***</sup>		0.013 <sup>***</sup>	0.002		†	††	0.021 <sup>***</sup>	0.010	-0.001	†	†
NASD approves rule change	5/7/1998	0.001	0.012 <sup>***</sup>		0.011 <sup>**</sup>	0.013 <sup>†</sup>		†		0.016 <sup>***</sup>	0.020 <sup>**</sup>	0.009 <sup>*</sup>		
SEC approves eligibility rule	1/4/1999	0.055 <sup>***</sup>	0.061 <sup>***</sup>		0.084 <sup>***</sup>	0.041 <sup>***</sup>		†††	†††	0.076 <sup>***</sup>	0.043 <sup>***</sup>	0.040 <sup>***</sup>	†††	
Mean Cumulative Return (all events)		0.056 <sup>***</sup>	0.056 <sup>***</sup>		0.083 <sup>***a</sup>	0.032 <sup>***</sup>		††	†††	0.091 <sup>***a</sup>	0.048 <sup>***</sup>	0.025 <sup>**b</sup>	††	

\*\*\*, \*\*, \* Significantly different from zero at the 0.01, 0.05, 0.10 level, respectively, using a two-tailed test

†††, ††, † Significant difference between groups at the 0.01, 0.05, 0.10 level, respectively, using a two-tailed test

<sup>a, b</sup> Significantly different from the mean cumulative returns for the NASDAQ Small Cap at the 0.05, 0.10 level, respectively, using a two-tailed test

The table presents 5-day raw returns for key announcements related to the introduction of the eligibility rule. The 5-day buy-and-hold returns are compounded from day -3 to day +1 around the event date given in column 2 (excluding holidays). The last row reports the cumulative return over the five event dates. Column 3 reports average 5-day return for a sample of firms listed on the NASDAQ Small Cap Exchange (619 firms). Column 4 provides average 5-day returns for all OTC Bulletin Board firms (2391) for which we have price data for all five dates. The “SC v BB” column indicates whether these returns are significantly different from each other. The next two columns report the announcement returns for firms that filed with the SEC during 1998 (1124) and firms that did not file with the SEC during 1998 (1267). See Table 2 for more details on the SEC filing. The “SEC v. SC” (“SEC v. Non”) column indicates whether the returns of the SEC filers in 1998 are significantly different from the NASDAQ Small Cap firms (Non-SEC-filers in 1998). The next three columns report announcement returns for Already Compliant firms (817), which are issuers that were already filing with the SEC in 1998 and which passed the initial compliance test; Newly Compliant firms (406), which include all non-SEC-filers in 1998 that adopt SEC filing because of the eligibility rule; and Noncompliant firms (861), which include all non-SEC-filers in 1998 that did not comply with SEC filing requirements and hence were dropped to the Pink Sheets. The “Alr v. New” (“New v. Non”) column indicates whether the returns for Newly Compliant group are significantly different from the returns for the Already Compliant (Noncompliant) group.

Table 5  
Mean Monthly and Weekly Market-Adjusted Returns around Phase-in Dates

Trading Days relative to phase-in	Already Compliant	Newly Compliant	Non- Compliant	Newly Compliant Firms		
				Pass	Fail-Pass	Fail-Fail
(-86, -66)	0.018	0.018	-0.011	-0.011	0.039	0.020
(-65, -45)	-0.018	0.021	-0.012	0.021	0.032	-0.010
(-44, -24)	0.008	0.017	-0.040***	-0.039	0.032	0.091
Announcement (-23, -19)	0.005	0.010	-0.007	0.009	-0.002	0.047**
Effective "E" (-18, -14)	0.011**	0.005	-0.006	0.013	0.000	-0.004
(-13, -9)	0.013**	-0.020**	-0.031***	-0.001	-0.038***	-0.013
(-8, -4)	0.003	-0.020***	-0.051***	0.011	-0.033***	-0.058***
Phase-in date (-3, +1)	-0.004	0.008	-0.021***	-0.002	0.013	0.017
(+2, +6)	0.013**	0.001	-0.023***	0.005	0.009	-0.034
(+7, +11)	0.009	0.026***	-0.021***	-0.007	0.060***	0.005
(+12, +16)	0.001	0.026***	-0.003	0.006	0.041***	0.028
(+17, +37)	-0.007	-0.010	-0.086***	-0.045	-0.018	0.081
(+38, +58)	-0.018	0.007	-0.033**	-0.111***	0.040	0.142**
(+59, +79)	-0.022	-0.065***	-0.014	-0.060*	-0.069**	-0.065

\*\*\*, \*\*, \* Significantly different from zero at the 0.01, 0.05, 0.10 level, respectively, using a two-tailed test

This table presents the mean market-adjusted returns for months and weeks before, during, and after the phase-in of the eligibility rule. Day 0 is the phase-in date for each firm. See figure 1 for a timeline. Market-adjusted returns are buy-and-hold firm returns minus buy-and-hold returns on an equally-weighted market index of all firms in the OTCBB. The Announcement week is when the OTCBB posts whether the firms have passed the initial compliance test and the Effective "E" week is when the firms that have not yet complied begin to trade with an "E" appended to their ticker symbols. The sample is comprised of Already Compliant firms (1251 firms), which are issuers that were already filing with the SEC in 1998 and which passed the initial compliance test; Newly Compliant firms (625), which include all non-SEC-filers in 1998 that adopt SEC filing because of the eligibility rule; and Noncompliant firms (2129), which include all non-SEC-filers in 1998 that did not comply with SEC filing requirements and hence were dropped to the Pink Sheets. The Newly Compliant group is further broken down into Pass firms, which adopted SEC filing prior to the phase-in period (240), Fail-Pass firms, which failed the initial compliance test but became compliant prior to the phase-in date (285), and Fail-Fail firms, which failed to comply with the eligibility rule prior to the phase-in date, but adopted SEC filing within the next two months and were reinstated to the OTCBB (100). Because they had a 60-day period between the Effective "E" date and the Phase-in date, rather than a 30-day period, Banks and Insurance Companies are dropped from this analysis.

Table 6  
Long-term Shifts in Liquidity Measures

$$Avg.LiquidityMeasure_{it} = \beta_1 DNON_i + \beta_2 DNON_i * DPOST_t + \beta_3 DNEW_i + \beta_4 DNEW_i * DPOST_t + \beta_5 DALR_i + \beta_6 DALR_i * DPOST_t + \beta_7 DNQSC_i + \beta_8 DNQSC_i * DPOST_t + \varepsilon_{it}$$

Panel A: Regression coefficients:

Firms and time periods	Average Liquidity Measure		
	Bid-ask Spread	Monthly Turnover (%)	Percent of Days Traded
Noncompliant in 1998/9	0.597***	1.328***	0.342***
Incremental level in 2000/1	0.121***	-0.545***	-0.076***
Newly Compliant in 1998/9	0.408***	1.968***	0.427***
Incremental level in 2000/1	-0.189***	0.698***	0.067***
Already Compliant in 1998/9	0.315***	2.059***	0.509***
Incremental level in 2000/1	-0.064***	0.297**	-0.001
NASDAQ Small Cap in 1998/9	0.085***	4.780***	0.743***
Incremental level in 2000/1	0.094***	-0.834***	-0.009

Panel B: F-tests for differences in coefficients

Difference in Incremental Levels:	Bid-ask Spread	Monthly Turnover (%)	Percent of Days Traded
Noncompliant – Newly Compliant	0.310***	-1.243***	-0.143***
Noncompliant – Already Compliant	0.185***	-0.842***	-0.075***
Newly Compliant– Already Compliant	-0.125***	0.401*	0.068***
Noncompliant – NASDAQ Small Cap	0.027*	0.289**	-0.067***
Newly Compliant – NASDAQ Small Cap	-0.283***	1.532***	0.076***
Already Compliant – NASDAQ Small Cap	-0.158***	1.131***	0.008
Difference in 1998/9 Levels:			
Noncompliant – Newly Compliant	0.189***	-0.640***	-0.085***
Noncompliant – Already Compliant	0.282***	-0.731***	-0.167***
Newly Compliant– Already Compliant	0.093***	-0.091	-0.082***
Difference in 2000/1 Levels:			
Noncompliant – Newly Compliant	0.499***	-1.883***	-0.228***
Noncompliant – Already Compliant	0.467***	-1.573***	-0.242***
Newly Compliant– Already Compliant	-0.032	0.310**	-0.014

\*\*\*, \*\*, \* Significantly different from zero at the 0.01, 0.05, 0.10 level, respectively, using a two-tailed test

The table presents results from a regression of average liquidity measures on indicators for firm type interacted with the period of the average liquidity measure. The Bid-ask Spread is computed as the difference between the closing bid and ask prices, divided by the midpoint of the spread. Monthly Turnover (%) is computed as monthly share volume divided by average monthly shares outstanding, times 100. Percent of Days Traded is the percentage of trading days in a month with nonzero volume. Noncompliant firms (1093-1587 firms) include all non-SEC-filers in 1998 that did not comply with SEC filing requirements and hence were dropped to the Pink Sheets (sample sizes differ for each dependent variable). Newly Compliant firms (614-630) are non-SEC-filers in 1998 that adopt SEC filing because of the eligibility rule. Already Compliant firms (1186-1051) are firms that were already filing with the SEC in 1998 and passed the initial compliance test. NASDAQ Small Cap firms (406-555) are a sample of firms from that exchange. The spreads (turnover and days traded) are averaged over the three-month (six-month) period Oct.-Dec. 1998 (Dec. 1998-May 1999), before the eligibility rule phase-in, and Oct.-Dec. 2000 (Dec. 2000-May 2001), after the completion of the phase-in. Firms must have observations in both periods to be included in the sample. The Incremental Level in 2000/1 indicates the difference in the average liquidity measure between 1998/9 and 2000/1. Panel A presents regression coefficients and Panel B presents F-tests comparing coefficients.

Table 7  
Monthly Changes in Liquidity Measures around Phase-in Date

$$LiquidityMeasure_{it} = \beta_1 DNON_i + \sum_{t=-3}^{+3} \beta_{2,t} DNON_i * DMONTH_t + \beta_3 DNEW_i + \sum_{t=-3}^{+3} \beta_{4,t} DNEW_i * DMONTH_t + \beta_5 DALR_i + \sum_{t=-3}^{+3} \beta_{5,t} DALR_i * DMONTH_t + \varepsilon_{it}$$

Firms and time periods	Average Liquidity Measure	
	Monthly Turnover (%)	Percent of Days Traded
Noncompliant in month -4	1.041 <sup>***</sup>	0.291 <sup>***</sup>
Incremental level in -3	0.041	0.007
Incremental level in -2	0.187	0.023 <sup>**</sup>
Incremental level in -1	0.302 <sup>***</sup>	0.040 <sup>***</sup>
Incremental level in 0	0.371 <sup>***</sup>	0.048 <sup>***</sup>
Incremental level in +1	-0.068	-0.013
Incremental level in +2	-0.322 <sup>**</sup>	-0.061 <sup>***</sup>
Incremental level in +3	-0.361 <sup>***</sup>	-0.070 <sup>***</sup>
Newly Compliant in -4	1.990 <sup>***</sup>	0.443 <sup>***</sup>
Incremental level in -3	0.254	0.013
Incremental level in -2	0.591 <sup>***</sup>	0.029
Incremental level in -1	0.790 <sup>***</sup>	0.043 <sup>**</sup>
Incremental level in 0	1.103 <sup>***</sup>	0.053 <sup>***</sup>
Incremental level in +1	0.812 <sup>***</sup>	0.055 <sup>***</sup>
Incremental level in +2	0.658 <sup>***</sup>	0.054 <sup>***</sup>
Incremental level in +3	0.472 <sup>**</sup>	0.047 <sup>**</sup>
Already Compliant in -4	2.023 <sup>***</sup>	0.500 <sup>***</sup>
Incremental level in -3	0.208	0.010
Incremental level in -2	0.485 <sup>***</sup>	0.027 <sup>*</sup>
Incremental level in -1	0.945 <sup>***</sup>	0.049 <sup>***</sup>
Incremental level in 0	1.039 <sup>***</sup>	0.062 <sup>***</sup>
Incremental level in +1	1.192 <sup>***</sup>	0.066 <sup>***</sup>
Incremental level in +2	1.006 <sup>***</sup>	0.073 <sup>***</sup>
Incremental level in +3	1.071 <sup>***</sup>	0.077 <sup>***</sup>

\*\*\*, \*\*, \* Significantly different from zero at the 0.01, 0.05, and 0.10 level, respectively, using a two-tailed test

The table presents results from a regression of monthly liquidity measures on indicators for firm type interacted with the month of the liquidity measure. Monthly Turnover (%) is computed as monthly share volume divided by average monthly shares outstanding, times 100. Percent of Days Traded is the percentage of trading days in a month with nonzero volume. Noncompliant firms (2404 firms) include all non-SEC-filers in 1998 that did not comply with SEC filing requirements and hence were dropped to the Pink Sheets. Newly Compliant firms (894) are non-SEC-filers in 1998 that adopt SEC filing because of the eligibility rule. Already Compliant firms (1387) are firms that were already filing with the SEC in 1998 and passed the initial compliance test. The time periods range from four months before the phase-in month (the benchmark period) to three months after the phase-in month (see figure 1 for timeline). The Incremental Level in -t indicates the difference in the liquidity measure between month -4 and month -t. The columns provide the coefficients of the regression, which indicate the magnitudes of the level or incremental level of the liquidity measures.