

MANDATED DISCLOSURE, STOCK RETURNS, AND THE 1964 SECURITIES ACTS AMENDMENTS*

MICHAEL GREENSTONE
PAUL OYER
ANNETTE VISSING-JORGENSEN

The 1964 Securities Acts Amendments extended the mandatory disclosure requirements that had applied to listed firms since 1934 to large firms traded Over-the-Counter (OTC). We find several pieces of evidence indicating that investors valued these disclosure requirements, two of which are particularly striking. First, a firm-level event study reveals that the OTC firms most affected by the 1964 Amendments had abnormal excess returns of about 3.5 percent in the weeks immediately surrounding the announcement that they had begun to comply with the new requirements. Second, we estimate that the most affected OTC firms had abnormal excess returns ranging between 11.5 and 22.1 percent in the period between when the legislation was initially proposed and when it went into force. These returns are adjusted for the standard four factors and are relative to NYSE/AMEX firms, matched on size and book-to-market equity, that were unaffected by the legislation. While we cannot determine how much of shareholders' gains were a transfer from insiders of these same companies, our results suggest that mandatory disclosure causes managers to focus more narrowly on maximizing shareholder value.

I. INTRODUCTION

Since the passage of the Securities Act of 1933 and the Securities Exchange Act of 1934, the federal government has actively regulated U. S. equity markets. The centerpiece of these efforts is the mandated disclosure of financial information. Proponents of securities market regulations cite cross-country studies that find that higher levels of investor protection, such as mandatory disclosure requirements, are associated with less concentrated ownership, larger equity markets, and higher valua-

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tions of equities [La Porta, Lopez-de-Silanes, and Shleifer 1999; La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1997, 2002]. Although cross-country studies are likely to confound numerous effects, these empirical findings suggest that mandatory disclosure laws may provide access to equity on more favorable terms for entrepreneurs. Furthermore, given the link between financial development and growth [Rajan and Zingales 1998; Castro, Clementi, and MacDonald 2004], these laws may lead to higher standards of living.

Previous research that is narrowly focused on mandatory disclosure laws, however, provides mixed evidence on their impacts. Theoretical models suggest that these laws can be beneficial when the costs of writing or enforcing contracts that bind managers to maximize shareholder value are sufficiently high. Although the first empirical evaluations of mandatory disclosure laws were published four decades ago [Stigler 1964; Friend and Herman 1964; Robbins and Werner 1964; Benston 1973], the subsequent literature has failed to reach a consensus [Coffee 1984; Healy and Palepu 2001]. The absence of convincing evidence has led some legal scholars to recommend significant modification or repeal of the statutes that regulate U. S. securities markets, including the mandatory disclosure requirements [Mahoney 1997; Romano 1998; Palmiter 1999].

This paper presents new evidence on the impacts of mandatory disclosure laws by analyzing the effect of the 1964 Securities Acts Amendments on stock returns and operating performance of firms newly affected by this legislation. With the exception of the Sarbanes-Oxley Act of 2002, the 1964 Amendments are the last major mandatory disclosure regulations applied to U. S. equity markets. They extended the disclosure requirements that have applied to firms traded on exchanges (e.g., the New York and American Stock Exchanges, henceforth NYSE and AMEX) since 1934 to firms traded Over-the-Counter (OTC) that exceeded asset and shareholder floors. Specifically, covered OTC firms were required to (1) register with the SEC; (2) provide regular updates on their financial position, such as audited balance sheets and income statements; (3) issue detailed proxy statements to shareholders; and (4) report on insider holdings and trades.

The 1964 Amendments provide a compelling setting for evaluating the consequences of mandatory disclosure regulations for at least two reasons. First, this legislation did not affect all firms equally. One category of OTC firms was entirely free of all man-

datory disclosure requirements before 1964 but were required to comply with all four types of disclosure after the law. The 1964 legislation required a second set of OTC firms, which was already fulfilling (1) and (2), to begin complying with (3) and (4). Small OTC firms below the asset or shareholder floors were only affected by the 1964 Amendments if they grew above the size cutoffs. In contrast, NYSE and AMEX firms were entirely unaffected by the law, because they had been subject to all four of the mandatory disclosure requirements since the 1934 legislation.

We compare the stock returns and changes in operating performance of affected OTC firms with NYSE/AMEX firms. We also contrast these outcomes among OTC firms that are differentially affected by the 1964 Amendments. This research design provides an opportunity to avoid confounding the effect of the law with unobserved shocks to all firms' stock returns and operating performance. This feature of the analysis is an improvement on much of the previous empirical research on mandatory disclosure laws (e.g., Stigler [1964], Friend and Herman [1964], Robbins and Werner [1964], and Jarrell [1981]).¹

Second, the timing of the debate, passage, and initial enforcement of the Amendments generates potentially informative intertemporal variation in the expected effects of the law. During the period from January 1, 1963, through November 15, 1965, which we label Period 1, the 1964 Amendments were initially proposed and passed into legislation, and it was revealed which individual firms registered with the SEC. If market participants expected the disclosure requirements to produce information that they valued, we expect positive abnormal excess returns for af-

1. Chow [1983], Simon [1989], and Bushee and Leuz [2005] are important exceptions in that they exploit variation in how mandatory disclosure laws affected different categories of firms. Chow found that the 1933 Act lowered shareholder value, though the generality of his findings is limited by the paper's small sample size. Simon found that investor forecast errors (the dispersion of abnormal returns) were lower following the 1933 Securities Act. Her sample is limited to newly issued securities. Bushee and Leuz examine the imposition of the same set of disclosure requirements as those in the 1964 Amendments, when these were applied to the small companies traded on the OTC Bulletin Board in 1999. They find that a large fraction of firms delist in response to the increased disclosure requirements and the decision to delist is associated with a 6 to 25 percent decline in market capitalization. Companies in their sample that did not file with the SEC prior to 1999 had a mean (median) market capitalization of roughly \$39 million (\$7 million) (2005 \$), while the firms in our sample that were newly required to begin complying with all four forms of mandatory disclosure under the 1964 legislation had a mean (median) market capitalization of approximately \$280 million (\$57 million) (2005 \$).

affected OTC firms (relative to unaffected NYSE/AMEX firms) in this period.

During the period that runs from November 15, 1965, through the end of 1966, labeled Period 2, virtually no new information about the law or which firms would comply with its requirements was revealed. This period is therefore used to assess the validity of our approach. Specifically, failure to reject the null of zero abnormal excess returns for affected OTC groups in this period provides support for the validity of our research design and any findings from Period 1.

One reason that the 1964 Amendments have not been studied widely is that electronic data on OTC firms are unavailable in this period. We created the equivalent of the Center for Research in Security Prices (CRSP) data set for a large sample of OTC firms from 1963 through 1966. We combined OTC stock price listings in printed versions of *Barron's* newspapers and data from eleven other publications to create a data file with information on share prices, dividends, stock splits, mergers, name changes, liquidations, accounting variables, and the SEC filing status of 1196 OTC firms. The resulting file is combined with data on NYSE/AMEX firms from the CRSP and COMPUSTAT data files, supplemented with accounting data collected for NYSE/AMEX firms not covered in COMPUSTAT.

The analysis begins with the most direct test available to us of whether shareholders valued the disclosure requirements. A firm-level event study reveals that complying OTC firms had abnormal excess returns of about 3.5 percent in the weeks immediately surrounding the announcement that they had begun to comply with the new requirements. An appealing feature of this test is that the dates of these announcements varied from firm to firm.

Additional evidence that investors valued the 1964 Amendments comes from comparisons of Period 1 returns across groups of OTC firms. We find that firms that were required to begin complying with all four disclosure requirements outperformed firms that were only required to begin complying with disclosure types (3) and (4). The most affected firms also outperformed OTC firms that were not targeted by the legislation. These differences in returns are generally statistically significant at conventional levels.

To evaluate the total effect of the 1964 Amendments, we consider the full Period 1. In this period, estimates from a series

of specifications indicate that OTC firms that were newly required to begin complying with all four forms of mandatory disclosure had statistically significant positive abnormal excess returns ranging between 11.5 and 22.1 percent, relative to size and book-to-market matched NYSE/AMEX firms. The estimates are derived from regression models that adjust for the market return and the size, book-to-market, and momentum factors [Fama and French 1993; Carhart 1997]. They imply that the 1964 Amendments created \$3.2 to \$6.2 billion (2005 \$'s) of value for shareholders of the OTC firms in our sample. Furthermore, in Period 2 we cannot reject the null hypothesis of zero abnormal excess returns for the OTC firms in any specifications, suggesting that these firms do not generally outperform the NYSE/AMEX firms.

We also test whether affected firms' operating performance improved after the Amendments were in force. We find that the most affected OTC firms had greater income and sales growth from 1962 to 1966 than unaffected NYSE/AMEX firms. This result suggests that the market's expectations of improved performance were justified and helps to explain these firms' higher stock returns.

Factor adjustments are critical for only one of our findings. In Period 1 the most affected OTC firms' stock returns exceed the returns of the unaffected NYSE/AMEX firms in the raw, unadjusted data, but this difference is not statistically different from zero. Factor adjustment does not drive the event study results, the most affected OTC firms' high returns relative to the other OTC firms in Period 1, the Period 2 results, or the operating performance results.

Overall, the results suggest that the benefits of the 1964 Amendments substantially outweighed the cost of complying with this law as measured by stock returns. This implies that the affected firms were not managed to maximize shareholder value prior to 1964. We cannot determine whether this was because managers made negative net present value "empire building" acquisitions, lavished excessive salaries or perks on themselves, engaged in insider trading that reduced the liquidity of the firm's shares, or some other mechanism. Regardless of the exact channel, these findings are consistent with the notion that mandatory disclosure laws can cause managers to more narrowly focus on the maximization of shareholder value. This finding is a necessary condition for a positive welfare effect, but it is not sufficient,

because we cannot rule out the possibility that managers lost an amount equal to that gained by shareholders.²

In the next section we describe prior theoretical views on the value of mandatory disclosure and briefly review a model that helps frame our empirical analysis. In Section III we provide some historical background on disclosure regulation in U. S. equity markets and explain in more detail why the 1964 Amendments provide a compelling environment to study the effects of mandatory disclosure laws. Sections IV and V describe our data and our empirical methodology, respectively. The empirical results are presented in Section VI and interpreted in Section VII. Section VIII concludes.

II. THEORETICAL PERSPECTIVES ON DISCLOSURE REGULATION

Here, we briefly review the broad arguments in favor of and against mandatory disclosure requirements in securities markets.³ We also review the Shleifer and Wolfenzon [2002] model of financial markets when insiders can divert firm resources. This model provides a framework to interpret our empirical analysis.

II.A. Theoretical Background

One traditional view of securities market regulation, often attributed to Stigler [1964] and Coase [1960], is that government intervention is at best ineffective and, at worst, damaging. The basis of this view is that private contracts, combined with the possibility of litigation, between shareholders on the one side and managers, underwriters, auditors, and analysts on the other, is a cost-effective way to achieve efficient disclosure. This private enforcement will be especially successful in settings with repeated interactions where agents with superior information are concerned about their reputations.

These views imply that a firm's failure to provide some information must be due to the high costs of provision, lack of value relevance, or valid concerns that competitors may benefit from its

2. To our knowledge, Ferrell [2004] is the only other empirical analysis of the 1964 Securities Acts Amendments. We discuss this paper and contrast it with ours in the interpretation section.

3. See Verrecchia [2001] for a review of the theoretical financial disclosure literatures in accounting, economics, and finance and Easterbrook and Fischel [1984] for a discussion of legal scholarship's evidence on mandatory disclosure.

release. In this setting, mandatory disclosure regulations are either inconsequential or cause firms to release an inefficiently large amount of information.

An alternative view posits that prohibitively high costs of writing and enforcing complete contracts make mandatory disclosure regulations welfare enhancing. There are at least three reasons that regulations may be preferable to an exclusive reliance on private contracts. First, the costs of filing a lawsuit may introduce a free-rider problem among shareholders. In contrast, a regulator does not face these coordination problems. Second, regulations that mandate increased provision of information may be less vulnerable to subversion of justice than litigation (see Glaeser and Shleifer [2003]). Third, regulators' exclusive focus on securities cases may make them more effective than judges or juries at detecting fraud.

II.B. Conceptual Framework

The starting point of the Shleifer and Wolfenzon [2002] model of financial markets is that private contracts cannot set the expected penalties for diversion of firm profits by insiders high enough to deter all diversion. We define diversion as any activity that does not maximize shareholder value, including, but not limited to, expropriation of the cash flow for insiders' personal use, empire building (e.g., negative net present value investments that increase insiders' utility), and insider trading, which reduces liquidity and thus the value of equity.

Shleifer and Wolfenzon [2002] consider an entrepreneur who needs outside funding to bring her ideas to market. In exchange for these investments, she promises the outside shareholders a fraction of the future cash flow. The entrepreneur retains control of the firm, but she cannot credibly commit to zero diversion before paying out dividends.

The price that outside shareholders will pay for a given fraction of shares depends on their expectation of the degree of diversion, which depends on the magnitude of the contracting problem. Outsiders invest contingent upon an expected return at least as great as on alternative investments. In equilibrium, entrepreneurs divert firm resources, and outside shareholders receive the market return on their investment. The key insight is that stock *returns* do not depend on the level of diversion, but stock *prices* do.

In this setting, consider the introduction of a regulatory

policy that increases the expected penalties for diversion, either by increasing the probability of detection or raising the penalty. This policy will reduce the equilibrium level of diversion and, in turn, affect insiders' total payoff and firms' share prices. Consequently, such a policy will have distributional effects and may also impact welfare. These effects will differ for firms organized before and after the policy's introduction.

Consider firms that sold shares to the public before the policy was in force. The introduction of the policy unexpectedly increases the expected penalties for diversion. This lowers the equilibrium amount of diversion by entrepreneurs, which increases expected dividend payments to shareholders. This causes a one-time increase in the value of these firms. However, after this jump in the stock price, the return to holding shares in the firm will again equal the market return.

The increased stock price does *not* necessarily indicate an increase in welfare. Social welfare is unaffected when the abnormal returns are solely due to a transfer of a fixed set of resources from one party (the entrepreneur) to another (outside investors). However, when diversion is costly (e.g., if the total cost of a lavish office exceeds the entrepreneur's private valuation), the reduced diversion will generate welfare improvements.

Our paper tests whether the introduction of the 1964 Securities Acts Amendments led to abnormal stock returns for firms that existed before the legislation was seriously considered. A rejection of the null of zero abnormal stock returns for affected firms would suggest that the information revelation induced by the law was valued by outside shareholders. The basis for this test is the notion that the 1964 Amendments unexpectedly decreased the expected benefit of diversion for insiders by increasing the expected penalties. Although diversion is unobservable, we will also test whether affected firms' operating performance improved after the Amendments were in force.

Finally, in the context of the model, a finding of positive abnormal returns can be interpreted as a necessary but not sufficient condition that the 1964 Amendments increased welfare. Shleifer and Wolfenzon [2002] also consider the case of firms that sell shares to the public after the regulatory policy is in place. They show that the higher expected penalties for diversion affect entrepreneurs' incentives so that in equilibrium there is less diversion and a more efficient allocation of

resources across entrepreneurs. This theoretical finding highlights that the potential welfare gains from mandatory disclosure laws extend beyond any gains associated with the set of firms that were established before such laws were in force. However, an empirical examination of this prediction is beyond the scope of the current paper.

III. BACKGROUND ON FEDERAL DISCLOSURE REGULATIONS AND A NEW RESEARCH DESIGN

Our empirical analysis examines the impact of the 1964 Securities Acts Amendments on the stock returns and operating performance of affected firms. This section provides a brief history of securities laws before the 1964 Amendments and how the structure of the legislation and the timing of its passage and implementation provide a compelling research design to test for the effects of mandatory disclosure laws.⁴

III.A. Federal Regulation of Securities Markets before 1964

Prior to 1933 there was little federal regulation of securities markets. The 1933 Securities Act and the 1934 Securities Exchange Act marked a revolutionary foray into the regulation of securities markets by the federal government. The 1934 Act created four mandatory disclosure requirements that applied to some, but not all, existing firms. Here, we describe these disclosure requirements and detail which categories of firms were required to comply with each of them. Specifically, they are as follows:

1. Firms listed on exchanges (such as the NYSE or AMEX) and OTC firms that had issued securities of sufficient market value after May 1936 were required to register these securities with the SEC. The registration statements had to contain detailed financial information at the time of registration, including balance sheet and profit and loss statements from the previous three years; the terms and position of each class of outstanding securities; the organization, financial structure, and nature of the

4. This section draws heavily from Seligman [1995], as well as *New York Times* and *Wall Street Journal* articles from the 1960s. See these sources for more detailed legislative histories. See Mahoney [1995] for details on the pre-1930s history of disclosure regulation and Mahoney [2003] for a discussion of state “Blue Sky” laws.

business; and the identity and remuneration of directors, officers, and shareholders with more than a 10 percent stake.

2. Firms listed on exchanges (such as the NYSE or AMEX) and OTC firms that had issued securities of sufficient market value after May 1936 were required to file annual reports (Form 10-K) and semiannual reports (Form 9-K) with the SEC. They were also required to report material events as they occurred (Form 8-K).⁵
3. Firms listed on exchanges were required to provide proxy statements in advance of shareholder meetings or votes. These statements must contain information on the qualifications of directors and nominees for directors, executive compensation, and transactions between the company and its officers or directors. All OTC firms were exempted from this requirement.
4. Firms listed on exchanges were required to report the identities of officers, directors, and large shareholders. They also had to report these individuals' holdings of any equity security of the company and provide monthly statements of any changes. Companies could recover any profits that an insider realized from the purchase and sale of the company's stock in any period of less than six months.⁶ All OTC firms were exempted from this requirement.

Thus, the 1933 and 1934 Acts created a system of regulation that imposed different requirements on firms, based on where their shares were traded and whether they had made substantial public offerings after 1936.

To summarize, all listed firms were subject to all four disclosure requirements, OTC firms that had made substantial public offerings since 1936 were subject to requirements (1)

5. The requirement that OTC firms with new offerings register and comply with the periodic reporting requirements was added in a 1936 amendment to the 1934 Act. The 1936 amendment exempted firms for which the total market capitalization for each security class issued was less than \$2 million at the time of the offering. Further, a firm could cease filing periodic reports if and as long as the value of each security class was reduced to less than \$1 million, computed on the basis of the offering price of the last issue of securities of said class offered to the public. These exemptions were replaced in the 1964 Amendments by a different exemption, based on assets and the number of shareholders, described in detail below.

6. Under this law, it was legal to trade on private information if the shares were held for longer than six months. In 1968 a federal court gave the SEC the right to penalize all insider trading.

and (2) above, and OTC firms that had not made a public offering since 1936 were free from all disclosure requirements no matter their size or how widely distributed their securities. Harvard Law Professor Louis Loss [1983] said this system of regulation created, “. . . a double standard of investor protection—a standard that resulted, more by accident than by design, from the piecemeal adoption of the SEC statutes but that nevertheless glowed with an incandescent illogic . . .” [pp. 462–463].

The available evidence suggests that the relatively lax disclosure requirements for OTC firms helped to create an environment where shareholders of these companies were often poorly informed and had few avenues available to penalize management for failing to maximize shareholder value. For example, in a study of a random sample of OTC securities conducted in 1962, the SEC found that more than a quarter of the firms did not provide any reports on the firms’ financial position or results in that year; 73 percent of proxy solicitations involving the election of directors failed to include the names of the nominees; only 16 percent of these solicitations listed the directors’ qualifications; 95 percent of proxy solicitations for election of directors failed to report on management compensation; 24 percent of the firms failed to solicit proxies before shareholder meetings; and in two-thirds of the solicitations involving modifications of securities, the effects of the modification on the rights of existing security holders were not given [United States Securities and Exchange Commission 1963].

Even if OTC firms released independently audited financial statements, the information may not have been considered credible by market participants. In the case of firms not covered by the 1934 Securities Act, state courts had generally ruled that investors could not sue accountants for negligently prepared financial statements unless they had direct dealings with them (see Augenbraun’s [1993] discussion of “privity”). In principle, investors in these companies could sue accountants for fraudulent statements, but, in practice, the legal standard for fraudulence was very difficult to meet. Consequently, these investors had little scope to penalize fraudulence through the courts. In light of these findings, it may not be surprising that Seligman [1995] contends that the “vast majority of securities fraud occurred among firms not subject to the SEC’s period reporting requirements” [pp. 313–314].

Moreover, it was widely believed that many OTC firms chose not to list on exchanges precisely to avoid the stricter disclosure requirements on the NYSE and AMEX.⁷ Although we were unable to determine the precise listing requirements of the NYSE and AMEX in this period, market capitalization has always been an important factor in determining eligibility for listing on these exchanges. In our sample of 1196 OTC firms, there are 1033 firms for which we could determine their market value at the start of 1963. Of these firms 532 (206) had a market capitalization that exceeded the twenty-fifth (fiftieth) percentile market capitalization of firms on the NYSE and AMEX measured at the same time. It is evident that numerous OTC firms that appeared eligible for trading on the more liquid NYSE/AMEX chose to remain on the OTC despite the apparent benefits to their shareholders from a switch.

III.B. Negotiation and Passage of the 1964 Amendments

Between 1934 and 1961 it was not uncommon for SEC staffers, legislators, or other prominent public figures to call for an extension of the mandated reporting requirements to rectify the seemingly arbitrary inequities in regulatory intensity. However, these recommendations never seemed to gain any traction in Congress (see Loss [1983, page 464]). For example, Senator Frear of Delaware introduced a bill to extend mandatory disclosure in 1949, but no action was taken because attention turned to higher priorities such as the Korean War (*Special Study*, part 3, page 7). In 1961 William Cary, the new head of the SEC, called for the extension of the disclosure requirements to OTC firms, but his call failed to produce any real legislative action, like the previous calls for reform.

The political climate about extending mandatory disclosure requirements to OTC securities changed in the wake of the SEC's release of the first part of the *Special Study* in April 1963. This study had been commissioned by Congress, and the SEC's mandate was to examine the functioning of U. S. equity markets generally—not necessarily with a focus on OTC firms. But, based on the findings about the operation of OTC firms (some of which were discussed in the previous subsection), William Cary included a letter in the *Special Study* stating

7. See United States Securities and Exchange Commission [1963] (especially, Part III, p. 16). Hereinafter, we refer to this as the *Special Study*.

that the SEC would make several legislative recommendations, including expanding the disclosure requirements for OTC securities.

The Senate quickly reacted. On July 9, 1963, a subcommittee unanimously approved a bill extending disclosure rules to all OTC firms. On July 30, 1963, the full Senate passed the Securities Act Amendment which held OTC firms with at least \$1 million of assets and 500 shareholders to the same disclosure rules as the 1934 Act imposes on securities traded on the NYSE and AMEX.

The bill languished in the House for more than half a year until the winter of 1964 when President Johnson made two public endorsements of the legislation before the House.⁸ A House subcommittee passed the bill on March 19, 1964, and it was evident that it would soon become law. The full House and Senate passed identical versions of the bill on August 5 and 6, 1964, and Johnson signed it into law on August 20, 1964.

The law required that any OTC firm with at least 750 shareholders and \$1 million of assets as of the last day of its first fiscal year to end after July 1, 1964 (or any year after that), must register with the SEC within 120 days of the end of the fiscal year and begin to comply with the other three types of disclosure.⁹ Based on 1961 asset and shareholder data, the *Special Study* estimated that roughly 32 percent of OTC firms exceeded both the asset and shareholder floors. OTC firms with fewer than 500 shareholders or less than \$1 million in assets were unaffected by the 1964 Amendments.

III.C. The 1964 Amendments as a New Research Design

The structure and timing of the 1964 Securities Act Amendments provides a compelling setting to evaluate the impacts of mandatory disclosure laws on stock returns. This subsection de-

8. The holdup in the House was over the precise asset and shareholder floors and whether the insurance and banking industries should be exempted. The bill's general principle of increased disclosure was never seriously contested. The U. S. Chamber of Commerce and National Association of Manufacturers did attempt to lobby against the bill on the grounds that compliance would be costly and that business should be free of regulatory burdens. However, Edwin Etherington, the president of the American Stock Exchange, estimated the annual compliance costs at approximately \$1500 to \$3000 for most OTC companies that were to be covered by the bill and Congress seemed to find this estimate compelling.

9. The compliance date for firms that met the asset test and had between 500 and 750 shareholders was the last day of its first fiscal year to end after July 1, 1966.

tails how we exploit the structure of the legislation to create multiple groups of OTC firms that were likely to be affected by the legislation to varying degrees and NYSE/AMEX firms that were all unaffected. It also explains how the legislation provides a natural way to divide 1963–1966 into two periods to examine the law’s effects and perform validation exercises of our approach.

First, we discuss how we classify the OTC firms based on their characteristics at the beginning of 1963, which precedes any serious discussion of the 1964 Amendments. The aim is to use *ex ante* information to categorize OTC firms into groups where we expect differential “treatment effects” of the law on stock returns. During the period between the initial legislative discussions and when the 1964 Amendments went into force, the legislation could affect OTC companies’ stock returns through the market’s beliefs about two factors. They are the expected probability that a firm would comply with the disclosure requirements and, *conditional on compliance*, the disclosure requirements’ expected effect on the scope for diversion by insiders.

We exploit variation in these two factors to categorize the OTC firms. In the case of the first factor, we assign each OTC firm to either a “high compliance probability” or “low compliance probability” group. These assignments are based on our impression of the market’s expectation that firms would comply with the 1964 Act’s disclosure requirements. All else equal, we expect that the legislation will have a larger positive effect on stock returns for the “high compliance probability” group, as more of these firms will be subject to new disclosure requirements.

The market’s expected probability, as of the start of 1963, that a firm would comply with the legislation was likely a function of whether the firm was above or below the asset or shareholder floors at that time. We use measures of assets and number of shareholders in 1962 to place firms in the high and low compliance probability groups. Firms are assigned to the “high compliance probability” group if their measured assets in 1962 exceeded \$1 million and they had 500 or more shareholders or their measured assets exceeded \$5 million but shareholder data were unavailable. All other firms are placed in the “low compliance probability” group. It is possible that the market also based its compliance expectations on information about likely growth rates of assets/shareholders or about which firms would attempt to avoid compliance by manipulating their assets or number of

shareholders. To the extent that our high/low compliance probability split does not overlap fully with the perceptions of the market, this will likely bias our results against finding differential returns across groups.

In the case of the second factor, we place each OTC firm into either a “high diversion reduction” or “low diversion reduction” group. These assignments are based on our, and hopefully the market’s, *ex ante* expectations about the reduction in diversion if the firm complies with the four disclosure requirements. These expectations are determined by whether the firm was engaged in periodic reporting under the 1934 legislation by the end of 1962. Firms that were not filing annual reports with the SEC by the end of 1962 faced the possibility of four new types of disclosure. In contrast, firms that were filing with the SEC by 1962 were potentially subject to just two new forms of disclosure.

We assign the 1962 nonfilers to the “high diversion reduction” group and the 1962 filers to the “low diversion reduction” group. The rationale is that we assume that diversion opportunities are reduced more for firms newly complying with all four forms of disclosure than for firms that were only newly subject to the insider trading and proxy requirements. Thus, our expectation is that conditional on compliance the 1964 Amendments will have a larger positive effect on stock returns for the “high diversion reduction” group.

The interaction of these two categorizations divides the OTC firms into four groups. The first OTC group consists of firms that are in the “high compliance probability” and “high diversion reduction” groups. At the beginning of 1963, these firms were above the 1964 Amendments’ size cutoffs and were not filing annual reports with the SEC. Henceforth, they are referred to as the 0–4 group. The number before the dash refers to the number of forms of disclosure that the firm was required to comply with prior to the 1964 Amendments. The number after the dash refers to the number of forms of disclosure that we expect the firm to comply with after the 1964 Amendments were in force. We use this same naming convention to denote the other groups.

The second group consists of firms that by 1963 were above the 1964 Amendments’ size cutoffs and filing annual reports with the SEC. These firms are in the “high compliance probability” and “low diversion reduction” groups. They are labeled 2–4.

The third group is designated 0–0. It is comprised of firms that were 1963 nonfilers and as of 1963 fell below the asset or shareholder floors. These firms are in the “low compliance probability” and “high diversion reduction” groups.

The fourth set of OTC firms is called the 2–2 group. By 1963 these firms were filing periodic reports with the SEC but fell below the 1964 Amendments’ asset or shareholder floors. These firms are in the “low compliance probability” and “low diversion reduction” groups. See the Data Appendix for a more detailed description of the precise rules used to assign firms to the different OTC groups.

If the mandatory disclosure requirements were valued by outside shareholders, then we expect these four OTC groups’ treatment effects to differ. In particular, our prediction is that the 0–4’s treatment effect will be the largest, because these firms have a relatively high probability of compliance and, conditional on compliance, will have a relatively large change in the amount of information they must disclose. By analogous reasoning, we expect the 2–2’s treatment effect to be the smallest. Their expected probability of compliance is relatively low and, among compliers, the change in disclosure requirements is relatively small.

We predict that the 2–4’s and 0–0’s treatment effects are between the 0–4’s and 2–2’s effects. The ordering of the treatment effect for the 2–4’s relative to that of the 0–0’s is ambiguous. Firms in the 2–4 group have a high probability of complying with two new disclosure requirements while firms in the 0–0 group have a low probability of complying with four new requirements.

We also create groups of NYSE/AMEX firms and use them to mitigate the possibility of confounding the effects of the 1964 Amendments with shocks to stock returns common to OTC and NYSE/AMEX firms. These 4–4 groups are constructed so that the distributions of the underlying firms’ market capitalizations and the ratio of book value of equity to market capitalizations are similar to these distributions in the corresponding OTC group. We match these distributions because Fama and French [1992] demonstrate that average stock returns vary systematically with market capitalization and the book-to-market ratio. See the Data Appendix for further details on the construction of the 4–4 groups.

We now explain how we divide 1963–1966 into two periods so

TABLE I
KEY DATES ASSOCIATED WITH THE SECURITIES ACTS AMENDMENTS
OF 1964 AND WITH RESEARCH DESIGN

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1. Beginning of Period 1 (and Period 1a), January 1, 1963: sample of OTC firms' stock returns begins. We assume full impact of 1964 Securities Acts Amendments on stock returns occurs in this period.
 2. April 3, 1963: the SEC releases the first part of the *Special Study*. It recommends imposing exchange disclosure rules on OTC securities.
 3. July 9, 1963: Senate subcommittee unanimously approves bill extending disclosure requirements to all OTC firms.
 4. July 30, 1963: Senate passes a bill extending disclosure rules to OTC firms with at least \$1 million in assets and 500 shareholders.
 5. February, 1964: President Johnson endorses legislation and lobbies Congress to further its prospects for passage.
 6. March 19, 1964: House subcommittee passes bill, and it becomes evident Congress as a whole will pass it.
 7. August 5–6, 1964: House and Senate pass the bill.
 8. End of Period 1a, August 24, 1964: President Johnson signs 1964 Securities Acts Amendments into law on August 20, 1964.
 9. Beginning of Period 1b, August 24, 1964: OTC firms with at least \$1 million of assets and 750 shareholders required to initially file with SEC during this period.
 10. April 30, 1965: deadline for covered firms with fiscal year ends between July 1, 1964, and December 31, 1964, to initially file. Covered firms with fiscal year ends between January 1, 1965, and June 30, 1965, required to initially file 120 days after fiscal year end.
 11. October 31, 1965: last deadline for filing registration statement with SEC for newly covered firms.
 12. End of Period 1 (and Period 1b), November 15, 1965: Period 1 ends two weeks after October 31 deadline to allow for gradual dissemination of news about which firms filed with the SEC.
 13. Beginning of Period 2, November 15, 1965: virtually no new information about the law or which firms would comply with its requirements was revealed in this period. This period is used to assess the validity of the Period 1 findings.
 14. End of Period 2, December 31, 1966: sample of OTC firms' stock returns ends.
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that our analysis can exploit time variation in regulatory status. See Table I for an outline of key dates associated with the passage and implementation of the 1964 Securities Amendments, as well as a summary of the periods we define for our analysis. Period 1 runs from January 1, 1963, through November 15, 1965. During this period, the 1964 Amendments were initially proposed and passed into legislation, and it was revealed which individual firms registered under the 1964 Amendments with the SEC. We

assume that the full impact of the 1964 Amendments on stock returns occurs in this period. Data from this period are used to test the null hypotheses that the OTC groups had zero abnormal excess returns, relative to their corresponding size and book-to-market matched NYSE/AMEX (4-4) groups. A failure to reject the null would suggest that the disclosure requirements were not expected to produce information that was valued by outside shareholders (after accounting for compliance costs).

In interpreting our findings for Period 1, it is important to recall that we use 1962 information to assign firms to the OTC groups rather than ex post compliance behavior for two reasons. First, compliance is conditional on size. Therefore, if we had split firms by eventual compliance status, the groups would be constructed partially with information unavailable to the market at the beginning of Period 1. Such a procedure would mechanically bias the Period 1 treatment effect upwards. Forming groups based on ex ante variables avoids this problem. Second, some firms may manipulate their assets or shareholders so they do not have to comply with the law. The policy relevant treatment effect will account for such (likely unavoidable) manipulation rather than looking only at firms that comply.

We also divide Period 1 into two subperiods to separately examine the stock returns of the OTC groups in the 85 weeks lasting from January 1, 1963, through August 24, 1964 (i.e., Period 1a), and the 64 weeks from August 25, 1964, through November 15, 1965 (i.e., Period 1b). During Period 1a, the probability that a law extending the four disclosure requirements to OTC firms increased from some unknown level to one.¹⁰ Thus, this subperiod provides an opportunity to gauge the share of any overall Period 1 effect that is due to forward-looking asset markets' expectation of the law's value to shareholders.

During Period 1b, OTC firms above the size cutoffs were required to begin to comply with the Amendments' disclosure requirements. Here, we assess the share of any Period 1 effect

10. Although the *Special Study* was released on April 3, 1963, we suspect that its basic findings may have begun to permeate the investment community earlier. How much earlier is unknown, so the choice of January 1 as a beginning date has an element of arbitrariness. The choice of August 24, 1964, as an end date seems uncontroversial, as that is the date of the first issue of *Barron's* after Johnson signed the bill.

that is due to the market's incorrect *ex ante* expectations about the fraction of firms that would comply or the average financial position revealed in the registration statements. Because the 1964 Amendments were the first imposition of disclosure requirements in three decades, it may be reasonable to expect that market participants updated their estimates of the impact of these disclosure requirements (in terms of how likely firms were to be forced to comply and how much compliance would affect diversion) during this subperiod.

Period 2 runs from November 15, 1965, through the end of 1966, and during these 58 weeks virtually no new information about the law or which firms would comply with its requirements was revealed. We use this period to assess the validity of our approach. Specifically, rejection of the null of zero abnormal excess returns for affected OTC groups in this period would invalidate our research design and any findings from Period 1.

Finally, firms' deadlines for complying with the new disclosure requirements were based on their fiscal year end, and this provides an especially powerful test of whether shareholders valued the disclosure requirements. We implement an event study analysis with data from Period 1b to test whether firms had abnormal excess returns in the weeks that news of their compliance with the disclosure requirements became known to market participants. We assume that, after the passage of the 1964 Amendments, the market's expectation of any individual firm complying was between zero and one and that this probability then increased to one or declined to zero upon news about a firm's decision to comply.¹¹ Due to variation across firms in fiscal year ends, the first registrations under the 1964 Amendments were filed with the SEC in the fall of 1964 but initial filings continued through the end of October 1965. Consequently, this event study allows us to exploit firm-level (rather than group-level) variation.

IV. DATA

IV.A. Data Sources

We use the Center for Research in Security Prices (CRSP®) database to calculate returns of NYSE/AMEX firms for the 1963–

11. Even if the market had the correct expectations about the percentage of firms in one of the OTC groups that would comply with the law, it is unlikely that the market had the correct expectations about *each* firm in the group.

1966 period. We restrict the sample to those firms present in the first week of January 1963, and this sample of firms is intentionally not refreshed in later weeks. A corresponding electronic data set of OTC firms did not exist for the period we study, as OTC firms are not available in CRSP until December 1972.

We therefore created the equivalent of the CRSP database for 1196 OTC securities for the 1963–1966 period. The sample is comprised of securities that appeared in the January 7, 1963, issue of *Barron's* and were potentially affected by the 1964 Amendments. The bid and ask share prices for these firms were determined from *Barron's* weekly publications from the sample's four years. The relevant pages were photocopied and scanned in the United States and then converted to electronic files by Mascon Computer Services (P) Ltd. of India.¹² We formed a panel data file of these securities by using their reported name to match firms across issues of *Barron's*. Just like the NYSE/AMEX sample, the panel of OTC firms is never refreshed with entrants to the *Barron's* OTC stock tables, because our goal is to estimate the impact of the imposition of mandated disclosure requirements on an existing set of firms.

The calculation of weekly OTC returns required the compilation of data on weekly bid and ask share prices, dividends, stock splits, mergers, name changes, liquidations, and moves from OTC to NYSE/AMEX. We also collected data on the firms' industries, financial and accounting positions in 1962 and 1966, as well as information on which firms filed reports with the SEC in each year of our sample, and the exact date that complying OTC firms filed with the SEC for the first time. The resulting database is derived from hand-entered information from eleven separate sources: *Barron's*, *Standard and Poor's Annual Dividend Record*, *National Stock Summary (NSS)*, *Directory of Obsolete Securities*, *Moody's Industrial Manual*, *Moody's Public Utility Manual*, *Moody's Bank and Financial Manual*, *Moody's Transportation Manual*, *Directory of Companies Filing Annual Reports with the SEC Under the Securities Exchange Act of 1934 (SEC Directory)*, *U. S. SEC News Digest*, and *Security Owner's Stock Guide*. We used the COMPUSTAT electronic files to obtain accounting information for the NYSE/AMEX firms and supplemented this with information from the four *Moody's Manuals* for NYSE/AMEX

12. Mascon double entered the security name and the bid and ask prices from each issue of *Barron's*. Mascon guarantees a 99.9 percent accuracy rate.

firms not covered in COMPUSTAT. The Data Appendix provides some further details on the resulting data file, including a description of the numerous data quality checks, as well as our extensive procedures to assign exit returns to firms that disappear from our sample.

IV.B. Summary Statistics

Table II reports summary statistics from our data file for each of the four OTC groups and the firms listed on the NYSE/AMEX. Panel A displays the number of firms in each of the groups in the first week of 1963 and their survival rate in our sample as of the last week of 1966. The 0–4 group has 240 firms in the beginning of 1963. This group is considerably smaller than the 2–4 group, which initially has 738 firms, because many 1963 OTC firms had made a public offering in the previous 27 years. The samples of 0–0 and 2–2 firms are substantially smaller, because *Barron's* selected the largest and most actively traded OTC firms for inclusion in their stock tables. CRSP lists 1915 NYSE/AMEX firms that meet our sample requirements.

Survival rates vary across the different groups. The rates are roughly comparable among the 0–4, 2–4, and 4–4 groups and are even closer after matching on total market capitalization. This similarity in survival rates suggests that the OTC groups' attrition rates are due to genuine attrition, not insufficient data collection efforts on our part. The 0–0 and 2–2 groups have lower survival rates, because the 1964 Amendments' size cutoffs ensure that they are comprised of small firms. As will become evident below, these groups' small starting size and high attrition rates make meaningful inference difficult in parts of the subsequent analysis.

Panel B of Table II reports the percentage of firms that have complied with all four mandatory disclosure requirements as of July of the years 1963–1967.¹³ There was a dramatic increase in the percentage of OTC firms complying between 1964 and 1965 (the first year that many of these firms were required to file

13. Specifically, we consider an OTC firm to be in compliance with all four mandatory disclosure requirements if (1) the firm is in the 0–4 or 0–0 group and is included in that year's *SEC Directory* or is acquired by a firm listed in that publication; or (2) the firm is in the 2–4 or 2–2 group and is included in the *U. S. SEC News Digest* in an issue prior to July of the year, or is acquired by a firm listed in that publication; or (3) the firm moved to the NYSE/AMEX or was acquired by a firm on one of these exchanges prior to July of the year.

TABLE II
FIRM CHARACTERISTICS BY MANDATORY DISCLOSURE GROUPS, 1962

	0-4	2-4	0-0	2-2	4-4					
Panel A. Number of firms										
Week 1, 1963	240	738	124	94	1915					
Week 52, 1966	186	610	67	63	1668					
Survival rate	77.5	82.7	54.0	67.0	87.1					
Panel B. Percent of firms in week 1, 1963 sample that comply with all four mandatory disclosure requirements as of July of relevant year										
1963	9.2	4.7	4.0	0	100					
1964	12.1	16.4	5.7	4.3	100					
1965	74.6	69.7	22.6	23.4	100					
1966	74.6	80.5	28.2	35.1	100					
1967	80.8	82.4	37.1	54.3	100					
Panel C. Firm characteristics										
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
		(Median)		(Median)		(Median)		(Median)		(Median)
Information from <i>Barron's</i> /CRSP for 1963, week 1										
Share price	240	\$19.8	738	\$17.1	124	\$9.8	94	\$6.1	1915	\$25.0
		(\$12.3)		(\$12.9)		(\$4.4)		(\$4.4)		(\$19.4)
Bid-ask spread (%)	240	11.1%	738	9.9%	124	16.7%	94	15.3%	na	na
		(10.0%)		(9.1%)		(17.1%)		(14.9%)		na
Information from <i>Moody's</i> /COMPUSTAT for 1962										
# Shareholders	232	2946	695	4757	13	506	14	577	na	na
		(1861)		(2300)		(389)		(435)		na
Assets	240	\$44.5	738	\$33.4	100	\$2.7	89	\$3.0	1906	\$207.9
		(\$12.2)		(\$14.7)		(\$1.3)		(\$2.1)		(\$41.7)
Market capitalization	237	\$44.6	734	\$26.5	23	\$4.4	39	\$2.5	1915	\$189.1
		(\$9.1)		(\$10.4)		(\$1.9)		(\$2.3)		(\$28.5)
Book value of equity	230	\$25.5	727	\$15.3	19	\$3.5	27	\$2.1	1904	\$134.1
		(\$8.0)		(\$7.4)		(\$1.3)		(\$1.6)		(\$28.0)
Net income	238	\$2.7	731	\$1.6	99	\$0.1	89	\$0.2	1903	\$11.5
		(\$0.7)		(\$0.8)		(\$0.1)		(\$0.2)		(\$1.9)
Sales	223	\$45.9	718	\$32.3	99	\$3.3	86	\$4.6	1881	\$187.7
		(\$14.6)		(\$16.3)		(\$2.0)		(\$2.8)		(\$48.0)
Information from S&P Security Owners' Stock Guide										
% Held by										
institutions	120	4.04%	490	4.42%	8	2.52%	14	5.79%	na	na
		(2.19%)		(2.69%)		(1.33%)		(3.56%)		na

All firms tabulated in the OTC and NYSE/AMEX groups are present in their respective samples as of the first week of 1963. NYSE/AMEX firms tabulated exclude firms that enter from the *Barron's* sample during the 1963-1966 period. All dollar figures are in millions, except per share data. Means and medians are calculated using available observations.

with the SEC). This suggests that managers of many firms considered the costs of noncompliance (the statutory penalties or costs of reducing firm assets or number of shareholders or going private) to be greater than the benefits. Further, our rules for assigning OTC firms to the groups appear to be validated by the larger increases in filing probabilities for the 0–4 and 2–4 groups.

Panel C reports the means and medians (in parentheses) of a number of important variables as of the beginning of 1963, by OTC group. The number of firms with nonmissing data is also reported. The *Barron's* and CRSP data are used to determine the share prices (calculated as the mean of the bid and ask prices for OTC firms) and the bid-ask spreads as a percentage of the share price from the first week of 1963 for the OTC groups. The entries indicate that the median share price among 0–4 and 2–4 firms is nearly three times greater than the median among the 0–0 and 2–2 firms. This is informative because share price is typically correlated with market capitalization, which is unavailable for many of the 0–0 and 2–2 firms.

Numerous theoretical studies have argued that bid-ask spreads reflect information asymmetry between insiders with private information and outside shareholders (see Madhavan [2000] for further background). The bid-ask entries reveal that, after crudely controlling for size, firms that were already filing with the SEC at the start of 1963 had lower percentage bid-ask spreads than the firms that were free of SEC disclosure requirements. Specifically, the 2–4's (2–2's) percentage bid-ask spread is lower than the 0–4's (0–0's). We also explored this possibility more formally in a regression framework and found that after adjustment for the inverse of the share price, the bid-ask spread was about one percentage point lower for 1963 filers than nonfilers. These findings are consistent with the possibility that the information provided through registration with the SEC and the periodic filings reduced information differences between outside investors and insiders.

The remainder of the table reports on a series of 1962 firm-level variables collected from various issues of the *Moody's Manuals*, COMPUSTAT, and the S&P's *Security Owner's Stock Guide*. The mean (median) market capitalization (in millions of 1963 \$'s) for the 0–4 and 2–4 groups are \$44.6 (\$9.1) and \$26.5 (\$10.4), respectively. The total market capi-

talizations of these two groups in 2005 \$'s are \$66 billion and \$122 billion, respectively.

The final row examines the percentage of shares outstanding held by institutions. These data are available for roughly half and two-thirds of the 0–4 and 2–4 firms, respectively, and are based on holdings of investment companies, fire, casualty and life insurance companies, pension funds, and retirement systems. Conditional on nonmissing data, the mean of this variable is roughly 4 percent in both groups. This demonstrates that institutions did not have a prohibition against holding shares of firms that were not registered with the SEC. Consequently, it is unlikely that the 0–4 firms' positive abnormal excess returns documented below are due to downward sloping demand curves for these stocks and an increase in buyers eligible to purchase them after the passage of the 1964 Amendments.

Market capitalization is available for less than 30 percent of the 0–0 and 2–2 firms. The accounting data are more likely to be nonmissing, and these variables confirm that the 0–0 and 2–2 firms are much smaller than the 0–4 and 2–4 firms (e.g., see assets).

Overall, Panel C paints a mixed picture of the extent of informational asymmetries between insiders and outsiders. On the one hand, market capitalization and accounting data are available for virtually all 0–4 and 2–4 firms. The similarity in the availability of information in these groups of pre-1963 nonfilers and filers suggests that private markets via third parties like Moody's produced much of the information that shareholders were likely to value. On the other hand, the finding that the bid-ask spreads were larger for nonfilers undermines this view. One possibility is that these larger bid-ask spreads reflect an inability to set appropriate penalties for insiders that provided false information to the market.

V. EMPIRICAL METHODOLOGY

We construct time series of the equal-weighted portfolio returns for the OTC and NYSE/AMEX groups. This is denoted as

$$(1) \quad R_{gt} = \frac{1}{N_{gt}} \sum_{i=1}^{N_{gt}} R_{igt} = \frac{1}{N_{gt}} \sum_{i=1}^{N_{gt}} \left(\frac{P_{igt} - P_{ig,t-1} + D_{igt}}{P_{ig,t-1}} \right),$$

where R_{gt} is the return for holding the group g portfolio from the

end of week $t - 1$ to the end of week t . The return for each security in the portfolio, R_{igt} , is calculated as the change in the split-adjusted price per share from the end of week t to $t - 1$ (i.e., $P_{igt} - P_{ig,t-1}$), plus any split-adjusted dividends paid between the price observations (i.e., D_{igt}), all divided by the split-adjusted price at the end of week $t - 1$. P_{igt} is equal to the mean of the bid and ask prices for a security in week t . N_{gt} is the number of firms in group g in week t .

We model the returns using a standard four-factor model:

$$(2) \quad R_{gt} - R_{ft} = \alpha_g + \beta_{1g}(R_{mt} - R_{ft}) \\ + \beta_{2g}SMB_t + \beta_{3g}HML_t + \beta_{4g}MOM_t + \varepsilon_{gt},$$

where R_{ft} is the return on a risk-free asset, which is measured as the Treasury bill rate. This equation controls for the difference between market and risk-free returns, the size and book-to-market factors of Fama and French [1993], and a momentum factor based on Carhart [1997]. The market return, R_{mt} , is measured as the value-weighted CRSP return using all NYSE and AMEX firms present in weeks t and $t - 1$. The three factors are measured as the difference in the returns of portfolios of small and large stocks (SMB), value and growth stocks (HML), and stocks with high and low returns over the two to twelve months prior to the current date (MOM).¹⁴ The g subscript on the parameters underscores that the effect of the factors can vary across groups. ε_{gt} is the unobserved determinant of group g 's return.

α_g measures the abnormal excess returns specific to group g . The appeal of this measure of abnormal returns is that it has been purged of any covariance of group g 's return with the overall market and the three factors. This is important because a group may have high or low returns in the examined period simply because of its risk relative to the market or because it is disproportionately comprised of small, value, or high momentum firms.¹⁵ The fitting of equation (2) is considered a standard method to test for abnormal excess returns.

14. Kenneth French generously provided us with the SMB and HML daily factor series from 1963–1966. Using daily return data, we calculated the weekly momentum series based on the formulas on French's web page (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.)

15. In the cross section of U. S. stocks, it is well documented that the α 's from a four-factor model are much more tightly distributed around zero than the α 's from the basic CAPM using $R_{mt} - R_{ft}$ as the only factor.

It is tempting to interpret the estimated α_g 's from Period 1 for the OTC groups as the effect of the 1964 Amendments. The credibility of this interpretation rests on the assumption that the four-factor model has adequately adjusted for all systematic determinants of stock returns, except the 1964 Amendments. This assumption is invalid if there are shocks to the returns of OTC and NYSE/AMEX firms of the size or market to book ratio typical in one (or all) of the OTC groups that are not fully controlled for in equation (2). In this case, the estimated α_g would capture the effect of the 1964 Amendments and these shocks.

To mitigate the possibility of confounding the effects of the 1964 Amendments with unrelated shocks to stock returns, we difference versions of equation (2) for each OTC group and its corresponding size- and book-to-market-matched 4-4 group. An example of special interest is the difference between the 0-4 group and its corresponding 4-4 group, which becomes

$$(3) \quad R_{0-4,t} - R_{4-4,t}^{0-4} = (\alpha_{0-4} - \alpha_{4-4}) + (\beta_{1,0-4} - \beta_{1,4-4})(R_{mt} - R_{ft}) \\ + (\beta_{2,0-4} - \beta_{2,4-4})SMB_t + (\beta_{3,0-4} - \beta_{3,4-4})HML_t \\ + (\beta_{4,0-4} - \beta_{4,4-4})MOM_t + (\varepsilon_{0-4,t} - \varepsilon_{4-4,t}),$$

where $R_{4-4,t}^{0-4}$ equals the return of the 0-4 matched 4-4 group in week t . The differencing removes all shocks common to the 0-4 and matched 4-4 group from equation (3), so such shocks cannot cause the model to be specified incorrectly. The estimated β 's measure the difference in the loadings between the 0-4 and matched 4-4 groups.

The parameter of interest is $(\alpha_{0-4} - \alpha_{4-4})$, which is the difference in the abnormal excess returns between the 0-4 and the matched 4-4 group. We test the null hypothesis that this parameter is equal to zero for all OTC groups and interpret a rejection of the null in Period 1 as evidence that the 1964 Amendments affected stock returns. This test is also implemented in Period 2 as a check on the validity of the model. We also report estimates of α_g for the OTC groups from the estimation of equation (2), though these results are not our focus because they are less likely to be reliable. To account for the possibility of unequal variances across weeks, we present standard errors calculated with the Eicker-White formula that allows for heteroskedasticity of an unspecified form throughout the paper.

Four other features of our approach merit highlighting. First,

as equation (1) indicates, a portfolio's weekly return is calculated as the simple average across the returns of firms in that portfolio. This is equivalent to a portfolio that is rebalanced every week to ensure an equal weighting across all firms. The advantage of this approach is that returns can be calculated when the number of shares outstanding is unknown. The primary shortcomings are that such a portfolio would involve large transactions costs and that it does not mimic the buy-and-hold portfolio strategies that many investors utilize.

We probe the robustness of our results to alternative portfolio construction strategies in a few ways. We present results from a buy-and-hold strategy with equal initial weighting. This approach begins by putting an equal dollar value in each stock in the relevant OTC or NYSE/AMEX group and then assumes that no trades are made subsequently. In the calculation of the portfolio's return from date t to $t + 1$, stock i 's weight equals (value of holdings of stock i at t)/(total value of portfolio at t). Consequently, the weight on a particular stock evolves over time based on its returns relative to the rest of the portfolio.¹⁶ We also implement a value-weighted buy-and-hold strategy, where each firm's initial weight is equal to the firm's share of the portfolio's total market capitalization at the beginning of the relevant period.¹⁷ The weights then evolve in the same way as in the buy-and-hold with equal initial weighting approach.

Second, the estimated abnormal excess return from equation (3) may be biased by industry-specific shocks that are unrelated to the law if there are differences in the industry composition of the OTC and 4-4 groups. To probe this possibility, we also present results where the weekly returns for the companion 4-4 groups are calculated with the week-specific two-digit SIC industry weights of the relevant OTC groups.¹⁸

16. We use this approach to construct buy-and-hold portfolio returns rather than the approach of averaging firm-level buy-and-hold time series used by Loughran and Ritter [1995] and others. The statistical properties of the alternative approach are less well understood. We want to ensure that any differences in results between our equal-weighted portfolios and portfolios designed to mimic a buy-and-hold strategy are not driven by such issues.

17. This approach requires data on the shares outstanding to calculate firms' market capitalization. Because this variable is missing for 81 percent and 59 percent of the 0-0 and 2-2 firms, respectively, the results of the value-weighted buy-and-hold strategy are not fully comparable to those from the other strategies considered for these groups.

18. We determined the primary industry for all firms in the 0-4, 2-4, and 2-2 groups. We were unable to ascertain the industry for 24 firms in the 0-0 group. These firms are omitted from the calculation of industry adjusted returns,

Third, shocks specific to the OTC market that are unrelated to the law remain a potential source of confounding. To probe the robustness of the results to this possibility, we test whether the 0–4 group, which we suspect was the most affected by the legislation, had larger abnormal excess returns than the other OTC groups. The law also potentially affected the other groups, including the 0–0 and 2–2 groups because some of their firms grew large enough to have to comply. Therefore, any difference in returns between the 0–4 group and the other OTC groups is likely to understate the total effect of the mandatory disclosure requirements. Consequently, it is best conceived as a robustness check of the qualitative results.

Fourth, a drawback of our comparison of returns during Periods 1 and 2 is that there is no firm-level variation in the timing of these periods within the OTC groups. Recall, however, that there are firm-level differences in the timing of the resolution of the uncertainty surrounding which firms would comply with the 1964 Amendments that are largely due to variation in fiscal year ends. We exploit this variation to implement an event-study analysis in the weeks that news of firms' initial compliance became known to market participants.

VI. RESULTS

VI.A. Firm-Level Event Study of Initial Filing

The analysis begins with a firm-level event study of the effect of the announcement that OTC firms were officially in compliance with the 1964 Amendment's new mandatory disclosure requirements on stock returns. We obtained the precise dates that the SEC announced that prelegislation nonfiling firms had fulfilled the registration requirement and prelegislation filers had fulfilled the proxy and insider holdings/trades requirements for the first time. These official filing dates were collected from the daily issues of the *SEC News Digest*, which, as a matter of policy, published them 60 days after the SEC received the filings. This

so the 0–0 industry matched estimates are not fully comparable to results from the other portfolio construction methods.

We also attempted to match OTC firms to NYSE/AMEX firms on both industry and market capitalization. Specifically, we used all firms in the smallest six market capitalization deciles to calculate the 4–4 industry index returns. The results from this approach are similar to the industry only matched returns presented below.

delay means that the news of a firm's filing with the SEC may have become known to market participants as early as 60 days preceding the announcement or any time in between. For the remainder of this section, we refer to these firms as "new filers" and the dates of the announcement in the *SEC News Digest* as the "filing dates."

We use these filing dates as the basis of a firm-level event study of the effect of choosing to become a new filer. Specifically, we estimate a firm-level version of equation (3). The dependent variable is a firm's weekly return minus that week's average return for the firms in the size and book-to-market cell of NYSE/AMEX that the OTC firm would have belonged to at the beginning of 1963. This model is estimated with data from the 64-week-long Period 1b, which covers the weeks when most affected OTC firms were required to file with the SEC. The standard errors are clustered by week to account for the likely covariance in return residuals across firms within a week.

The substantive difference with equation (3) is that we add an indicator variable that equals one during the "event window." Its associated parameter is the focus of these regressions. Due to the uncertainty surrounding the exact date that the market learned that a firm had become a new filer, we define the event window so that it lasts for ten weeks. Specifically, it begins eight weeks prior to the SEC filing date and ends one week after this date. Week 0 in event time is defined to include the SEC filing date. The event window is extended one week beyond the filing date to allow the information to disseminate. Thus, the parameter on the event window indicator tests for abnormal excess returns in the ten-week period when news of a firm's decision to file became known in the marketplace.

Each column of Table III presents the results from a separate regression. We report the parameter estimates and standard errors on the event window indicator and the constant, along with the R^2 statistics. Columns (1)–(3) report results for the 0–4 group, and (4)–(6) contain the analogous findings for the 2–4 group. In columns (1) and (4) the sample is limited to new filers with filing dates during Period 1b, and the estimates are not adjusted for the market return or any of the three other return factors. Thus, this specification examines the differenced raw returns. Columns (2) and (5) report the results from the same sample after adjustment for the full four-factor model. Columns (3) and (6) also present adjusted results, but the respective samples now

TABLE III
FIRM LEVEL ANALYSIS OF SEC REGISTRATION

	0-4 - 4-4			2-4 - 4-4		
	(1)	(2)	(3)	(4)	(5)	(6)
1 (10-Week period from filing to registration)	0.358 (0.177)	0.350 (0.173)	0.344 (0.162)	0.369 (0.103)	0.350 (0.097)	0.312 (0.092)
Constant	0.002 (0.099)	0.082 (0.082)	0.060 (0.069)	-0.151 (0.090)	-0.040 (0.071)	-0.013 (0.051)
R^2	0.001	0.007	0.005	0.001	0.004	0.003
Factor model	None	4 Factors	4 Factors	None	4 Factors	4 Factors
Firms	145	145	215	417	417	693
Observations (firm-weeks)	8,845	8,845	12,824	25,857	25,857	42,277
Full sample	No	No	Yes	No	No	Yes

The sample in columns (6) and (3) includes all firms that belong to either group 0-4 or group 2-4 and for which returns during the period are available. Columns (1), (2), (4), and (5) limit the sample to firms that register with the SEC before the end of Period 1. The indicator variable 1 (16-week period from filing to registration) equals 1 between the 8 weeks before registration and the 1 week after registration (both inclusive). Columns (1) and (4) include a constant terms as the only other explanatory variable. Columns (2), (3), (5), and (6) also include the market, size, book-to-market, and momentum factors. Clustered standard errors, allowing for correlation across firms within weeks, are in parentheses.

also include 0-4 and 2-4 firms that moved to the NYSE/AMEX, filed after the end of Period 1b, or never filed.¹⁹ The specification and sample details are reported at the bottom of the table.

The results provide striking evidence of positive abnormal excess returns for 0-4 and 2-4 filers during the ten-week event window. The 0-4 filers have a positive abnormal excess return of about 0.35 percent per week during this event window, or a cumulative return of roughly 3.5 percent. These estimates would be judged statistically significant at conventional levels. This result is not affected by adjustment for the four factors and the change in sample. The 2-4 firms also experience a statistically significant positive abnormal excess return of approximately 0.35 percent per week for a cumulative return of 3.5 percent during

19. There are 215 (693) 0-4 (2-4) firms in the sample at the beginning of Period 1b. Of these firms 145 (417) have a filing date in this period, while 13 (24) others have a filing date between the end of Period 1b and the end of 1967; 30 (168) moved to the NYSE/AMEX in 1963, 1964, 1965, or 1966 where they were subject to all four mandatory disclosure requirements. The remaining 27 (84) firms either do not have a filing date by the end of 1967 or were acquired by a firm without a filing date by 1967. We did not implement the event study analysis for the 0-0 and 2-2 groups, because they included too few new filers in Period 1b.

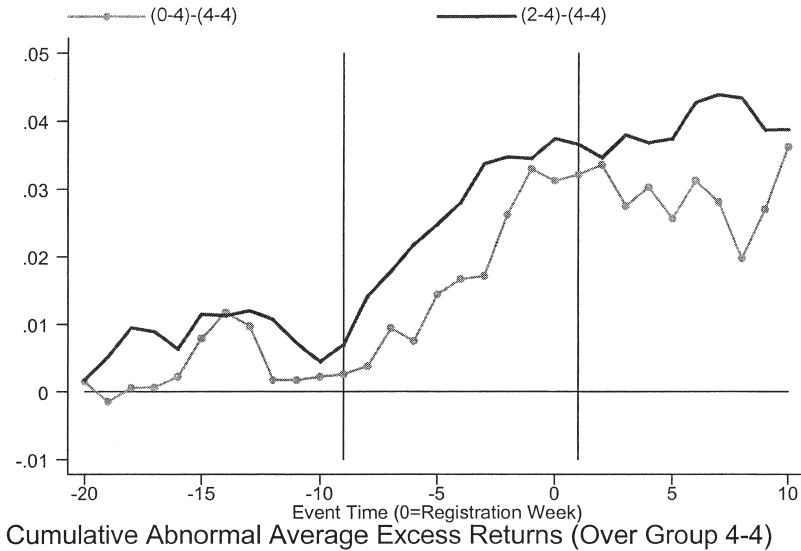


FIGURE I
 Cumulative Abnormal Excess Returns Near SEC Registration
 The vertical lines define a ten-week event window that starts eight weeks prior to the *SEC News Digest* announcement that a firm had registered under the 1964 Amendments and ends one week after this date. Abnormal returns are calculated based on the residuals from a firm-level regression that includes an intercept and four return factors (the excess return on the market portfolio and the size, book-to-market, and momentum factors).

the event window. Similarly, the 2–4 estimates are stable across the different specifications.²⁰

Figure I presents the 0–4 and 2–4 results graphically. These figures are derived from the column (2) and (5) specifications that adjust for the four factors, except that we have dropped the event window indicator. The average residuals are then calculated for each event week ranging from twenty weeks before registration through ten weeks after registration.²¹ These average residuals are considered the average abnormal excess return in a week,

20. When we fit the firm-level version of equation (2) that adjusts for the market and three other factors, the cumulative event window returns are 3.2 percent and 3.3 percent for the 0–4 and 2–4 registrants, respectively. Recall that this approach does not use the 4–4’s as a comparison group.

21. The distribution of filing dates is such that virtually all filers have observations for each of these event weeks. This is not the case when the graph is expanded beyond $t = -20$ or $t = 10$. Further, the filing dates for the 0–4 and 2–4 firms were distributed throughout Period 1b.

where the precise week is denoted by its distance from the week with the filing date. The cumulative average abnormal excess returns are plotted against the event week for the 0–4 and 2–4 groups. The vertical lines are drawn at event weeks –9 and +1.

The figure provides an even more demanding test of the hypothesis that initial filing is associated with abnormal excess returns, because it is possible to observe the pre- and postevent window trends. The flat 0–4 and 2–4 lines between week –20 and week –9 suggest that there are not abnormal excess returns in this period. During the event window, the cumulative abnormal excess return lines turn upward, graphically demonstrating the source of the results in Table VI. These lines are flat from week 1 through week 10.

Overall, Table III and Figure I provide strong evidence that the market rewarded firms that complied with the mandatory disclosure requirements specified by the 1964 Amendments.²² However, due to the forward-looking nature of asset markets, it is possible that OTC firms had abnormal excess returns in the period that the legislation was debated and ultimately passed. To estimate the full effect of the 1964 Amendments on stock returns, the next section tests for abnormal excess returns among the OTC groups over the entire Period 1.

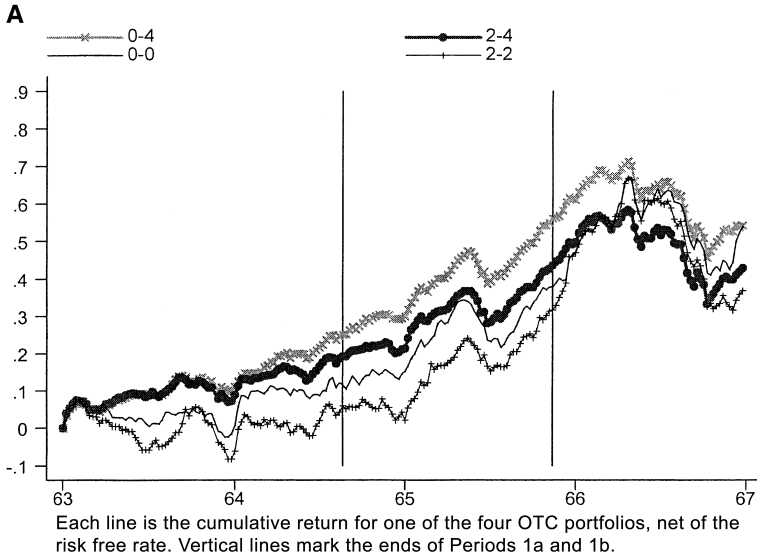
VI.B. Period 1

We begin with a graphical analysis of the unadjusted returns by OTC group. Figures IIA and IIB plot the cumulative average returns for the four OTC and matched NYSE/AMEX groups, respectively, over the course of our sample. Each data point represents a week's return for a group added to the sum of the return in all previous weeks. The first vertical line denotes the end of Period 1a and the second marks the end of Period 1b.

Figure IIA demonstrates that, by the end of Period 1, the cumulative returns (over the risk-free rate) for the 0–4, 2–4, 0–0, and 2–2 groups were 55.9, 43.8, 38.0, and 31.7 percent, respectively. These values for the raw return data are consistent with investors valuing the disclosures mandated by the 1964 Amend-

22. We had hoped to implement a similar analysis for the firms that chose *not* to comply with the disclosure requirements, where we would expect confirmation that a firm would not comply with the disclosure requirements to lead to negative abnormal excess returns. However, we were unable to isolate the precise dates that this information became public. In particular, it was common for the SEC to grant extensions of initial filing dates, and we were unable to determine the identities of the firms that received extensions.

Cumulative Returns by Group, OTC Firms, 1963-1966



Cumulative Returns by Group, NYSE/AMEX Comparison Groups, 1963-1966

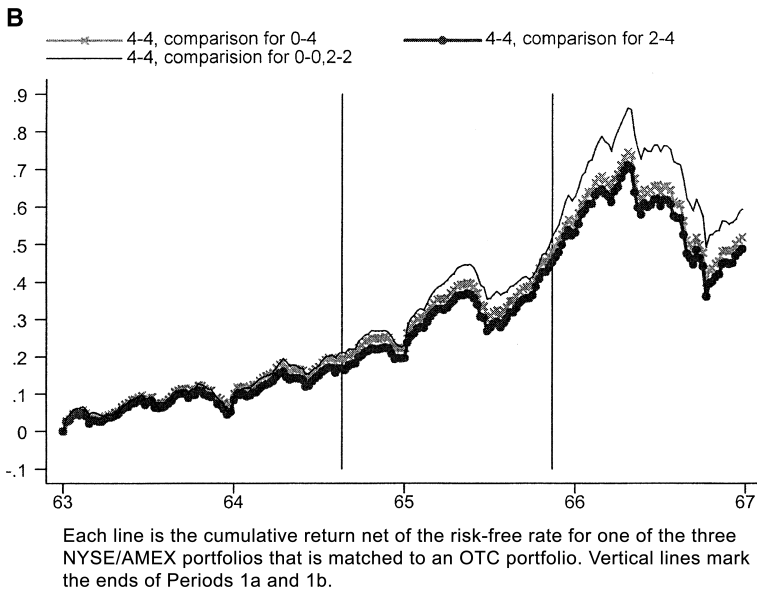


FIGURE II

ments, because the groups most likely to have to make new disclosures (0-4 and 2-4 firms) have the highest returns. Further, the raw returns are consistent with the predictions that the 0-4's would have the largest returns and the 2-2's would have the lowest returns in this period. In contrast, Figure IIB shows that these differences in returns are not evident in the three sets of NYSE/AMEX comparison firms with matching size and book-to-market characteristics.

Figures IIIA and IIIB depict the unadjusted cumulative returns for the 0-4, 2-4, and their matched 4-4 groups. Figure IIIA reveals that the 0-4 group's cumulative return exceeds the matched 4-4's returns by 7.8 percent over the course of Period 1. Notably, the 0-4's excess returns first become apparent in mid-1964 when the legislative antecedents of the 1964 Amendments gained momentum in Congress and increase steadily for the remainder of the period. Therefore, the subsequent results will not be sensitive to reasonable changes in the start and end dates of the event window. From Figure IIIB it is evident that the 2-4 group and its matched 4-4 group had virtually identical raw returns in this period.²³

We now turn to our statistical analysis of the Period 1 stock returns. Table IV presents estimates of the abnormal excess returns for the 0-4 group in the first panel and the subsequent panels report results for the 2-4, 0-0, and 2-2 groups.²⁴ Within a panel, we report estimates of α , its standard error (in parentheses), and the R^2 statistic from the fitting of two versions of equation (2) and six variants of equation (3). We also report p -values from separate tests that the 0-4's estimated α is equal to the estimated α 's for the other OTC groups within a specification (i.e., within a column). These tests are conducted by differ-

23. The 0-0 and 2-2 groups underperformed their NYSE/AMEX comparison group, but due to the small size of the 0-0 and 2-2 groups, their returns are estimated imprecisely. This makes a graph comparing their returns with their matched 4-4 group less informative, so it is not presented here. The imprecision of comparisons between these groups is demonstrated in Table IV below.

24. Period 1 spans 149 weeks, but the regressions only include 148 observations because the OTC and NYSE/AMEX stock returns are not comparable for the week of John F. Kennedy's assassination. OTC trading was suspended immediately upon the news that Kennedy had been wounded, but it continued for at least half an hour on the NYSE and AMEX (*Wall Street Journal*, November 27, 1963). As a result, NYSE/AMEX firms had large declines in that week while the returns of OTC firms were in line with a typical week. Consequently, we drop prices from the assassination week and treat the returns from the week before the assassination to the week after as a single observation.

TABLE IV
AVERAGE ABNORMAL EXCESS RETURN:
PERIOD 1, JANUARY 1963–NOVEMBER 15, 1965

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	0-4		(0-4)-(4-4)					
$\alpha_{0-4}^{Pd,1}$ (%)	0.378	0.187	0.053	0.078	0.097	0.129	0.083	0.149
	(0.077)	(0.050)	(0.048)	(0.048)	(0.046)	(0.048)	(0.048)	(0.047)
R^2	—	0.639	—	0.028	0.191	0.195	0.213	0.160
	2-4		(2-4)-(4-4)					
$\alpha_{2-4}^{Pd,1}$ (%)	0.296	0.095	-0.010	0.013	0.024	0.057	0.035	0.056
	(0.080)	(0.049)	(0.045)	(0.043)	(0.040)	(0.043)	(0.048)	(0.039)
R^2	—	0.667	—	0.026	0.133	0.120	0.166	0.079
	0-0		(0-0)-(4-4)					
$\alpha_{0-0}^{Pd,1}$ (%)	0.257	0.063	-0.095	-0.075	-0.095	-0.109	-0.116	0.000
	(0.110)	(0.092)	(0.096)	(0.095)	(0.098)	(0.117)	(0.135)	(0.105)
R^2	—	0.326	—	0.004	0.056	0.040	0.056	0.059
	2-2		(2-2)-(4-4)					
$\alpha_{2-2}^{Pd,1}$ (%)	0.214	0.033	-0.138	-0.131	-0.125	-0.071	-0.110	-0.021
	(0.130)	(0.115)	(0.106)	(0.107)	(0.114)	(0.116)	(0.127)	(0.112)
R^2	—	0.296	—	0.00	0.001	0.000	0.038	0.024
Test of equal α , p -value								
$\alpha_{0-4}^{Pd,1} = \alpha_{2-4}^{Pd,1}$	0.014	0.015	0.064	0.054	0.053	0.046	0.284	0.020
$\alpha_{0-4}^{Pd,1} = \alpha_{0-0}^{Pd,1}$	0.149	0.167	0.100	0.087	0.049	0.051	0.146	0.160
$\alpha_{0-4}^{Pd,1} = \alpha_{2-2}^{Pd,1}$	0.097	0.128	0.054	0.032	0.030	0.062	0.107	0.100
Factor model	None	4F	None	CAPM	4F	4F	4F	4F
Buy and hold	No	No	No	No	No	Yes	Yes	No
Value weighted	No	No	No	No	No	No	Yes	No
Industry matched	No	No	No	No	No	No	No	Yes

The entries in columns (1) and (2) are the parameter estimates and heteroskedastic-consistent standard errors (in parentheses) on the constant from the estimation of versions of equation (2). Columns (3)–(8) are based on estimates of equation (3). Bold-face panel headings denote groups and the specification details are at the bottom of the table. The sample size is 148 weeks, but it is based on 149 calendar weeks. See footnote 24 for details. “CAPM” indicates that the regression controls for the return on the market. “4F” indicates controls for the market, size, book-to-market and momentum factors. Details on these factors, as well as our methodology for “buy and hold” returns, value weighting, and adjusting for industry returns are provided in the text.

encing the dependent variables, estimating equation (3), and testing whether the α of the differenced equation is significant.

In columns (3)–(7) the 4–4 groups are constructed, as described above, so that the distributions of the underlying firms’ market capitalizations and ratio of book to market are similar to the distribution of these variables in the corresponding OTC groups. In column (8) we use an industry-matched 4–4 group as the comparison but do not do any size or book to market matching

due to sample size issues. The table also explores the sensitivity of the results to alternative portfolio construction rules. In all columns, except (6) and (7), we assume that investors in our constructed portfolios rebalance their holdings every week to keep them equally weighted across all securities. Column (6) reports the results from a buy-and-hold strategy with equal initial weighting. In column (7) the portfolios are based on a value-weighted buy-and-hold strategy.²⁵ The specification details for each column are summarized at the bottom of the table.

We begin with the equation (2) specifications. The unadjusted entries in column (1) demonstrate that the 0–4's had a mean weekly return (above the risk-free rate) of 0.378 percent over the 149-week period. Notably, the null hypothesis of equal returns for the 0–4 and 2–4 groups can be rejected at the 2 percent level. In the case of the smaller 0–0 and 2–2 groups, the analogous nulls can be rejected at the 15 and 10 percent levels, respectively, reflecting the imprecision of our estimates of these groups' returns. Overall, the raw data reveal that the differences in the returns of the group expected to have the largest treatment effect and the other OTC groups are statistically distinguishable at reasonable confidence levels.

In column (2) the OTC groups' returns are adjusted with the standard four-factor model, which is considered a robust method for detecting abnormal excess returns. The entries indicate that the 0–4 and 2–4 groups had average abnormal excess weekly returns of 0.187 percent and 0.095 percent, respectively. These estimates imply cumulative abnormal excess returns of 27.7 percent and 14.1 percent and are statistically and economically significant. In contrast, the point estimates for the 0–0 and 2–2 groups are smaller and statistically insignificant. Appendix 2 reports the estimated β 's from fitting equation (2) for the four OTC groups and three corresponding 4–4 groups for Period 1 (as well as Period 2).

Columns (3) through (8) use the matched 4–4 groups as “control” groups to avoid confounding the effect of the law with shocks that were unrelated to the 1964 Amendments. The column (3) entry for the 0–4 group is not adjusted for any of the four return factors, and it indicates a weekly abnormal excess return

25. We drop one 0–4 firm (Royal Dutch/Shell) from the value weighted regressions, because it is 21 times larger than the next biggest firm and accounts for 57 percent of that group's total market capitalization at the beginning of the sample.

of 0.053 percent. This is the statistical summary of Figure IIIA, and it underscores that the Period 1 differences between the 0–4's and their corresponding 4–4 group in that figure are not statistically meaningful. However, the nulls that the 0–4's returns are equal to the other OTC groups' returns (after subtracting the matching 4–4 control group returns from each of the OTC groups' returns) can all be rejected at the 10 percent level, further underscoring the differences in returns across OTC groups.

The point estimates in the remaining columns range between 0.078 and 0.149 percent, which imply cumulative returns ranging between 11.5 percent and 22.1 percent.²⁶ The CAPM estimate would be judged to be statistically significant at the 11 percent level, while two of the four-factor estimates are significant at the 1 percent level or better, one at the 4 percent level, and one at the 9 percent level. The stability of the point estimates across the different specifications is reassuring. However, the difference between these results and the unadjusted estimate in column (3) underscores that the validity of ascribing the difference in returns between the 0–4 group and its matched 4–4 group to the 1964 Amendments rests on the validity of the standard model for stock returns that adjusts for the market return and three factors.²⁷ This contrasts with the findings from the event study and the comparisons of returns across the four OTC groups, neither of which hinge on whether we control for the four return factors.

We now turn to the results of fitting equation (3) for the 2–4 group reported in columns (3) through (8) of the second panel. The factor-adjusted point estimates range from 0.013 to 0.057 percent, which imply a cumulative abnormal excess return of 1.9–8.4 percent. Although these estimates are all in a relatively tight

26. The estimates of the factor loadings (i.e., the β 's) will be biased if the securities of OTC firms are less likely than those of NYSE/AMEX firms to be traded between weekly price observations. In this case, the estimated α 's are likely to be biased. We suspect that "stale" OTC prices are unlikely to be a source of bias, because *Barron's* only includes the most heavily traded OTC firms. Nevertheless, we also estimated models for two-week and four-week returns where this issue is much less relevant. The 0–4's estimated α (standard error) from specifications that use the matched 4–4's as controls and adjust for the market and three factors are 0.180 (0.080) and 0.418 (0.110) for the two- and four-week returns, respectively. When these estimates are divided by two and four, they are nearly identical to the estimates in column (5). We conclude that these results are not due to stale OTC prices.

27. Among the different factors, the momentum factor has the least influence on the estimated α . Further, the null hypothesis that the parameter on the momentum factor is equal to zero cannot be rejected for any of the OTC or NYSE/AMEX groups in Period 1 (see Appendix 2).

range, none of them differs statistically from zero at the 10 percent level. Overall, the 2-4's findings provide modest support for the view that investors valued the introduction of proxy and insider trading disclosure requirements for firms that were already registered with the SEC and filing periodic reports. However, the imprecision of these estimates tempers the strength of any conclusions.

The third and fourth panels report the results for the 0-0 and 2-2 groups. In columns (3) through (8) all of the estimated α 's for these groups are negative and are smaller than the 0-4 and 2-4 groups' estimated α 's. At least partially due to the small sample sizes for these groups, the 0-0's and 2-2's standard errors are generally more than twice as large as in the first two panels. This imprecision is evidenced by the fact that only three of the twelve estimates have an associated *t*-statistic greater than one.

Table V presents the results from fitting equations (2) and (3) in Periods 1a and 1b separately. We only report the results for the 0-4 and 2-4 groups, because the estimated α 's for the 0-0 and 2-2 groups in these subperiods are even more poorly determined. The intent here is to assess whether the Period 1 abnormal excess returns were concentrated in the weeks that the law was debated and passed (Period 1a) or the weeks when firms' compliance uncertainty was resolved and information about their financial position was revealed (Period 1b).

The results suggest that the 0-4's had positive abnormal excess returns in both subperiods, but the bulk of them occurred while the law was debated and signed into law. The preferred Period 1a estimates in columns (4) through (8) are in a relatively narrow range and imply a cumulative abnormal excess return ranging from 8.4 percent to 13.9 percent. Two of these five estimates statistically differ from zero at the 5 percent level; the other three only at the 15 percent level.

The point estimates from the shorter Period 1b are generally smaller, more sensitive to changes in specification, and less likely to statistically differ from zero. However, they jointly seem to suggest that the 0-4's had positive abnormal excess returns in this subperiod too. For example, the estimate from the equal weighted four-factor model in column (5) implies a cumulative abnormal excess return of roughly 6.8 percent. It appears that initial filing announcements can-

TABLE V
 AVERAGE ABNORMAL EXCESS RETURN: JANUARY 1963–AUGUST 24, 1964
 (PERIOD 1a) AND AUGUST 24, 1964–NOVEMBER 15, 1965 (PERIOD 1b)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	0-4		(0-4)-(4-4)					
$\alpha_{0-4}^{Pd\ 1a}$ (%)	0.299 (0.095)	0.223 (0.076)	0.066 (0.064)	0.100 (0.065)	0.115 (0.068)	0.141 (0.070)	0.122 (0.074)	0.165 (0.068)
R^2	—	0.521	—	0.035	0.132	0.153	0.186	0.172
	0-4		(0-4)-(4-4)					
$\alpha_{0-4}^{Pd\ 1b}$ (%)	0.483 (0.127)	0.206 (0.067)	0.036 (0.072)	0.053 (0.071)	0.106 (0.065)	0.133 (0.067)	0.039 (0.057)	0.174 (0.069)
R^2	—	0.778	—	0.021	0.328	0.281	0.252	0.194
	2-4		(2-4)-(4-4)					
$\alpha_{2-4}^{Pd\ 1a}$ (%)	0.230 (0.102)	0.129 (0.081)	0.030 (0.061)	0.052 (0.059)	0.052 (0.066)	0.086 (0.067)	0.141 (0.070)	0.088 (0.065)
R^2	—	0.583	—	0.016	0.097	0.089	0.140	0.127
	2-4		(2-4)-(4-4)					
$\alpha_{2-4}^{Pd\ 1b}$ (%)	0.381 (0.128)	0.112 (0.058)	-0.062 (0.065)	-0.039 (0.063)	0.026 (0.053)	0.058 (0.060)	-0.068 (0.064)	0.061 (0.049)
R^2	—	0.787	—	0.046	0.265	0.229	0.282	0.112
Test of equal α , p-value								
$\alpha_{0-4}^{Pd\ 1a} = \alpha_{2-4}^{Pd\ 1a}$	0.133	0.070	0.426	0.278	0.214	0.258	0.773	0.149
$\alpha_{0-4}^{Pd\ 1b} = \alpha_{2-4}^{Pd\ 1b}$	0.045	0.091	0.057	0.079	0.153	0.173	0.053	0.060
Factor model	None	4F	None	CAPM	4F	4F	4F	4F
Buy and hold	No	No	No	No	No	Yes	Yes	No
Value weighted	No	No	No	No	No	No	Yes	No
Industry matched	No	No	No	No	No	No	No	Yes

The entries in columns (1) and (2) are the parameter estimates and heteroskedastic-consistent standard errors (in parentheses) on the constant from the estimation of versions of equation (2). Columns (3)–(8) are based on estimates of equation (3). Bold-face panel headings denote groups and the specification details are at the bottom of the table. The sample size is 84 weeks for Period 1a and 64 weeks for Period 1b. “CAPM” indicates that the regression controls for the return on the market. “4F” indicates controls for the market, size, book-to-market, and momentum factors. Details on these factors, as well as our methodology for “buy and hold” returns, value weighting, and adjusting for industry returns are provided in the text.

not account for all of the abnormal excess returns in this subperiod.²⁸

The 2–4 results fail to provide convincing evidence of abnor-

28. The largest difference between the Periods 1a and 1b estimates in columns (4) through (8) occurs in the value-weighted buy-and-hold specification, column (7). In this specification the abnormal excess returns are concentrated in Period 1a. Because there was less compliance uncertainty surrounding large firms, it is not surprising that these Period 1b returns, which weight firms according to their size, are smaller.

mal excess returns in either subperiod. The Period 1a point estimates are all positive, although it is only possible to reject a zero at conventional levels in one of the specifications. The Period 1b estimates are sensitive to changes in the specification and are poorly determined.

Overall, the Period 1 results suggest that the mandatory disclosure requirements introduced by the 1964 Amendments increased market participants' valuations of the 0–4 firms by 11.5–22.1 percent. There is little evidence that the Amendments affected the stock returns of the other OTC groups in this period.

VI.C. Period 2

Recall that Period 2 is after the law has passed and the vast majority of complying firms have begun to file with the SEC. Consequently, our expectation is that the OTC groups will have zero abnormal excess returns in this period. If this null hypothesis is rejected by the data, it raises the possibility that our research design or the four-factor model is invalid here, which would undermine the credibility of the results from Period 1.

Table VI is structured identically to Table IV and reports the Period 2 results. The table provides little evidence of abnormal excess returns for any of the OTC groups. For example, none of the 32 estimates would be judged to be statistically different from zero at the 10 percent level. It is notable that even the less robust equation (2) specification fails to find evidence of abnormal excess returns. Overall, the findings from this 58-week period support the validity of our approach and lend credibility to the hypothesis that the estimated effects in Period 1 are due to the 1964 Amendments.

VI.D. Operating Performance

As we discussed in Section II, our hypothesis is that mandatory disclosure laws bind managers to focus more on maximizing shareholder value. The evidence of positive abnormal excess returns for the 0–4 group in this period is consistent with this hypothesis but fails to shed light on exactly why market participants were willing to pay more for an ownership stake. This subsection explores one channel by testing whether OTC firms experienced improvements in operating performance relative to 4–4 firms between 1962 and 1966.

Table VII reports the results of four firm-level operating performance regressions. In columns (1) and (2) the dependent

TABLE VI
 AVERAGE ABNORMAL EXCESS RETURN:
 PERIOD 2, NOVEMBER 15, 1965, THROUGH END OF 1966

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	0-4		(0-4)-(4-4)					
$\alpha_{0-4}^{Pd,2}$ (%)	-0.031	0.076	-0.097	-0.149	-0.022	-0.020	-0.105	0.018
	(0.231)	(0.083)	(0.111)	(0.090)	(0.077)	(0.115)	(0.093)	(0.095)
R^2	—	0.912	—	0.373	0.669	0.586	0.666	0.395
	2-4		(2-4)-(4-4)					
$\alpha_{2-4}^{Pd,2}$ (%)	-0.014	0.060	-0.075	-0.127	-0.035	0.007	-0.034	-0.022
	(0.235)	(0.073)	(0.106)	(0.082)	(0.074)	(0.092)	(0.088)	(0.069)
R^2	—	0.938	—	0.409	0.627	0.602	0.765	0.416
	0-0		(0-0)-(4-4)					
$\alpha_{0-0}^{Pd,2}$ (%)	0.276	0.303	0.150	0.111	0.172	0.169	0.336	0.215
	(0.318)	(0.212)	(0.206)	(0.213)	(0.235)	(0.261)	(0.317)	(0.235)
R^2	—	0.634	—	0.059	0.085	0.082	0.131	0.115
	2-2		(2-2)-(4-4)					
$\alpha_{2-2}^{Pd,2}$ (%)	0.092	0.033	-0.035	-0.062	-0.098	-0.080	-0.041	-0.054
	(0.334)	(0.160)	(0.180)	(0.186)	(0.166)	(0.199)	(0.237)	(0.150)
R^2	—	0.748	—	0.038	0.062	0.040	0.166	0.201
Test of equal α , p-value								
$\alpha_{0-4}^{Pd,2} = \alpha_{2-4}^{Pd,2}$	0.765	0.801	0.703	0.708	0.841	0.738	0.404	0.619
$\alpha_{0-4}^{Pd,2} = \alpha_{0-0}^{Pd,2}$	0.117	0.281	0.213	0.214	0.339	0.432	0.154	0.395
$\alpha_{0-4}^{Pd,2} = \alpha_{2-2}^{Pd,2}$	0.532	0.803	0.751	0.668	0.680	0.787	0.797	0.697
Factor model	None	4F	None	CAPM	4F	4F	4F	4F
Buy and hold	No	No	No	No	No	Yes	Yes	No
Value weighted	No	No	No	No	No	No	Yes	No
Industry matched	No	No	No	No	No	No	No	Yes

The entries in columns (1) and (2) are the parameter estimates and heteroskedastic-consistent standard errors (in parentheses) on the constant from the estimation of versions of equation (2). Columns (3)–(8) are based on estimates of equation (3). Bold-face panel headings denote groups and the specification details are at the bottom of the table. The sample size is 58 weeks. “CAPM” indicates that the regression controls for the return on the market. “4F” indicates controls for the market, size, book-to-market, and momentum factors. Details on these factors, as well as our methodology for “buy and hold” returns, value weighting, and adjusting for industry returns are provided in the text.

variable is the change in net income (profits) between 1966 and 1962, normalized by 1962 market capitalization. We normalize by market capitalization here, because income can be zero or negative. In columns (3) and (4) the dependent variable is the percentage change in sales between 1966 and 1962. Both net income and sales growth are considered important measures of operating performance, although net income is more closely related to stock returns.

TABLE VII
CHANGE IN OPERATING PERFORMANCE, 1962–1966

Dependent variable	(1)	(2)	(3)	(4)
	Net income growth		Sales growth	
Sample	Survivors	Assigned	Survivors	Assigned
0–4 Indicator	0.038 (0.015)	0.030 (0.012)	1.091 (0.149)	0.835 (0.121)
2–4 Indicator	0.013 (0.009)	0.012 (0.008)	0.171 (0.091)	0.161 (0.077)
ln (Assets 1962)	–0.002 (0.003)	–0.001 (0.002)	–0.104 (0.025)	–0.089 (0.022)
R^2	0.020	0.019	0.063	0.049
N	2408	2799	2331	2741

The entries in each column report the results from separate regressions. In columns (1) and (2) the dependent variable is “Net Income Growth,” defined as (Net Income in 1966 – Net Income in 1962)/Market Capitalization in 1962. In columns (3) and (4) the dependent variable is “Sales Growth,” and it is equal to (Sales in 1966 – Sales in 1962)/Sales in 1962. The first three sets of entries are the parameter estimates and standard errors (in parentheses) for the variables listed in the row headings. Sample is based on 0–4, 2–4, and 4–4 firms as of January 1963. The excluded category is 4–4 firms. In columns (1) and (3), the sample is restricted to those firms for which comparable 1966 information was available. In columns (2) and (4) firms with missing growth information were assigned the tenth or fiftieth percentile of firms in its group (see text for further details). The top and bottom 1 percent of observations in terms of the dependent variable are dropped. Regressions include one-digit SIC dummies. The sample means of the dependent variable in columns (1)–(4) are 0.093, 0.091, 0.863, and 0.857, respectively.

The starting sample includes all 0–4, 2–4, and 4–4 firms present in the first week of 1963. In columns (1) and (3) the sample is restricted to firms with known values for the dependent variable, which reduces the working samples to 2408 and 2331, respectively. Although the survival rates for the 0–4 and 2–4 OTC groups and the 4–4 group are similar, sample selection concerns may still be valid.²⁹

Columns (2) and (4) address this sample selection issue by assigning the fiftieth and tenth percentiles of the dependent variables to firms with missing values for the dependent variables. Specifically, firms with missing values that exit for “negative” reasons (for NYSE/AMEX firms: liquidation or delisting; for OTC firms: liquidation or exit from our sample with a price less than \$2) are assigned the tenth percentile of the dependent variable among firms in their group (i.e., 0–4, 2–4, and 4–4). Firms

29. More than half of the firms with missing value of the dependent values are firms that were involved in mergers between 1962 and 1966. We do not use operating performance data for 1966 for firms involved in mergers because these data may not be comparable to the 1962 numbers.

with missing values that exit for more “neutral” reasons (for NYSE/AMEX firms: mergers; for OTC firms: mergers, name changes, exit from our sample with a price above \$2, and moves to CRSP) are assigned the fiftieth percentile of the dependent variable for their group.

We report the parameter estimates and standard errors (in parentheses) on indicator variables for 0–4 and 2–4 status. The excluded category is 4–4 firms. The regression also adjusts for the log of 1962 assets to account for differences in growth related to size and for one-digit industry dummies. Due to concerns about outliers (especially data entry errors), we deleted observations that were in the top and bottom 1 percent of the dependent variable. The subsequent results are not sensitive to reasonable alternatives (e.g., 2 and 5 percent rules).

The results indicate that 0–4 firms had the largest improvements in the two measures of operating performance. Specifically, the 0–4 firms’ change in net income relative to initial market value was about 0.030–0.038 larger than the 4–4’s. The mean of the dependent variable for 4–4 firms is 0.086, so the 0–4’s increase in this measure of income growth was 35–44 percent larger than the 4–4’s. The 2–4 firms’ point estimates are roughly a third as large as the 0–4’s and would not be judged to be statistically significant by conventional criteria.

The sales growth results indicate that 0–4 firms’ total sales increased by a statistically significant 84–109 percent more than the unaffected 4–4 firms. The 2–4 firms had smaller relative increases in sales growth (i.e., 16–17 percent), and these estimates border on statistical significance at the 5 percent level. To put these numbers in context, the mean sales growth of 4–4 firms was roughly 70 percent, so the 0–4 firms’ sales increase appear quite large. To investigate this further, we estimated median regressions on the column (3) and (4) samples. They produced 0–4 indicator point estimates of 0.087 and 0.174, respectively, both of which are statistically significant. It is evident that the 0–4 conditional mean results in Table VII are heavily influenced by the top part of the percentage sales growth distribution.³⁰

Overall, these results provide evidence that as soon as one year after most firms’ compliance deadlines, the operating per-

30. The 2–4 point estimates from the median sales growth regressions are qualitatively similar to the ones in Table VII. Further, median regression has little effect on the point estimates for the 0–4 and 2–4 indicators in net income regressions.

formance of 0–4 (and to a lesser degree 2–4) firms had improved, relative to 4–4 firms. These findings are consistent with the hypothesis that the mandatory disclosure requirements caused managers to focus more directly on maximizing shareholder value.³¹

VII. INTERPRETATION

Based on the varied evidence presented in this paper, we conclude that investors valued the mandatory disclosure requirements imposed on 0–4 firms by the 1964 Amendments. We now try to put these numbers in some context. The estimates of the cumulative abnormal excess returns in Period 1 for the 0–4 firms ranged from 11.5 to 22.1 percent. Among the 236 0–4 firms with nonmissing market capitalization data, the total market capitalization was \$4.5 billion (1963 \$). These results imply that the 1964 Amendments created \$0.5 to \$1.0 billion (1963 \$) or \$3.2 to \$6.2 billion (2005 \$), of value for stockholders.³² These numbers understate the total increase in market capitalization associated with the legislation, because our sample only includes a quarter of the nearly 900 firms that filed with the SEC for the first time after passage of the 1964 Amendments (although it probably has many of the largest ones). As the conceptual framework highlighted, these numbers are an upper bound on the welfare gain associated with these mandatory disclosure regulations, because at least part of the gain in market capitalization reflects a transfer of insiders' resources to outside shareholders.

In light of the magnitude of the increases in market capitalization, it is natural to wonder why shareholders had not previously banded together to try to capture the \$3.2 to \$6.2 billion by forcing insiders to move the companies to the NYSE/AMEX. We suspect that there are several possible reasons. First, it is likely that some of the 0–4 firms did not meet the listing requirements for the NYSE/AMEX (at the start of 1963, 48 percent of OTC firms in group 0–4 had market capitalizations below the twenty-fifth

31. Another potential mechanism for the 0–4's Period 1 abnormal excess stock returns is that the mandatory disclosure requirements might affect the liquidity of firms' shares, which is thought to be reflected in bid-ask spreads. We could not investigate this possibility in a meaningful way because there are not separate bid and ask prices for 4–4 firms and a substantial fraction of the 0–4's move to the NYSE/AMEX.

32. To avoid potentially overstating the effects, this calculation excludes the one 0–4 firm, Royal Dutch Company, which by itself accounts for 57 percent of group 0–4's market capitalization (and the exclusion of which leaves results virtually unchanged, except naturally for the value weighted approach).

percentile of the market capitalization of NYSE/AMEX firms). Second, insiders may have owned more than half of the shares, making it impossible for outside shareholders to force a move to the NYSE/AMEX. Third, it is probable that the \$3.2 to \$6.2 billion figure overstates the resources that could be captured by shareholders, because it is likely that at least part of this figure reflects a transfer from insiders via reduced diversion or increased effort. To make this effective transfer, it seems reasonable to assume that insiders would have required increased compensation. Fourth, the coordination of efforts to induce a firm to move to the NYSE/AMEX has the features of a classic public goods problem because the activist shareholder(s) cannot capture the full benefits of their efforts.

We now discuss the internal and external validity of our results. With regard to internal validity, a few issues merit highlighting. First, some of the Period 1 unadjusted and adjusted results differ. In particular, the difference between the raw returns of the 0–4 group and its matched 4–4 group are modest and statistically indistinguishable from zero. The differences in their returns are larger and statistically significant after adjustment for the market return and three other factors. Thus, the validity of the claim that the mandatory disclosure requirements caused abnormal excess returns for the 0–4's relative to their 4–4 comparison group in Period 1 rests on the validity of the standard four-factor model of stock returns. This contrasts with the event study results, the 0–4's higher returns relative to the other OTC groups, the Period 2 results, and the operating performance results that do not rely on factor adjustment.

Second, several strands of the existing literature suggest that the large abnormal excess returns we find from improved protection of outsiders and associated reduction in expropriation by insiders are plausible. For example, Schwert [1996] documents that takeover bids (often intended to displace current management) on average are associated with about 25 percent cumulative abnormal excess returns for the target company, with larger total effects for deals that go through. Furthermore, even the type of insider trading legal under the 1933, 1934, and 1964 Acts is associated with substantial profits to insiders and corresponding losses to outsiders (see, for example Seyhun [1986]). The costs to outsiders from insider trading may have been even larger in the period before these Acts increased the availability of reliable information about covered firms.

To the best of our knowledge, Ferrell [2004] is the only other study of the consequences of the 1964 Amendments. That paper uses a three-factor model and finds little difference between the monthly abnormal excess returns of OTC and listed firms in the period from January 1, 1962, through January 1, 1965. However, there are a number of methodological differences that make it difficult to compare Ferrell's result with this paper's findings in a meaningful manner. Perhaps the most important difference is that Ferrell does not divide the OTC firms into those that had and had not previously registered with the SEC, nor into those above and below the size cutoffs for the 1964 Amendments. In contrast, the division of the OTC firms into the 0-4, 2-4, 0-0, and 2-2 groups is a key feature of our analysis.³³

We now assess whether our results can be applied to other contexts (i.e., their external validity). Recall that the abnormal excess returns are concentrated in the 0-4 group and these firms are not a random sample of firms. Rather, the majority of these firms gave up opportunities for access to new capital through public offerings or the greater liquidity of the NYSE/AMEX to avoid triggering the disclosure requirements. Hence, our estimates should be considered an estimate of the "treatment on the untreated" (see Angrist [1998], Heckman [2001], and Rubin [1977]).

The treatment on the untreated effect could be larger or smaller than the "average treatment effect," which is the mean effect of the imposition of disclosure requirements on all firms. On the one hand, the treatment on the untreated effect might overstate the marketwide benefits of disclosure, because the firms that chose disclosure voluntarily before 1964 (e.g., by listing on the NYSE/AMEX or making a public offering and thereby subjecting themselves to the 1933 and 1934 Acts) are likely to be ones

33. Ferrell [2004] reports that his sample is drawn from the Primary and Eastern tables in the OTC section of *Barron's*. In contrast, our sample also includes firms from the Supplemental table. In our sample, roughly 75 percent of the Primary and Eastern firms had registered with the SEC prior to the passage of the 1964 Amendments so we suspect that Ferrell's sample is primarily comprised of 2-2 and 2-4 firms. Recall, Table IV fails to find a significant difference between the returns of the 2-2 and 2-4 groups and their matched 4-4 groups. Other differences between the studies' examination of stock returns include the papers divide the periods in different ways; Ferrell [2004] appears to not assign exit returns to firms that drop out of *Barron's* or to follow the ones that move to the NYSE/AMEX; Ferrell's comparison group of exchange firms is not size or book-to-market matched; and our collection of the exact filing dates allows us to implement the event study tests of whether market participants valued the disclosure requirements.

where insiders saw relatively little opportunity for diversion and therefore had little to lose if they disclosed. On the other hand, if insiders also hold a large amount of stock in their own companies, the ones who chose disclosure voluntarily might be precisely the ones whose companies' market capitalization would benefit the most from mandatory disclosure. In this case, the 0–4 firms' returns to disclosure would be lower than the average returns to disclosure.

It is also important to highlight that the estimates may not be applicable to settings where disclosure requirements are more stringent than those set forth in the Securities Act of 1933 and Securities and Exchange Act of 1934. For example, the results are unlikely to be directly informative about the consequences of the recent Sarbanes-Oxley Act in the United States. However, our findings are likely to be informative about the consequences of introducing mandatory disclosure regulations in the numerous developed and developing country equity markets where disclosure requirements are more lax than those specified in the U. S. legislation that is now more than 70 years old.

VIII. CONCLUSION

We analyze the last major imposition of mandatory disclosure requirements in U. S. equity markets. The 1964 Securities Acts Amendments extended several disclosure requirements to large firms traded over-the-counter (OTC) that had applied to listed firms since 1934. We find four pieces of evidence that investors valued these disclosure requirements. First, a firm-level event study reveals that OTC firms most impacted by the 1964 Amendments had abnormal excess returns of about 3.5 percent in the weeks immediately surrounding the announcement that they had begun to comply with the new requirements. Second, OTC firms that were most affected by the 1964 Amendments had higher stock returns than those that were less affected in the period between when the legislation was initially proposed and when it went into force. Third, estimates from a series of specifications indicate that the most affected OTC firms had abnormal excess returns ranging between 11.5 and 22.1 percent in the same period, relative to unaffected listed firms and after adjustment for the standard four-factor model. This implies that the 1964 Amendments created \$3.2 to \$6.2 billion (2005 \$'s) of value for shareholders of the OTC firms in our sample. Fourth, the most

affected OTC firms had greater income and sales growth from 1962 to 1966 than unaffected listed firms.

These results are consistent with the hypothesis that mandatory disclosure laws can cause managers to focus more narrowly on the maximization of shareholder value. However, the precise welfare consequences are unknown, because we cannot determine how much of shareholders' gains were a transfer from the insiders of these same companies. If the widely held view that diversion is inefficient and involves welfare losses is correct, then these results should cause policy-makers to question the basis of recent calls to repeal U. S. federal mandatory disclosure requirements. Further, they may provide the basis for reforms in equity markets where the forms of disclosure studied here are not mandatory.

DATA APPENDIX

This data appendix describes the construction of the data set on OTC companies and their stock returns from 1963–1966. It provides details on our quality assurance procedures, sample selection rules, procedures for firms that exit the sample, determination of dividends and stock splits, rules for assigning OTC firms to the different OTC groups, determination of which years (if any) the OTC firms filed with the SEC, methods to collect accounting information for OTC and NYSE/AMEX firms, and construction of the 4–4 groups. Our qualitative findings are unchanged by reasonable variations on the data quality rules described here.

A. *Quality Assurance of Barron's Price Data*

Data entered from *Barron's* were hand checked and (if necessary) corrected by research assistants in the United States in any case where the bid price exceeded the ask price, a bid or ask price was not quoted in eighths, or the percentage difference between the bid and ask price was large.

To avoid spurious exits from *Barron's* and incorrect matches of firms across weeks, we used computer algorithms to compare and match firm name strings (as entered from *Barron's*) across weeks and flag cases where hand checking was needed due to complicated abbreviation changes. We also looked for large changes in the bid and ask prices between *Barron's* issues. Research assistants in the United States investigated the roughly

500 largest weekly changes in split-adjusted prices. These investigations included rechecking the *Barron's* entries and the stock split information. Any documented data entry or matching errors were corrected. Otherwise, the observation was left unchanged.

B. Sample Selection

Firms dropped:

The *Barron's* issue for the first week of 1963 lists 1752 firms. Overall, our sample selection criterion reduces the number of OTC firms used to 1196. The list below outlines the reasons for dropping firms and how many firms are dropped due to each criterion. The criteria were applied in the sequential order that follows.

- (a) (37 firms) We drop preferred stocks and B stocks because these may be differentially affected by the 1964 Amendments.
- (b) (69 firms) Firms with no bid or ask price in the first week of 1963 are dropped.
- (c) (317 firms) We drop banks and insurance companies because they are regulated by multiple agencies and because the 1933 and 1934 Acts, and 1964 Amendments, all treated one or both of these industries differently from other firms. We classify a firm as a bank or an insurance company if it appears in *Barron's* in the separate sections for banks or for insurance companies, or if it appears in *Barron's* general lists but is assigned an SIC code 60 (Depository Institutions), 61 (Non-depository Credit Institutions), 63 (Insurance Carriers), or 64 (Insurance Agents, Brokers, and Service). For firms that file with the SEC in any year between 1962 and 1967, we obtain SIC codes from the *SEC Directory*. For firms not in any of these SEC publications, we assign SIC codes based on reading firm descriptions in the 1963 *Moody's Manuals*.
- (d) (5 firms) A handful of firms had names that were too similar to allow unique matching across weeks or had information for A and B stocks that seemed mixed up across weeks making it difficult to construct a consistent time series.
- (e) (5 firms) For five firms, the *S&P Annual Dividend Record* had incomplete or incomprehensible information about

dividends or splits in one or more years. These firms are dropped.

- (f) (4 firms) A few firms that were acquired in 1962, but which still had prices listed in *Barron's* in 1963, were dropped.
- (g) (52 firms) We drop firms that appear in neither the 1962 *S&P Annual Dividend Record* nor the 1963 *Moody's Manuals* (these *Moody's Manuals* generally refer to fiscal years ending in 1962). There is a risk that such firms do not publicly disclose earnings and dividends with resulting biases in returns calculated without this information.
- (h) (67 firms) We drop firms that have a price less than \$2 in the first *Barron's* issue of 1963. Such firms have a much lower probability of still appearing in *Barron's* by the end of 1966. Dropping these firms from the sample makes our results less sensitive to the exact approach used for dealing with firms that exit *Barron's*.

Of the OTC firm drop criteria, (b) (no price in week 1 of 1963), (c) (banks and insurance companies), and (h) (initial price < \$2) are also relevant for NYSE/AMEX firms and are applied to these firms as well. Criterion (a) (preferred and B stocks) is not relevant for NYSE/AMEX firms, because preferred stock are not covered in CRSP and there is no reason to expect different returns for the 24 NYSE/AMEX B stocks than NYSE/AMEX A or common stocks given the lack of corporate governance reforms for NYSE/AMEX firms in the 1963–1966 period.

Observations dropped:

We implement the following rules to limit the potential influence of data entry or data processing errors. Rules (a) and (b) address possible typos in a bid or ask price. Rule (c) addresses cases where *Barron's* or we may have entered the bid and ask price for an incorrect firm for a particular week. Rule (d) addresses extreme returns, while rule (e) addresses cases where a firm is missing from *Barron's* for a series of weeks but then reappears in the *Barron's* listings.

- (a) Bid price > Ask price: observations where the bid price listed in *Barron's* is larger than the ask price are dropped because such cases likely result from typos by *Barron's* or in our data entry. Observations where *Barron's* lists only a bid or an ask price are dropped because the average of

the bid and ask (used for the calculation of returns) cannot be calculated.

- (b) Bid or ask outlier: to further address likely typographical errors in the data, we drop observations where the bid price is deemed to be an outlier (typo), but the ask price is not, and conversely. We classify the bid price to be an outlier if the absolute value of the one-week capital gain calculated based on the bid price exceeds 50 percent while the two-week capital gain calculated based on the bid price is below 10 percent (the same classification is used for ask prices).
- (c) Bid and ask outlier: to address the possibility that we or *Barron's* entered the wrong line of information for a particular firm in a particular week, we drop return observations where the one-week return exceeds 50 percent in absolute value while the two-week return is below 10 percent.
- (d) Extreme returns: we drop observations with weekly returns above 200 percent under the presumption that most of these result from typos not caught by our above drop criteria.
- (e) In cases where a firm is missing from *Barron's* (or is in *Barron's* but with missing price quotes) over a number of weeks and then reappears, we do not calculate a return for the week of the reappearance. This is done because firms may be more likely to reappear after good returns or after bad returns. Returns prior to the reappearance and for the week of the reappearance are set to missing. In cases where the firm only reappears after the following calendar year, we do not use any of the data after the reappearance because firms that are not covered for a long period of time but then reappear may be systematically different from those that do not reappear.

For comparability, we apply rules (c) and (d) to the NYSE/AMEX data as well. Bid/ask spreads are not available for listed firms, so we cannot apply rules (a)–(b) for those firms.

C. Procedures for Firms That Exit *Barron's*

Appendix 1 summarizes our treatment of firms that exit *Barron's*, change names, or are involved in mergers. In cases of firms that move to the NYSE/AMEX, change names, or are in-

volved in mergers, we continue the time series of returns whenever possible. In cases of liquidations, exits from *Barron's* for no apparent reason, or prolonged periods of missing information in *Barron's*, we assign an exit return in much the same way that CRSP assigns delisting returns to firms that exit their NYSE/AMEX data set. The objective of continuing series where feasible and calculating exit returns otherwise is to correct for any bias in returns that may otherwise result if firms have above or below average returns in the week they exit *Barron's*.

The exit return is assigned to the first week where postexit information is available, and we assign zero returns in the weeks between the last *Barron's* price and the exit return. For comparability we use the same timing convention and assignment of zero returns when assigning delisting returns in CRSP for NYSE/AMEX firms.

To prevent long strings of zero returns, which could bias our estimates of factor loadings in the regressions, we do not use exit information when such information is only available for weeks more than twenty weeks past the exit. This also insures that results are not affected by censoring in the sense that information many months out may only be available for a nonrepresentative set of the firms that exit the sample. For all weeks subsequent to the exit return, we assign a missing return. This is equivalent to assuming that the missing firms' returns for these subsequent weeks are equal to the mean return of the remaining firms in their respective OTC group (i.e., 0-4, 2-4, 0-0, and 2-2).

More specific information on our approach in six types of situations follows. The letters below correspond to groups in Appendix 1.

- (a) Firms that exit *Barron's* and moved to the NYSE or AMEX: we use the CRSP NYSE/AMEX files to determine which of the firms that stop being listed in *Barron's* Over-the-Counter section do so because they have moved to the NYSE or AMEX. The return for the week the firm first appears in CRSP is calculated using the first CRSP price and the last *Barron's* price, and information on dividends and stock splits from *S&P Annual Dividend Record*. In over 94 percent of the cases the firm appears in CRSP in the first week after exiting from *Barron's*. In a few cases there is a one-, two-, or three-week gap between the *Barron's*

exit and the first appearance in CRSP. The return for this week is set to zero. In a few other cases, *Barron's* lists prices for a few weeks following the appearance in CRSP. We use the CRSP prices to calculate returns for these weeks. In weeks following the first week of the CRSP appearance, we calculate weekly returns based on CRSP's information on prices, dividends, and stock splits. For simplicity, we calculate weekly returns in CRSP based on the daily returns provided (this allows for an intraweek return on any dividends paid, but we confirmed that any resulting bias from this is minuscule by alternatively calculating returns using the prices, dividends, and splits directly).

- (b) Firms that change names: name changes are identified using the *Moody's Manuals*, *NSS*, and *Directory of Obsolete Securities*. When *Barron's* continues coverage of the firm under the new name, we are able to continue the time series of returns for the firm. When the new firm name does not appear in *Barron's*, we assign, when possible, an exit return based on the first postexit price found in the *NSS* and dividend and stock split information from *S&P Annual Dividend Record*. The exit return is assigned to the week of the *NSS* price. Weeks between the exit from *Barron's* and the *NSS* price are assigned a return of zero.
- (c) Firms involved in mergers: mergers and merger terms are identified using the *Moody's Manuals*, *NSS*, and *Directory of Obsolete Securities*. When the acquiring company is in *Barron's* or on the NYSE/AMEX, we are able to continue the time series of returns for the firm. Otherwise, we assign an exit return whenever possible, based on the first postexit price found in the *NSS* and dividend and stock split information from *S&P Annual Dividend Record*. When merger terms are unavailable, we set the return for the merger week to missing. In cases of acquisitions for cash, we assign an exit return and do not continue the time series.
- (d) Firms that are liquidated: liquidations are identified using the *Moody's Manuals*, *Directory of Obsolete Securities*, and *S&P Annual Dividend Record*. When possible we assign an exit return based on either

information about liquidating dividends or the first postexit price found in the *NSS* and dividend and stock split information from *S&P Annual Dividend Record*.

- (e), (f) Firms that exit *Barron's* for no apparent reason or for which we discontinue the return series due to long periods of missing information in *Barron's*: Appendix 1 splits these firms into those that exit with a last price above \$2 and those that exit with a last price of \$2 or less. The latter category is larger, suggesting that *Barron's* tends to drop coverage of firms with very low prices. When possible, we use the *NSS* and *S&P Annual Dividend Record* to assign an exit return.

Appendix 1 summarizes the causes of attrition from *Barron's* and provides counts of the securities for which the time series could be continued. We succeeded in assigning an exit return for 78 percent of the securities where it was impossible to continue the time series. The largest single source of attrition from *Barron's* OTC listings is movement to NYSE or AMEX. Over the course of the four years, 23 percent of the OTC sample firms move to the NYSE or the AMEX.

To evaluate the importance of these efforts to follow the stock prices of firms that exit *Barron's*, we repeated our estimations without assigning exit returns or continuing series using information about moves to NYSE/AMEX, name changes, and mergers. The $\alpha_{0-4}^{Pd 1}$ estimate from the column (5) specification of Table IV is 0.135 with a standard error of 0.045 if exit returns are not assigned, compared with the estimate of 0.097 with a standard error of 0.046 in Table IV from the primary data file that includes exit returns. It is evident that the paper's estimates of the effect of the 1964 Amendments would be overstated if we had not collected exit returns.

D. Dividend Data

Our primary source for dividends and stock splits was the *S&P Annual Dividend Record*. This publication aims to be a "record of dividend payments on virtually every American and Canadian preferred and common stock." The average number of firms covered in this publication during the 1962–1966 period was around 10,000. There were roughly 2000 firms on the

American and New York Stock Exchanges in these years, so approximately 80 percent of the entries were for OTC (and Canadian) firms. Approximately 85 percent of our 1196 OTC firms were in the 1962 S&P book. We entered the amounts and dates of every cash, property, and liquidating dividend and stock split for each of the OTC firms in the sample. When necessary, we used the *NSS* and the *Directory of Obsolete Securities* to verify dividends.

As mentioned above, we dropped 52 firms that appeared in *Barron's*, but failed to appear in either the 1962 *S&P Annual Dividend Record* or the 1963 *Moody's Manuals*. There is a risk that such firms do not publicly disclose earnings and dividends. For the vast majority of remaining firms not in the 1962 S&P book, we were able to use the *Moody's Manuals* to verify that no dividends or splits had taken place in 1962 or confirm that the firms were included in the 1963 S&P book that covers the dividends for the first year of our analysis.

E. Assignment to OTC Groups

We assigned each OTC firm to one of four OTC groups based on information at the start of 1963. The 0–4 group is comprised of firms that were not filing annual reports with the SEC and exceeded the size and asset floors set forth in the 1964 Amendments. We assume that firms with assets exceeding \$1 million and more than 500 shareholders and firms with assets exceeding \$5 million but missing shareholder data qualify as exceeding the size and assets floors. The 2–4 group includes firms that were filing periodic reports with the SEC and exceeded the size and asset floors described in the previous sentence. The 2–2 group is comprised of firms that fail to exceed the size and asset floor rules and were filing periodic reports. The 0–0 firms also fail to exceed the size and asset floor rules and were not filing periodic reports with the SEC.

The asset and stockholder characteristics as of the start of 1963 are obtained from the 1962 and 1963 *Moody's Manuals*. We ascertained the identity of firms that filed with the SEC from the 1963 edition of the *SEC Directory*. This publication lists the firms that file with the SEC in the year ending in July 1963. Because we are interested in filing status as of the start of 1963, we classify firms that appear in the 1963 *SEC Directory* but (a) went to NYSE/AMEX in the first half of 1963 and (b) did not file with

the SEC according to the 1962 *SEC Directory* as initial nonfilers (i.e., as 0–4 or 0–0 firms).

F. Determination of Compliance with Mandatory Disclosure Requirements

The *SEC Directory* reports the identities of each company that complies with mandated disclosure requirements. Each company's filing status was collected annually for our sample of OTC firms. The *U. S. SEC News Digest* lists the exact date that the SEC considered the complying firms in our sample to have fulfilled the registration requirement in the case of the 0–4 firms and initiated the filing of proxy and insider trading reports in the case of the 2–4 firms. We use these exact dates to implement a firm-level event study analysis of the consequences of the initial compliance with these disclosure requirements.

G. Accounting Data

We gathered accounting information for firms in our OTC sample from the annual *Moody's Manuals*. The COMPUSTAT electronic files are the primary source for accounting and industry data for NYSE/AMEX firms. For NYSE/AMEX firms not covered in COMPUSTAT, we collected this information from the *Moody's Manuals* supplemented with book equity information available from Kenneth French's web page and used in Davis, Fama, and French [2000].

H. Construction of 4–4 Groups

We construct separate 4–4 comparison groups for each of the four OTC groups. These 4–4 groups are constructed so that distributions of the underlying firms' market capitalizations and book value of equity to market value of equity are similar to these distributions in the corresponding OTC group. The two 4–4 groups that correspond to the 0–4 and 2–4 groups are constructed in the following four steps.

1. The NYSE/AMEX firms present in CRSP at the beginning of 1963 are divided into five market capitalization quintiles and five quintiles of book value of equity to market capitalization, thus creating 25 cells (portfolios) of firms. To be comparable to our approach to constructing the OTC groups, these 25 cells are never refreshed to include new

entrants to CRSP or changes in existing firms' market capitalization or book value of equity to market capitalization. Consequently, the numbers of firms in each cell will decline over time as firms go bankrupt, merge, or disappear from CRSP for other reasons.

2. We calculate the weekly unweighted average returns for each of the 25 cells. We then determine which of the 25 cells of the NYSE/AMEX firms each OTC firm would belong to in the first week of 1963 if it were trading on the NYSE or AMEX. The firm is then matched to that cell throughout the analysis.
3. The weekly portfolio returns of each OTC group's matched 4-4 group in a given week are calculated as the weighted average of the 25 NYSE/AMEX cell index returns. Each cell's weight is equal to the fraction of the OTC group's firms with a nonmissing return in the relevant week that are matched to that cell.

If the 0-4 and 2-4 groups of OTC firms had been traded on the NYSE/AMEX, their mean (median) market capitalization quintiles would have been 1.95 (2) and 2.14 (2), respectively. Their mean (median) book to market quintiles would have been 3.14 (3) and 2.69 (3), respectively. Quintile 1 is comprised of the firms with the smallest values of market capitalization and book to market, respectively. The market capitalization is missing for seven of the 0-4 and 2-4 firms while 21 of these firms have missing book-to-market equity ratios. In cases of missing market capitalization we assume a market capitalization equal to the firm's assets multiplied by the median market capitalization to asset ratio of firms in their group, while in cases of missing book-to-market values we assign the median book-to-market ratio of firms in their group.

We use the return on the smallest NYSE/AMEX size quintile portfolio as a size-matched 4-4 group for the 0-0 and 2-2 groups. For these groups, we are unable to conduct detailed matching on size and book-to-market equity, because such information is unavailable for many OTC firms in these groups. We use the smallest size NYSE/AMEX quintile as the comparison group because, as Table II demonstrated they are much smaller than the 0-4 and 2-4 firms in terms of assets and sales.

APPENDIX 1: TREATMENT OF FIRM CHANGES FOR OTC FIRMS

	Jan 63	Jan 64	Jan 65	Jan 66	Dec 66
Sample size	1196	1129	1053	986	941
(a) Move to NYSE/AMEX	87	83	65	39	
Continued	87	83	65	39	
(b) Name change	9	15	10	7	
Continued	6	10	6	6	
Not continued (ER assigned/not assigned)	3 (1/2)	5 (3/2)	4 (3/1)	1 (0/1)	
(c) Merger	30	38	36	25	
Continued (merger week return ass./not ass.)	23 (20/3)	28 (20/8)	24 (19/5)	18 (16/2)	
Not continued (merger week return ass./not ass.)	7 (4/3)	10 (8/2)	12 (9/3)	7 (6/1)	
(d) Liquidations	5	5	5	5	
Not continued (ER assigned/not assigned)	5 (3/2)	5 (1/4)	5 (3/2)	5 (3/2)	
(e) Exit from <i>Barron's</i> , last price > \$2	29	14	14	13	
Not continued (ER assigned/not assigned)	29 (28/1)	14 (13/1)	14 (10/4)	13 (12/1)	
(f) Exit from <i>Barron's</i> , last price ≤ \$2	39	22	16	17	
Not continued (ER assigned/not assigned)	39 (31/8)	22 (19/3)	16 (13/3)	17 (11/6)	
Total exits/changes	198	177	138	106	
Total series continued	116	121	95	63	

“ER” stands for “exit return.” Among the firms with discontinued time series of returns, “ER assigned”/“not assigned” refers to firms for which it was possible/impossible to assign exit returns within 20 weeks of the last *Barron's* price. Overall, we succeeded in assigning an exit return for 78 percent of the 233 firms where the time series of returns was not continued. The number of observations at the beginning of the following year does not exactly equal the number of observations at the beginning of the current year, minus the number of exits/changes, plus the number of series that are continued. This is because an exit return may only be assigned in the following calendar year. Furthermore, series that are continued may again be subject to one of the changes in (a)–(f). Such changes are not included in the above counts.

APPENDIX 2: FACTOR LOADINGS BY GROUP AND PERIOD

	Pd 1	Pd 2	Pd 1	Pd 2	Pd 1	Pd 2	Pd 1	Pd 2
	OTC groups							
	0-4		2-4		0-0		2-2	
Market factor beta	0.701 (0.056)	0.866 (0.061)	0.750 (0.057)	0.837 (0.057)	0.588 (0.106)	0.815 (0.147)	0.720 (0.131)	0.783 (0.109)
Size factor beta	0.651 (0.117)	0.904 (0.133)	0.725 (0.117)	0.892 (0.095)	0.868 (0.186)	1.209 (0.259)	0.977 (0.204)	1.294 (0.193)
Book/market factor beta	0.014 (0.085)	0.236 (0.059)	0.070 (0.081)	0.282 (0.700)	0.037 (0.146)	0.345 (0.282)	0.205 (0.177)	0.565 (0.321)
Momentum factor beta	0.054 (0.074)	-0.248 (0.084)	-0.011 (0.085)	-0.170 (0.060)	0.159 (0.139)	-0.187 (0.198)	-0.200 (0.175)	-0.028 (0.170)
R^2	0.639	0.912	0.667	0.938	0.326	0.634	0.296	0.748
	NYSE/AMEX comparison groups							
	For 0-4		For 2-4		For 0-0 and 2-2			
Market factor beta	0.840 (0.039)	0.982 (0.038)	0.868 (0.037)	0.992 (0.038)	0.747 (0.070)	0.944 (0.062)		
Size factor beta	0.969 (0.062)	1.087 (0.079)	0.985 (0.061)	1.089 (0.082)	1.039 (0.107)	1.357 (0.141)		
Book/market factor beta	0.250 (0.062)	0.268 (0.060)	0.214 (0.063)	0.245 (0.058)	0.245 (0.104)	0.341 (0.095)		
Momentum factor beta	-0.104 (0.070)	-0.067 (0.053)	-0.115 (0.068)	-0.063 (0.052)	-0.208 (0.126)	-0.123 (0.098)		
R^2	0.875	0.974	0.886	0.974	0.680	0.925		

The entries are the factor loadings (betas) on the four factors in the estimation of equation (2). Heteroskedastic-consistent standard errors are in parentheses.

DEPARTMENT OF ECONOMICS, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, AND
 NATIONAL BUREAU OF ECONOMIC RESEARCH
 GRADUATE SCHOOL OF BUSINESS, STANFORD UNIVERSITY, AND NATIONAL BUREAU OF
 ECONOMIC RESEARCH
 KELLOGG SCHOOL OF MANAGEMENT, NORTHWESTERN UNIVERSITY, AND NATIONAL
 BUREAU OF ECONOMIC RESEARCH

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