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Why Do Firms Go Dark?

András Marosi and Nadia Massoud*

Abstract

In recent years, a number of firms and banks have decided to "go dark," i.e., deregister with the Securities and Exchange Commission and delist from the major exchanges despite having a large number of outside shareholders. This paper seeks to answer two important questions: Why do firms choose to go dark? What are the consequences for shareholders? We find that firms with fewer valuable growth opportunities, greater insider ownership, lower institutional ownership, higher leverage, and lower market momentum are more likely to go dark. Furthermore, the cost of regulatory compliance is a driving force behind the going dark phenomenon.

I. Introduction

In recent years, there has been an increase in the number of Securities and Exchange Commission (SEC) registered and publicly traded firms that "go dark," i.e., deregister from the SEC despite having a large number of outside shareholders. A number of institutional investors have voiced their concerns about this trend in the business press. (See "A Legal Way to Keep Investors in the Dark" and "When Companies 'Go Dark,' Investors Can Lose" in the August 4, 2003 and May 24, 2004 issues of *Business Week*, respectively.) Indeed, 406 firms went dark between January 1, 1996 and May 31, 2004.

Unlike the wave of going private transactions in the 1980s when the mechanism was often a leveraged buyout (LBO) by managers and private equity investors—see Jin and Wang (2002)—firms that go dark exploit Section 12g(5) of the Securities Exchange Act of 1934 as amended in 1964. Under the 1964 amendment, a firm with total assets of at least $10 million must continue to be registered

*Marosi, amarosi@ualberta.ca, and Massoud, nmassoud@ualberta.ca, Department of Finance and Management Science, University of Alberta, Edmonton, AB, T6G 2R6, Canada. We thank Lawrence Booth, Eugene Kandel, Vikas Mehrotra, Randall Morck, Andrey Pavlov, Barry Scholnick, Sheridan Titman, and an anonymous referee as well as seminar participants at Hebrew University, Simon Fraser University, the University of Alberta, the University of Texas at Austin, the 2004 Northern Finance Association meetings, the 2005 First CGA Manitoba Finance and the Boundaries of SEC Regulation conference for their comments and suggestions. We also thank Pink Sheets LLC for making data on over-the-counter trading available. We acknowledge financial support from the National Research Program on Financial Services and Public Policy at York University. Massoud acknowledges financial support from the Social Sciences and Humanities Research Council of Canada and University of Alberta Fellowships. Guo Hou, Wael Montasser, Federica Pazzaglia, Rahul Ravi, Gloria Tian, Saif Ullah, and Sherry Wang provided excellent research assistance.

under the Securities Exchange Act if it has at least 300 shareholders of record (the threshold is 500 shareholders of record for firms with less than $10 million in assets).[1]

Despite this amendment, companies that have recently "gone dark" include United Road Services with over 6,000 beneficial shareholders and $97 million in total assets and ACAP Corporation with over 500 beneficial shareholders and $146 million in total assets.[2]

Given that the number of beneficial shareholders and total assets of these companies appears to exceed the regulatory minimum for public registration, how have they been able to go dark? Why do they choose to go dark (deregister with the SEC but remain publicly traded over-the-counter (OTC) on the Pink Sheets)? Moreover, what are the consequences for shareholders? The main objective of this paper is to address the above questions, especially in light of the concerns raised about this trend by institutional investors.

We find that firms with fewer valuable growth opportunities, greater insider ownership, lower institutional ownership, higher leverage, and lower market momentum are more likely to go dark. Further, the direct costs of regulatory compliance—as reflected in higher audit fees—also appear to be a major driving force behind the going dark phenomenon. In addition, our results comparing pre- and post-Sarbanes-Oxley deregistration decisions show that firms are more likely to go dark in the post-Sarbanes-Oxley period and that the impact of audit fees on the probability of going dark has increased. We find also that investors suffer significant negative cumulative abnormal returns upon the announcement of deregistration and, post-going dark, are left holding significantly less liquid shares. Our paper makes a number of other contributions, including an examination of the incentives created by information asymmetries and conflicts of interest between inside and outside shareholders, an analysis of the effects of regulated financial institutions (e.g., banks) going dark on their shareholders, as well as an analysis of post-deregistration stock price performance and liquidity effects.

As will be discussed in more detail, the major mechanism for going dark is an outgrowth of the rapid dematerialization of shares as part of the SEC's effort to increase the efficiency of U.S. stock trading, brokerage, and clearing. One of the outcomes of this dematerialization trend is that fewer and fewer shareholders are holding paper share certificates. Instead, they hold their claims in electronic form with street names such as Merrill Lynch and other brokerage firms. As a result, the number of shareholders listed in corporate records as having been issued a paper stock certificate has shrunk.

This is important because it is the number of shareholders of record, rather than the number of beneficial shareholders, that is used by the SEC to determine whether the number of shareholders is below 300 (or 500 for firms with assets less than $10 million). For example, Merrill Lynch as the holder of the claims

[1] Initial registration under the Exchange Act is triggered when the size of a company exceeds $10 million as measured by total assets and the number of holders of a class of its equity securities reaches 500.

[2] For further details of these firms, see Nelson, "Petition for Commission Action to Require Exchange Act Registration of Over-the-Counter Equity Securities," July 2003, a petition filed with the SEC for an amendment to Section 12g(5) of the Securities Exchange Act (http://www.sec.gov/rules/petitions/petn4-483.htm).

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of many thousands of small investors would be counted as one certificate holder toward meeting the 300 (500) shareholder threshold.

With respect to prior research, Bushee and Leuz (2004) look at firms' registration decisions relating to the 1999 SEC "eligibility rule" requiring firms trading on the Over-the-Counter Bulletin Board (OTCBB) to choose whether to register with the SEC or not. If they choose not to register, they have to leave the OTCBB for the Pink Sheets. They find significant negative abnormal returns upon removal from the OTCBB. Importantly, they did not examine the decision by firms to deregister and go dark as public firms, which is the focus of this paper. Engel, Hayes, and Wang (2007) use event study analysis to look at the stock return effects for firms that choose to go private following the passage of the Sarbanes-Oxley Act. They find that firms going private following the passage of the Sarbanes-Oxley Act in 2002 were smaller firms with greater inside ownership who experienced large positive abnormal returns. However, decisions to go dark can have a very different effect on firm returns compared to going private decisions.[3]

Section II of our paper discusses potential mechanisms and motivations for firms going dark as well as descriptive statistics regarding their importance. Section III investigates reasons why firms go dark first using matched and then unmatched logit analysis as a robustness check.[4] Section IV examines the adverse and differential impact on shareholders of deregistration announcements by firms and banks. Section V examines trading after going dark, in particular, the impact of deregistration on the price and liquidity behavior of going dark stocks as well as on their post-deregistration stock price performance. Section VI concludes and discusses the overall public policy implications of the going dark phenomenon in light of our results, including a possible amendment to SEC Rule 12g(5).

II. Going Dark

A. The Mechanism of Going Dark

Unlike the wave of LBOs in the 1980s and 1990s, which involved raising large amounts of debt to buy out existing stockholders, going dark is very different in its mechanism and leverage implications. A typical example would be a hi-tech firm that went public during the 1999–2000 boom and was listed on NASDAQ. For reasons discussed in Section II.B, it decides to go dark. This involves a two-step process for a company listed on the NYSE, AMEX, or NASDAQ. The first step is to delist from the exchange, which may take up to 21 days. The delisting announcement may also report the reason why the firm is delisting, for example,

[3] In a concurrent paper, Leuz, Triantis, and Wang (2007) look at the impact of agency and corporate governance related factors on the deregistration decision using an unmatched sample. However, they do not examine the effect of the costs of regulatory compliance (such as audit fees), insider ownership, and the probability of deregistration for financial versus non-financial firms.

[4] A priori we believe the matched approach has many advantages over the unmatched approach. For example, the unmatched sample is unbalanced having a greater proportion of firms that trade on major exchanges rather than OTC and a smaller number of financial institutions than the going dark sample. These differences are statistically significant.

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whether it is delisting because it plans to deregister with the SEC. Once delisted, the firm trades (if at all) on the OTCBB[5] or on the Pink Sheets.[6]

The firm may then file a Form 15 with the SEC requesting its deregistration. A full shareholder vote is not required: a firm with fewer than 300 (500) shareholders of record only needs the approval of its board of directors to deregister with the SEC. In general, the deregistration takes up to 90 days to approve. On applying for deregistration, the firm no longer has to file public information with the SEC as to its financial condition. That is, from an outside investor's perspective the firm has effectively gone dark.

It is important to distinguish the *voluntary* decision to go dark from being *involuntarily* delisted by an exchange as a result of a firm's inability to comply with one or more of the exchange's listing requirements—see Macey, O'Hara, and Pompilio (2004) and Panchapagesan and Werner (2004). It is also important to distinguish the going dark decision from going private. In going private, a firm's insiders commonly repurchase existing shares from a firm's outsiders—often at a premium over current share prices—see, for example, Engel, Hayes, and Wang (2007) and DeAngelo, DeAngelo, and Rice (1984). Firms that go dark do not make tender offers to buy out all their shareholders. Instead, they may exploit mechanisms—such as reverse stock splits and limited tender offers—to reduce the number of holders of record below the 300 (500) threshold. For example, on March 8, 2004 Keller Manufacturing Company Inc. announced that it plans to implement a 1-for-500 reverse stock split[7] in order to go dark.[8] While some investors are bought out in going dark transactions, surviving outside shareholders are left holding shares that are eligible for trading only on the Pink Sheets.

B. Reasons for Going Dark

There appear to be two major reasons why firms choose to go dark. The first is related to the direct and indirect costs of regulatory compliance, especially following the passage of the Sarbanes-Oxley Act on July 31, 2002. The second

[5]In order to be eligible to trade on the OTCBB, firms must remain current in their filings with the SEC or applicable regulatory authority. Also note that while the issuer pays for listing on a major exchange, it is the market maker who has to pay for quoting a company's shares for OTC trading. Most trading rules that are enforced on major exchanges, such as the NYSE's uptick rule, do not apply in the OTC markets.

[6]The Pink Sheets is essentially a quotation service for subscribing market makers offering to trade in OTC issues, not an issuer listing service or an exchange. Currently, there are approximately 3,900 issues quoted on the Pink Sheets. While broker-dealers trading on the Pink Sheets are regulated by the National Association of Securities Dealers (NASD), companies quoted in the Pink Sheets are not required to be registered with the SEC. With the exception of financial institutions and firms traded on foreign stock exchanges, Pink Sheets traded firms are not subject to regulatory oversight. Also, Pink Sheets LLC (the owner of the Pink Sheets market) is considered neither a broker-dealer nor an exchange under current SEC rules, and it is not regulated by the SEC.

[7]Investors holding fewer than 500 pre-reverse split common shares are cashed out (i.e., no fractional shares are issued). In order to ensure a significant reduction in the number of holders of record, going dark transactions usually involve sizable split ratios.

[8]Depending on the state of incorporation and its articles of incorporation and bylaws, a company's board of directors may be able to declare a reverse stock split without a vote by shareholders. The board of Keller Manufacturing, under Indiana law, was not required to seek shareholder approval. Smaller firms, which seem to be the primary candidates for going dark, tend to have high insider ownership, implying that a reverse stock split may be a feasible strategy even when a shareholder vote is required.

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relates to a variety of economic incentives, particularly the self-interest of inside shareholders.

1. Regulatory Incentives for Going Dark

Compliance with SEC reporting and governance requirements imposes a number of indirect and direct costs on publicly registered firms. Indirect costs primarily relate to the responsibility of corporate executives and boards in producing and verifying publicly available information. The direct costs relate most commonly to audit fees paid by firms. After the passage of Sarbanes-Oxley, the responsibilities of corporate executives and auditor roles have been enhanced immensely.[9] For example, auditors can no longer provide consulting or other ancillary services to the same firm. This provision is largely in response to the collapse of Enron and the perceived failure of Arthur Andersen to detect fraudulent activities due to the conflict of interest inherent in its dual role as both auditor and consultant. Such a separation of activities may reduce conflicts of interest, but it also reduces the potential for cross-subsidization of audit fees by accounting firms in search of additional business such as consulting. In a recent paper, Eldridge and Kealey (2005) find that the average increase in audit fees from 2003 to 2004 was 67% among Fortune 1000 companies, and that larger companies benefited from returns-to-scale (implying an above average cost increase for smaller firms).

Nevertheless, while some question the costs of remaining public, others view the passage of the Sarbanes-Oxley Act as being net beneficial for outside investors. For example, a survey conducted by Harris Interactive® (for software maker Movaris) found a majority of investors are looking for good corporate governance and adherence to the Sarbanes-Oxley Act.

Thus, whether the Sarbanes-Oxley Act negatively impacts shareholders in general or just inside shareholders, given the tradeoff between enhanced corporate governance and higher audit fees, is an empirical question. In particular, outside shareholders may value enhanced governance positively while inside shareholders (such as manager-shareholders) may view enhanced governance negatively. Consequently, the perceived net costs or benefits of Sarbanes-Oxley may be a function of the insider/outsider ownership structure of firms.

2. Economic Incentives for Going Dark

A variety of agency, corporate governance, and other economic reasons for going dark have been raised in the business press. As noted above, insiders and outside shareholders have divergent interests regarding the costs of the enhanced corporate governance requirements under Sarbanes-Oxley. In addition, insiders have both the means and the incentives to exploit any asymmetric information advantages they have. A more detailed discussion of economic incentives and the corresponding variables follows in Section III.A.

[9] See the Web site of the American Institute of Certified Public Accountants for a summary of the enhanced reporting and governance requirements under Sarbanes-Oxley (http://www.aicpa.org).

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C. Data Description and Sources

To understand our sample, it is important to remember the distinction between delisting from an exchange and deregistration with the SEC. All firms listed on one of the major exchanges or traded on the OTCBB are required to be registered with the SEC. A firm that is delisted from an exchange will not necessarily deregister. However, a firm that decides to end its registration with the SEC while trading on a major exchange (or the OTCBB) must delist. Most of these firms then find their shares are moved to the Pink Sheets.

Deregistering firms were first identified by searching the SEC's EDGAR database for firms that filed a Form 15 to deregister all classes of their public securities over the January 1996–May 2004 period.[10] We excluded firms that filed a Form 15 to deregister only their preferred stocks or publicly traded bonds.

The dates of deregistration announcements are determined based on press releases or newswire announcements collected from Form 8 or other SEC filings (proxy statements, etc.), the Factiva database, and firms' Web sites. Firms that filed to deregister as a result of a merger, bankruptcy, or liquidation are dropped from the sample. We also drop foreign firms.[11] After this procedure, our total sample consists of 406 firms.

The logit analysis in Section III requires the availability of both accounting and share price information. Accounting information is from Compustat as well as from EDGAR. Datastream and Pink Sheets are our primary source of stock return and volume data. As a further screening of the deregistering sample (406 firms), we exclude firms that emerged from bankruptcy in the year before going dark, shell corporations, firms for which accounting or stock price data was not available, and firms which were not publicly traded—either on a major exchange or OTC—at the time of the announcement. After such screening, we end up with a total deregistering sample of 261 firms. Table 1 shows the breakdown of the going dark sample in each year between January 1996 and May 2004. As can be seen, the number of firms going dark has grown dramatically over time. The increase is the highest after Sarbanes-Oxley with 101 firms deregistering in 2003 compared to 44 in 2002.

To better understand the type of firms in our going dark sample, we provide a few examples. The five largest deregistering firms are all financial institutions with total assets ranging from $344 million to $9.75 billion. First National of Nebraska, Inc, a commercial bank, is the largest deregistering firm in our sample. The five smallest firms have total assets ranging from $0.138 to $0.502 million and are not concentrated in a particular industry.

[10] Not all SEC filings are available on EDGAR because electronic reporting was phased in over a three-year period ending on May 6, 1996. Since we use EDGAR data extensively in this paper, our sample does not include firms that went dark before 1996.

[11] In general, foreign firms (typically American Depositary Receipts (ADRs)) can only deregister if there are fewer than 300 beneficial owners (rather than holders of record) (for further details see Marosi and Massoud (2007)).

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TABLE 1

Number of Firms That Deregistered (Went Dark) 1996–2004

Table 1 contains the yearly breakdown of firms with available financial reporting (Compustat) and stock price (Datastream) information that went dark between January 1996 and May 2004.

Year	Firms with Financial Data	Firms with Price Data
2004 (May)	37	27
2003	101	104
2002	44	42
2001	22	20
2000	13	11
1999	21	17
1998	13	12
1997	6	2
1996	4	3
Total	261	238

III. Logit Analysis of the Firm's Decision to Go Dark

The question we analyze in this section is what factors prompt a firm's decision to go dark? In the case of the wave of going private transactions in the 1980s, Jensen's (1986) free cash flow hypothesis is often suggested as the most plausible explanation. Moreover, studies by Lehn and Poulsen (1989) and Opler and Titman (1993) tend to support the free cash flow hypothesis. While one might expect to find similar results for firms that went dark, two important differences should be noted. First, besides free cash flow and other agency-related variables, the decision of firms to go dark may also be affected by their costs of regulatory compliance. Second, while going dark may be motivated by some of the same factors as LBOs and management buyouts (MBOs), the final results for outside shareholders differ dramatically. This is because rather than resolving the agency problems of free cash flow, going dark actually exacerbates them.

A. Logit Model and Variables

Our logit tests focus on two samples: a matched sample of firms (Sections III.A and III.B) and an unmatched sample of firms (Section III.C). As discussed in these subsections, our results regarding the importance of various economic and regulatory incentives for going dark are generally robust across both the matched and unmatched samples.

1. Matched Logit Analysis

We first use a matched logit analysis to identify the relative importance of different factors driving the going dark decision. The dependent variable is binary: 0 if the firm did not deregister and 1 if it did. We construct our matched holdout sample in a manner similar to Lehn and Poulsen (1989). In addition to matching firms by industry, we also match by size since, a priori, we expect smaller firms to have a greater incentive to deregister than larger firms. Larger firms may be reluctant to deregister for a number of reasons including the need to retain public visibility so as to attract sufficient external financing in the future. The matching firms are chosen based on three criteria: i) 4-digit SIC code, ii) average asset size over the three years prior to the going dark announcement by the

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sample firm, and iii) the market[12] for the firm's common equity at the end of the last fiscal year prior to deregistration.[13]

On a few occasions when it is difficult to choose between matching firms, we include both firms in the matching sample. In total, we have 282 matching firms and 261 going dark firms for a combined sample of 543 firms. Table 2, Panel 1, provides full details of the construction and source of our dependent and explanatory variables in the logit model.

Our choice of explanatory variables is predicated on our seeking to distinguish economic incentives from regulatory incentives. With respect to economic incentives, the q-ratio measures the firm's potential growth options. Firms with a high q-ratio may prefer to stay public since they are better able to raise additional external financing in capital markets. Alternatively, insiders may wish to take high q-ratio firms dark so as to be better able to expropriate the implied growth options inherent in a high q-ratio. That is, having a higher q-ratio may either increase or decrease a firm's probability of going dark.

Insider ownership stakes—the percentage of voting common equity controlled by managers and directors of the company—may also be expected to influence the going dark decision for both corporate governance cost and cash flow expropriation reasons. The more concentrated is the voting power of insiders the easier it is to ensure sufficient votes to take a firm dark.

According to the extant literature, the larger is a firm's cash flow, the stronger the incentive to take that firm private (Jensen (1986) and Lehn and Poulsen (1989)). However, unlike in the LBO wave of the 1980s, firms that go dark can capture significant amounts of cash flow for insiders. In our tests, we not only analyze the separate effects of cash flow, the q-ratio, and insider ownership stakes, but also the explanatory power of cash flow when it is interacted with each of these variables. Specifically, (low q) firms with limited growth opportunities may have a stronger incentive to go dark if the potential gain from cash flow expropriation by insiders is greater. Therefore, the propensity to go dark may be greater among firms with both low q-ratios and high free cash flows (see, for example, Opler and Titman (1993) and Lang, Stulz, and Walking (1991)). The interaction of cash flow with insider ownership examines the possibility that firms with high free cash flow and high insider ownership have a greater incentive to take the firm dark so as to expropriate the free cash flow.[14]

The ratio of intangible assets to total assets (the intangible asset ratio) is a measure of the degree of asymmetric information between insiders and outsiders regarding the value of the firm's assets. In particular, insiders may be better able to value such assets. Consequently, insiders may seek to utilize their private information advantage by going dark. Firms may be more reluctant to go dark following a period of either strong positive stock price performance (or momen-

[12]We distinguish between two types of equity markets: major organized exchanges (NYSE, AMEX, and NASDAQ) and OTC markets (the OTCBB and the Pink Sheets).

[13]Where possible, we also match by "age," selecting matching firms that became public at approximately the same time as the going dark firm. Also, we find that the stock price levels of going dark and matching firms are not significantly different.

[14]This interaction term is highly correlated with the free cash flow variable ($\rho = 0.767$). To address this issue, we drop the free cash flow variable from the logit model when we introduce the cash flow-insider ownership interaction variable.

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TABLE 2

Variable Index

Financial data were collected from many sources (Compustat and from a firm's filing a 10K with the SEC) depending on its availability. Financial data, the data from filing DEF14 with the SEC (insider ownership), and Audit Fee Analytics for the deregistering firms were collected from the last annual financial report before a firm went dark. For the matching firms, these data were collected from the same fiscal year of the sample firm. Spreads were collected from multiple sources (Datastream, CRSP, and the Pink Sheets) depending on the availability of the data. Prices and volume were collected from Datastream.

Panel 1. Logit Variables

Variables	Description
Binary	Dependent variable takes a value of 1 for firms who chose to go dark and 0 for the matching firms. The deregistered firms were matched based on three criteria: i) Their 4-digit SIC code. ii) Their asset size, 3-year average prior to the sample firms deregistration date. The matched firm's asset value may vary between the maximum and the minimum of the 3-years asset value. iii) Equity market: major exchange or OTC.
q-ratio	This measure was based on Chevalier's (2004) Tobin's Q measure, i.e., the market value of assets divided by the book value of assets. The market value of assets equals the book value of assets plus the market value of common equity less the book value of common equity.
Log of firm assets	The logarithm of the firm's asset value.
Intangible asset ratio	The ratio of the firm's intangible assets to total assets. Intangible assets include: blueprints or building designs, client lists, computer software patent costs, contract rights, costs associated with approved patents, copyrights, and design costs.
Leverage	Leverage is calculated as the ratio of total liabilities to total assets and alternatively the ratio of long-term debt over assets.
Financial institution (FI) dummy	Is 1 for firms from the financial sector (SIC codes 6020 to 6500) and 0 otherwise.
Insider ownership	The ratio of holdings of common (voting) shares by all directors and officers as a group to total outstanding (voting) shares. The insider ownership ratio was hand collected from either proxy statements (form DEF14A) or Form 10K on the SEC's EDGAR database.
Audit fees to MVE	The dollar value of the annual audit fees paid by a firm for certifying its financial reports divided by the firm's market value of equity (MVE). The annual audit fees were obtained from the Audit Analytics database. It is usually reported by the firm in the proxy statement (form DEF14A) on the SEC's EDGAR database.
Free cash flow[a]	This measure is based on the Opler and Titman (1993) measure of free cash flow, i.e., a firm's cash flow is measured as operating income before taxes, interest, and depreciation (EBITDA). It is expressed as a ratio of the market value of assets. The market value of assets is equal to the risk-adjusted sum of discounted cash flows. Accordingly, today firms with relatively greater cash flow to market value are expected to have relatively less cash flow growth in the future.
Insider × Free cash flow (FCF)	Free cash flow variable multiplied by insider ownership.
Dummy (*q*-ratio $<$ 1, free cash flow $>$ 0)	A dummy variable that is 1 when both the *q*-ratio is less than 1 and the free cash-flow variable is positive. The dummy is 0 otherwise.
Momentum	Following Loughran and Ritter (1996), we define momentum as buy and hold market-adjusted returns for the *j*th firm in our sample as: $$\text{BHMAR}_{j,T_{-150},T_{-31}} = \left[\prod_{t=T_{-150}}^{T_{-31}}\left(1+R_{jt}\right)\right] - \left[\prod_{t=T_{-150}}^{T_{-31}}\left(1+R_{mt}\right)\right],$$ where T_{-150} and T_{-31} are the first and the last trading day included in the holding period we use to calculate buy and hold returns (i.e., 150 and 31 trading days prior to the deregistration announcement, respectively), R_{jt} is the daily return for sample firm *j* on date *t*, and R_{mt} is the return on the Russell 2000 Index on the same date.
Volume (turnover)	It is computed as the ratio of average daily trading volume over a period of 150 trading days over total outstanding shares. We computed the turnover in the pre-deregistration period ($t_0 - 150$ to $t_0 - 31$), where t_0 is the effective deregistration date. In order to rule out the noise of the deregistration announcement on the volume (turnover), we excluded 30 days before that date.

[a]Our results are robust to an alternative measure of free cash flow, in particular, the measure suggested by Lehn and Poulsen (1989).

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TABLE 2 (continued)
Variable Index

Panel 2. Market Liquidity Variables

Variables	Description
Mean dollar spread ($)	Dollar spreads are defined as (closing ask price − closing bid price). Computed using daily average dollar spread over a period of 60 trading days. To analyze the change in dollar spread, we compare it both before and after deregistration. To do this, we compare dollar spread in the pre-deregistration period (t_0 − 90 to t_0 − 31) with that for the post-deregistration period (t_0 + 31 to t_0 + 90), where t_0 is the effective deregistration date. In order to rule out the noise of the deregistration announcement on mean dollar spread, we excluded the 30 days before and after the deregistration date.
Mean percentage spread (%)	Percentage spreads are calculated as (closing ask price − closing bid price)/(midpoint of closing ask and bid prices) × 100. Computed using daily average mean percentage spread over a period of 60 trading days. To analyze the change in mean percentage spread, we compare it both before and after deregistration. To do this, we compare mean percentage spread in the pre-deregistration period (t_0 − 90 to t_0 − 31) with the that for the post-deregistration period (t_0 + 31 to t_0 + 90), where t_0 is the effective deregistration date. In order to rule out the noise of the deregistration announcement on mean percentage spread, we excluded the 30 days before and after the deregistration date.
Mean volatility (%)	Volatility is calculated as the standard deviation of the daily returns of the stocks in the sample. It is computed over a period of 60 trading days. To analyze the change in mean volatility, we compare it then before and after deregistration. To do this, we compare mean volatility in the pre-deregistration period (t_0 − 90 to t_0 − 31) with that for the post-deregistration period (t_0 + 31 to t_0 + 90), where t_0 is the effective deregistration date. In order to rule out the noise of the deregistration announcement on mean volatility, we excluded the 30 days before and after the deregistration date.
Volume (turnover) (%)	Volume traded over total outstanding shares × 100. Computed using the average daily trading volume over a period of 60 trading days. To analyze the change in relative turnover, we compare it both before and after deregistration. To do this, we compare relative turnover in the pre-deregistration period (t_0 − 90 to t_0 − 31) with the relative turnover for the post-deregistration period (t_0 + 31 to t_0 + 90), where t_0 is the effective deregistration date. In order to rule out the noise of the deregistration announcement on the relative turnover, we excluded the 30 days before and after the deregistration date.
Trading days	The number of days a firm's stock is traded (days when the traded volume is greater than 0) over a period of 60 trading days. To analyze the change in relative trading, we compare the trading days in the pre-deregistration period (t_0 − 90 to t_0 − 31) with the trading days for the post-deregistration period (t_0 + 31 to t_0 + 90), where t_0 is the effective deregistration date. We excluded the 30 days before and after the deregistration date in order to rule out the noise of the deregistration announcement on the trading days.

tum) or high liquidity since they would have to give up the security issue benefits related to a relatively high valuation or market liquidity. We examine the impact of momentum and trading volume by including pre-deregistration trading volume and market-adjusted buy and hold returns in our logit model. Following Loughran and Ritter (1996), we define buy and hold market-adjusted returns for the *j*th firm in our sample as:

$$(1) \qquad \text{BHMAR}_{j,T_{-150},T_{-31}} = \left[\prod_{t=T_{-150}}^{T_{-31}} (1+R_{jt})\right] - \left[\prod_{t=T_{-150}}^{T_{-31}} (1+R_{mt})\right],$$

where T_{-150} and T_{-31} are the first and the last trading day we use to calculate buy and hold returns, R_{jt} is the daily return for sample firm j on date t, and R_{mt} is the return on the Russell 2000 Index on the same date. We chose the Russell 2000 because the firms covered are relatively small.

The average daily volume or turnover is also measured from 150 to 31 trading days prior to the deregistration announcement. The leverage variable is motivated by earlier results from the disclosure literature. Palepu (1987), Healy and Palepu (1990), and DeAngelo, DeAngelo, and Skinner (1996) find that highly leveraged firms are more likely to make strategic decisions (here the decision to

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go dark) to conserve cash.[15] Finally, the log of the firm's assets is introduced to control for any remaining size effects on the decision to go dark.

Audit fees reflect some of the most obvious and measurable costs of regulatory compliance. As noted above, the audit-related costs of Sarbanes-Oxley compliance are viewed as a primary reason for firms' choosing to go dark. We considered two measures of audit fees: the ratio of audit fees to the market value of the firm's equity and the natural log of audit fees. The audit fee was obtained from the Audit Analytics database.[16] In addition, we examine the impact of the passage of Sarbanes-Oxley on the likelihood of going dark using a dummy variable. A financial institution (FI) dummy is also introduced since regulated financial institutions will have to continue to report to regulators after deregistering with the SEC and therefore may have different incentives to go dark.

B. The Matched Logit Results

Table 3 presents the coefficient score results of the logit analysis together with the elasticity (economic importance) for each of the explanatory variables described above. The elasticities for each explanatory variable are calculated as $d\ln(F)/d\ln(x)$, where d is the first derivative, $\ln(F)$ is the natural logarithm of the density function, and $\ln(x)$ is the natural logarithm of the explanatory variable, and they are evaluated at their sample means. In Table 3, we examine five models, starting with a set of variables for which observations are available for the entire sample (i.e., 543 observations), and then introduce additional variables successively. Each decline in sample size reflects the reduction in the number of available observations resulting from the inclusion of an additional explanatory variable. For example, for the audit fee variables we have only 310 observations out of 543 going dark and matched firms. The disclosure of audit fees in proxy statements became mandatory only after February 5, 2001.[17]

As Table 3 shows, firms with a high q-ratio have lower incentives to go dark. For example, a 1% increase in the q-ratio lowers the probability of going dark by 0.30% (from its mean value) in model 5. This suggests that staying registered allows relatively profitable firms the benefit of continued access to external equity funding so as to finance their profitable (high q-ratio) investments.

Free cash flow is statistically insignificant throughout the models tested in Table 3. The primary reason for this is that, unlike LBOs, the cash flow of going dark firms has been on average low over our sample period. Indeed, for 120 firms

[15] Since our sample includes financial institutions, we choose the ratio of total liabilities over assets as our common measure of leverage. Using the total debt to assets ratio after excluding financial institutions from our sample generates similar results.

[16] We find considerable variability in both absolute and relative audit costs. For example, Soligen Technologies, with a total market capitalization of $4,441,440, paid $44,549 in audit fees in the fiscal year ended on March 31, 2001. Teltone Corp., with a smaller market capitalization of $823,920, was billed $27,769.5 for the audit of its annual financial statements for the fiscal year ended June 30, 2002. While Soligen's audit fees were 1% of the market value of its equity, for Teltone—a smaller company—the audit cost was higher in percentage terms, amounting to 3.4% of its market capitalization. Variation in audit fees paid by companies is also well documented in the accounting literature (see, for example, Turpen (1995)).

[17] See http://www.sec.gov/rules/final/33-7919.htm for further details.

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TABLE 3

Logistic Regression of the Probability of Deregistration over the Period January 1996–May 2004 Using the Matched Control Group

Table 3 reports the coefficient score results and the elasticity of logit tests for the going dark firms using the matched control group. The dependent variable is a binary that takes a value of 1 for the firms which chose to deregister and 0 for the matching firms. The standard error (SE) is reported in parentheses and elasticity was calculated as $d(\ln F)/d(\ln x)$, where d is the first derivative, $\ln(F)$ is the natural logarithm of the density function and $\ln(x)$ is the natural logarithm of the explanatory variable. The elasticity is evaluated at the sample means of the explanatory variables. These tests exclude foreign firms, firms that emerged from bankruptcy in the year before going dark, shell corporations (a corporation without any business activity), and firms for which accounting or stock price data was not available. After such screening, 261 firms remained in our sample. The matching firms were chosen based on three criteria: i) a firm's 4-digit SIC code, ii) a firm's average asset size over the 3 years prior to announcing it was going dark, and iii) the market for the common stock (major exchanges or OTC) at the end of the last fiscal year prior to deregistration. The total number of matching firms is 282.

	Model 1		Model 2		Model 3		Model 4		Model 5	
Variables	Coeff. (SE)	Elasticity	Coeff. (SE)	Elasticity	Coeff. (SE)	Elasticity	Coeff. (SE)	Elasticity	Coeff. (SE)	Elasticity
q-ratio	−0.26 (0.06)**	−0.34	−0.22 (0.06)**	−0.29	−0.23 (0.06)**	−0.29	−0.35 (0.09)**	−0.46	−0.26 (0.12)*	−0.30
Log(assets)	−0.20 (0.07)**	−0.30	−0.15 (0.07)*	−0.22	−0.18 (0.07)*	−0.27	−0.17 (0.08)*	−0.27	−0.19 (0.12)	−0.35
Intangible asset ratio	−0.64 (0.61)	−0.02	−0.57 (0.62)	−0.02	−0.61 (0.62)	−0.02	−0.41 (0.67)	−0.02	0.43 (1.00)	0.02
Leverage	0.47 (0.11)**	0.25	0.41 (0.11)**	0.22	0.41 (0.11)**	0.22	0.58 (0.14)**	0.33	0.56 (0.21)**	0.31
FI dummy	0.16 (0.25)	0.02	0.18 (0.26)	0.02	0.20 (0.26)	0.02	0.03 (0.28)	0.00	0.08 (0.38)	0.01
Insider ownership	—	—	1.69 (0.42)**	0.35	1.60 (0.41)**	0.33	1.81 (0.45)**	0.39	2.47 (0.67)**	0.52
Free cash flow (FCF)	—	—	−0.52 (0.35)	−0.02	—	—	−0.44 (0.35)	−0.02	−0.45 (0.47)	−0.02
Dummy ($q < 1$, FCF > 0)	—	—	0.21 (0.23)	0.03	0.13 (0.22)	0.02	0.18 (0.24)	0.02	0.74 (0.32)*	0.12
Insider × FCF	—	—	—	—	0.11 (0.71)	0.00	—	—	—	—
Volume (turnover)	—	—	—	—	—	—	−51.6 (31.3)	−0.05	−50.8 (36.3)	−0.05
Momentum	—	—	—	—	—	—	−0.39 (0.15)**	−0.003	−0.46 (0.20)*	−0.02
Audit fees to MVE[a]	—	—	—	—	—	—	—	—	6.29 (3.19)*	0.11
Constant	0.61 (0.25)*	—	−0.31 (0.33)	—	−0.14 (0.32)	—	−0.18 (0.37)	—	−0.94 (0.57)	—
No. of observations	543		530		530		489		295	
LR χ^2	40.78**		58.70**		55.74**		78.51**		64.17**	
Pseudo R^2	0.05		0.08		0.08		0.12		0.16	
Log likelihood	−355.58		−337.64		−339.12		−298.71		−170.76	

** and * indicates p-values of 1% and 5%, respectively.

[a]Similar results are obtained for an alternative measure of audit fees, specifically, log audit fees.

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out of 261 in the deregistering sample, cash flow was actually negative in the year prior to deregistration.

The cash flow and q-ratio interaction dummy variable takes a value of 1 if the cash flow is positive and the q-ratio of the firm is less than 1, i.e., has few future growth opportunities. For all other firms, this variable takes a value of 0. As can be seen from Table 3, this interaction dummy variable is positive and significant (at the 5% level) in model 5, implying that positive cash flow firms with low q-ratios (low growth opportunities) are more likely to go dark. However, it is not statistically significant in the other models.

As expected, the insider ownership variable is significantly positive at the 1% level for all relevant models. For example, the results of model 5 imply that a 1% increase in insider ownership increases the probability of going dark by 0.52% (from its mean value). The interaction of insider ownership with cash flow appears to be less important in explaining the going dark trend.

Consistent with the arguments made in the press and in public petitions to the SEC, the audit fee/MVE ratio—which reflects the direct costs of remaining registered—has a positive and significant (at the 5% level) effect on the probability of going dark. Moreover, a 1% increase in the audit fee/ MVE ratio increases the probability of going dark by 0.11% (from its mean value) in model 5 in Table 3. In addition, using the log of audit fees as an alternative measure produces a similar positive effect on the probability of going dark. Thus, importantly, we find that in addition to the economic and agency-related incentives to go dark, audit costs are also an important factor underlying the deregistration decision.

As implied by the disclosure literature, highly levered firms are more likely to go dark. As can be seen, the leverage variable is positive and significant at 1% in all models in Table 3. For example, a 1% increases in leverage increases the probability of going dark increase by 0.31% (in model 5). As expected, a positive share price momentum reduces the probability of going dark. Specifically, a 1% increase in the 120-day return momentum reduces the probability of going dark by 0.02% (significant at the 5% level) in model 5. The size variable (log of assets) is statistically significant and negative in models 1 to 4 but not significant in model 5. The coefficients for the intangible assets ratio and the FI dummy variable are statistically insignificant.

Overall, our results suggest that the main factors impacting a firm's decision to go dark are its q-ratio, its insider ownership concentration, leverage, momentum, and its audit fees.

C. Unmatched Logit Tests

Section III.B examines the factors driving the deregistration decision for a sample matched by asset size, equity market, and industry. It could be argued that *all firms with fewer than 300 (500) shareholders of record* could go dark and thus should be the appropriate holdout sample in a logit analysis. For completeness and as a robustness check, we also construct an unmatched sample by using all firms available on EDGAR with stockholders of record below 300 (500) over the 1996–2004 period (we refer to it as the unmatched control group). For the firms with holders of record greater or equal to 300 and less than 500, we only include firms

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with assets below $10 million in the past three years. We also excluded foreign firms, shell corporations, bankrupt firms and firms in their first year of registering with SEC (because they are not eligible to deregister). After such screening, we are left with 1,860 firms in our sample. Note that a firm could go dark during any year as long as its holders of record satisfied the 300 (500) criteria. As a result, our sample may include some firms more than once. Overall, there are 7,114 firm-years in the sample. However, as discussed earlier, we believe that the matched approach has certain advantages over the unmatched approach in analyzing the going dark decision.

Table 4 presents the coefficient score results and the elasticities (economic importance) of the logit analysis using the same explanatory variables discussed in Section III.A. Comparing the results in Table 4 (the logit results using the unmatched control group) with those in Table 3 (the logit results using the matched control group), with the exception of the momentum and the FIs dummy, we find similar results to the matched logit. In particular, both the audit cost and insider ownership variables remain statistically significant.

D. Additional Robustness Checks

1. The Sarbanes-Oxley Act

The Sarbanes-Oxley Act's passage in July 2002 may also have altered firms' incentives for going dark. To examine this question, we construct a dummy variable that takes a value of 1 if the firm deregistered after the passage of Sarbanes-Oxley on July 31, 2002 and 0 otherwise. This dummy variable is also interacted with the audit fee ratio. Interestingly, we find both the dummy variable on its own as well as its interaction with audit fees are positive and statistically significant at the 1% level.[18] This is consistent with the argument that firms are more likely to go dark post-Sarbanes-Oxley and that in the post-Sarbanes-Oxley period the impact of audit fees has become more important.

2. Institutional Ownership

To examine the effects of institutional ownership, we collect institutional ownership data from the Thompson Financial database. There are institutional ownership data for 99 of the going dark firms and 124 of the matched firms. We collect these data from the quarter before the firm went dark. We find institutional ownership to be negative and significant at the 1% level with our prior results remaining generally unchanged. The logit model predicts that a 1% increase in institutional ownership decreases the probability of going dark by 0.36% (relative to its mean).[19]

[18] We also test the impact of the November 2001 Enron/Arthur Andersen debacle on firms' incentives to go dark. We find that both the dummy variable on its own and its interaction with audit fees are positive and significant at the 1% level. Tables are available from the authors on request.

[19] We also examine a variety of other variables that may have impacted a firm's decision to go dark, but we find them insignificant. These variables include a dummy for hi-tech firms, past growth in sales revenue, the ratio of R&D expenditures to sales, capital expenditure growth, auditors turnover, and executive compensation.

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TABLE 4

Logistic Regression of the Probability of Deregistration over the January 1996–May 2004 Period Using the Unmatched Control Group (firms with fewer than 300/500 holders of record)

Table 4 reports the coefficient score results and the elasticity of logit tests for the going dark sample using the unmatched control group of all firms with holders of record less than 300/500. The dependent variable is a binary that takes a value of 1 for the firms that chose to deregister and 0 for the unmatched control group firms. The standard error (SE) is reported in parentheses and elasticity was calculated as $d(\ln F)/d(\ln x)$, where d is the first derivative, $\ln(F)$ is the natural logarithm of the density function, and $\ln(x)$ is the natural logarithm of the explanatory variable. The elasticity is evaluated at the sample means of the explanatory variables. These tests exclude foreign firms, firms that emerged from bankruptcy in the year before going dark, shell corporations (a corporation without any business activity), and firms for which accounting or stock price data was not available. After such screening, 261 firms remained in our going dark sample and 7,114 in our unmatched control group.

	Model 1		Model 2		Model 3		Model 4		Model 5	
Variables	Coeff. (SE)	Elasticity	Coeff. (SE)	Elasticity	Coeff. (SE)	Elasticity	Coeff. (SE)	Elasticity	Coeff. (SE)	Elasticity
q-ratio	−0.65 (0.08)**	−1.55	−0.54 (0.08)**	−1.29	−0.55 (0.08)**	−1.31	−0.56 (0.10)**	−1.31	−0.85 (0.18)**	−0.38
Log(assets)	−0.71 (0.04)**	−3.06	−0.71 (0.05)**	−3.02	−0.73 (0.05)**	−3.12	−0.62 (0.06)**	−2.71	−0.72 (0.09)**	−0.41
Intangible asset ratio	−0.31 (0.50)	−0.03	−0.39 (0.50)	−0.04	−0.40 (0.50)	−0.04	−0.42 (0.52)	−0.04	−0.05 (0.71)	−0.08
Leverage	0.67 (0.09)**	0.39	0.58 (0.09)**	0.32	0.59 (0.09)**	0.33	0.59 (0.10)**	0.32	1.48 (0.26)**	0.13
FI dummy	1.27 (0.18)**	0.13	1.39 (0.18)**	0.11	1.40 (0.18)**	0.11	1.14 (0.20)**	0.10	1.57 (0.28)**	0.02
Insider ownership	—	—	1.88 (0.32)**	0.58	1.83 (0.32)**	0.56	1.08 (0.36)**	0.33	1.45 (0.51)**	0.15
Free cash flow (FCF)	—	—	−0.17 (0.19)	−0.00	—	—	−0.25 (0.20)	−0.00	−0.18 (0.27)	−0.00
Dummy ($q < 1$, FCF > 0)	—	—	0.49 (0.17)**	0.07	0.42 (0.17)**	0.06	0.24 (0.18)	0.04	0.55 (0.24)*	0.04
Insider × FCF	—	—	—	—	0.45 (0.52)	0.00	—	—	—	—
Volume (turnover)	—	—	—	—	—	—	−329 (57.0)**	−2.00	−262 (78.4)**	−0.48
Momentum	—	—	—	—	—	—	−0.15 (0.14)	−0.01	−0.14 (0.20)	−0.02
Audit fees to MVE	—	—	—	—	—	—	—	—	14.46 (3.27)**	0.02
Constant	−0.18 (0.18)		−1.10 (0.26)**	—	−0.97 (0.25)**	—	−0.25 (0.29)	—	−0.86 (0.45)	—
No. of observations	7,374		6,827		6,827		6,037		3,662	
LR χ^2	452.29**		502.67**		502.64**		537.82**		434.19**	
Pseudo R^2	0.20		0.23		0.23		0.28		0.38	
Log likelihood	−902.23		−837.12		−837.14		−704.97		−354.41	

** and * indicate p-values of 1% and 5%, respectively.

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IV. The Impact of Deregistration Announcements on Stockholders

A. Announcement Effects

In this section, we examine the impact of deregistration announcements on stockholders. Over the period from January 1996 to May 2004, we identify 238 firms with stock price data available on Datastream as announcing planned deregistrations that are unrelated to bankruptcies, liquidations, or mergers. This comprises 188 non-financial firms and 50 financial firms.[20] We analyze two event windows. The date of the announcement (the event date) is day 0 and the numbers in the parentheses identify the starting and ending date of each event window relative to the event date. The first window, $(0, +1)$ attempts to capture the immediate impact of the deregistration announcement. The window $(0, +5)$ recognizes the potentially slow public diffusion of these announcements due to the relatively small size of some of these firms. We focus our discussion primarily on the $(0, 1)$ day announcement effects. Panels 1a, 1b, and 1c of Table 5 show the share price effect of going dark using three different definitions of the event date: i) the earliest of the public announcement and the Form 15 filing, ii) the announcement date, and iii) the filing date. As Table 5 shows, for non-financial firms announcing their intention to deregister the cumulative average abnormal return (CAAR) is significantly negative at the 1% level or better, and is large in absolute terms for all event windows.[21] For example, Table 5 shows that the $(0, 1)$ window mean cumulative abnormal returns were -12.03% (Panel 1a), -10.99% (Panel 1b), and -10.33% (Panel 1c). These results indicate that, on average, stockholders suffer large and significant wealth losses from firms' decisions to go dark.

However, investors may not be affected in the same way by all deregistration decisions. For firms that announce their deregistration while still trading on a major exchange, the joint impact of the loss of disclosure and additional liquidity and oversight provided by the exchange may be greater than the announcement effect for firms that are trading OTC. Panel 2 in Table 5 shows that the magnitude of the impact is greater for exchange listed deregistering firms relative to the subsample that traded OTC.[22] For example, the mean cumulative abnormal return is -16.74% for the $(0, 1)$ event window for exchange listed firms compared to -10.84% for the OTC subsample. Note, however, that the difference in mean abnormal returns is statistically insignificant.

Panel 3 of Table 5 examines the impact of deregistration before and after the enactment of the Sarbanes-Oxley Act on July 31, 2002 for non-financial firms. Investors appear to react as negatively to deregistration announcements after the enactment as they did before July 31, 2002. This finding is consistent with outside

[20] The sample size is different from that in the logit analysis because the additional requirement of the availability of Datastream stock price data eliminates 24 firms from the original 261 firm sample.

[21] We use standardized abnormal returns following Patell (1976).

[22] These findings are consistent with our earlier logit analysis (see Section III). Small firms are affected more by compliance costs (as measured by audit fees) and, therefore, they are more likely to deregister. But the market reaction is less severe than it is for larger firms since the audit cost savings are relatively greater for smaller firms. We find that the ratio of audit fees to assets is significantly higher for firms below median size than for larger firms. A univariate test confirms this result at the 1% level.

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TABLE 5

Stock Price Reaction to the Announcement of Deregistration over the January 1996–May 2004 Period

Table 5 presents the results of an event study testing the impact of deregistration announcements on the share price. The model is $R_{i,t} = \alpha_i + \beta_i R_{M,t} + \varepsilon_{i,t}$, where $R_{i,t}$ is the return on the common stock of the ith company in our sample at time t; $R_{M,t}$ is the return on the value-weighted Market Index (Russell 2000) at time t, and $\varepsilon_{i,t}$ is the error term. Return data for each sample firm was obtained from Datastream. Standardized abnormal returns are following Patell (1976). The Patell test standardizes the event-date prediction error for each stock by its standard deviation. The market model was estimated using the Scholes-Williams adjustment for thinly traded firms over a 255-day period, ending 46 days before the event day. Panel 1 presents the results for 188 non-financial sample firms that had return data available on Datastream. Panel 2 divides non-financial firms into two subsamples based on their trading venue before deregistration and shows the cumulative average abnormal returns (CAAR) for each group. Panel 3 contains the results for the pre- and post-Sarbanes-Oxley subsamples. Results for all 50 financial institutions with Datastream data are displayed in Panel 4. Panel 5 displays the CAARs for both firms that either repurchased shares or implemented a reverse stock split and those that did neither. Panel 6 shows the results of an event study on the sample pre-1999 OTCBB deregistering firms and Pink Sheets deregistering firms.

Event Windows	No. of Obs.	CAAR	Positive:Negative	Std. Error
Panel 1a. Abnormal Returns—Non-Financial Firms That Announced Their Deregistration over the Sample Period (the event date is earlier than the announcement and the filing date unless stated otherwise)				
(0, +1)	188	−12.03%	55:129	0.79%**
(0, +5)	188	−12.01%	55:129	1.36%**
Panel 1b. Abnormal Returns—Non-Financial Firms That Announced Their Deregistration over the Sample Period (the event date is the announcement date)				
(0, +1)	188	−10.99%	56:128	0.79%**
(0, +5)	188	−7.97%	55:129	1.35%**
Panel 1c. Abnormal Returns—Non-Financial Firms That Announced Their Deregistration over the Sample Period (the event date is the filing date)				
(0, +1)	187	−10.33%	58:125	0.80%**
(0, +5)	187	−0.43%	64:119	1.14%
Panel 2a. Abnormal Returns—Non-Financial Firms That Announced Their Deregistration While Trading on One of the Major Exchanges				
(0, +1)	38	−16.74%	11:27	1.16%**
(0, +5)	38	−18.68%	9:29	1.98%**
Panel 2b. Abnormal Returns—Non-Financial Firms That Announced Their Deregistration While Trading OTC (on the OTCBB or the Pink Sheets)				
(0, +1)	150	−10.84%	44:102	1.03%**
(0, +5)	150	−10.32%	46:100	1.78%**
Panel 3a. Abnormal Returns—Firms That Deregistered after the Passage of the Sarbanes-Oxley Act of 2002				
(0, +1)	124	−13.65%	35:87	0.95%**
(0, +5)	124	−8.96%	38:84	1.60%**
Panel 3b. Abnormal Returns—Firms That Deregistered before the Passage of the Sarbanes-Oxley Act of 2002				
(0, +1)	64	−8.88%	20:42	1.44%**
(0, +5)	64	−17.92%	17:45	2.53%**
Panel 4. Abnormal Returns—Financial Institutions That Announced Their Deregistration over the Sample Period				
(0, +1)	50	−1.67%	20:27	0.38%
(0, +5)	50	−2.79%	22:25	0.67%
Panel 5a. Abnormal Returns—Deregistering Non-Financial Firms That neither Repurchased Shares nor Implemented a Reverse Stock Split to Reduce Number of Their Shareholders of Record				
(0, +1)	154	−12.05%	41:109	0.86%**
(0, +5)	154	−10.01%	42:108	1.47%**
Panel 5b. Abnormal Returns—Deregistering Non-Financial Firms That Repurchased Shares or Implemented a Reverse Stock Split to Reduce the Number of Their Shareholders of Record				
(0, +1)	34	−11.92%	14:20	2.03%*
(0, +5)	34	−21.05%	13:21	3.44%**
Panel 6. Abnormal Returns—Non-Financial Firms That Announced Their Deregistration While Trading on the Pink Sheets and on the Pre-Eligibility Rule (i.e., pre-January 1, 1999) OTCBB				
(0, +1)	40	−6.69%	13:24	1.63%**
(0, +5)	40	−12.48%	11:26	2.79%*

*indicates significance at the 5%. **indicates significance at the 1% level.

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investors balancing their corporate governance control losses related to a post-Sarbanes-Oxley deregistration against the savings in higher auditing and other compliance costs related to the Act. That is, on a net benefit/cost basis, outside investors do not view the overall effects of deregistrations as being worse post- versus pre-Sarbanes-Oxley. Of course, for inside shareholders (as discussed earlier) the weakening of corporate governance control and the lowering of auditing/compliance costs are both potential benefits.

Banks and other financial institutions[23] have to continue to provide accounting and other disclosures to the Federal Deposit Insurance Corporation (FDIC), the Federal Reserve, the Office of the Comptroller of the Currency (OCC), the Office of Thrift Supervision (OTS), and other regulators through call reports and other regulatory filings post-going dark. Moreover, they continue to be examined (audited) by bank regulators. From Panel 4 of Table 5, it is evident that the negative impact for financial institutions in our sample is very different from that for non-financial institutions. Indeed, the -1.67% cumulative abnormal return for the $(0, 1)$ event window is not significantly different from 0. Also, the difference between financial institutions' mean cumulative abnormal returns and those of non-financial firms is statistically significant at the 1% level for the $(0, 1)$ event window.[24]

Finally, Panel 5 of Table 5 shows that limited share repurchases and reverse splits do not have a significant impact on investors' reactions to going dark.

B. Disentangling the Deregistration and Delisting Announcement Effect: A Robustness Check and Natural Experiment

There is the possibility that the delisting announcement effect may add noise to our measurement of the deregistration announcement effect. As a robustness check, we take the subsample of firms trading on the OTCBB prior to the passage of the 1999 regulation requiring firms trading on the OTCBB to register with the SEC. Firms that were traded on the OTCBB, prior to 1999, could deregister *without* delisting from the OTCBB. We also added firms traded on the Pink Sheets at the time of their deregistration announcement. They too did not have to delist if they deregistered. Essentially, this subsample provides a natural experiment relating to the size of the pure deregistration effect in the OTC markets. We identified 40 such non-financial firms. As Table 5, Panel 6 shows, their average cumulative abnormal return over the $(0, 1)$ window period was -6.7%, which is significantly different from 0 at the 1% level.

[23] We have 50 financial institutions in our sample, the majority of which (32 firms) are banks or thrift institutions.

[24] It might be noted that Basel II capital adequacy reforms have put greater emphasis on regulatory monitoring in their Pillar 2 reforms, and this might further weaken the going dark effect on bank equity investors in the future.

V. The Market after Going Dark

A. The Impact of Deregistration on Liquidity

As described in Section IV, a firm that goes dark without buying out all outside shareholders imposes a significant value loss on existing stockholders. In this section, we examine one potential source of value loss, namely the reduction in liquidity. Liquidity may decline after going dark because i) the lack of continued disclosure increases uncertainty and may lead to higher bid-ask spreads, and ii) stocks of deregistered firms are no longer eligible for trading on the major exchanges or the OTCBB.

To analyze the liquidity loss, we compare various measures of liquidity before and after deregistration. To do this, we compare liquidity measures in the pre-deregistration period ($t_0 - 90$ to $t_0 - 31$) with liquidity measures for the post-deregistration period ($t_0 + 31$ to $t_0 + 90$), where t_0 is the effective deregistration date. In order to rule out the noise of the deregistration announcement on the liquidity of trading, we exclude 30 days before and after the deregistration date.

Following Macey, O'Hara, and Pompilio (2004), we use five measures of liquidity, namely, dollar spread, percentage spread, volatility of rate of return, volume (turnover), and the number of days on which a trade occurs in a stock. The bid-ask spread data are collected from two sources, either from Center for Research in Security Prices (CRSP) (for NASDAQ listed deregistering firms) or the Pink Sheets. Return data, volume data, and trading days are collected from Datastream. The results, presented in Table 6, provide information on mean spreads, volume, volatility, and trading days for different subsamples.

As Panel 1 in Table 6 shows, three out of five measures of liquidity—the bid-ask spread, volatility, and trading days—suggest that on average the stocks that go dark become significantly less liquid. On the other hand, the dollar spread and volume traded were little affected for the whole sample. In general, the stocks of deregistering non-financial firms in the different subsamples (Panels 2 to 4 of Table 6) become less liquid. In particular, in Panel 2 of Table 6, we show the mean liquidity impact on firms deregistering while trading on a major exchange. In this case three out of five measures of liquidity show a significant worsening post-deregistration. In Table 6, Panel 3 we show the liquidity effects on non-financial OTC firms. In percentage terms, while the percentage spread, volatility and trading days for exchange listed firms moves in an adverse direction by 159%, 113%, and 33%, respectively, the percentage spread, volatility, and trading days for OTC listed firms moves in an adverse direction by 40%, 63%, and 25%, respectively. Table 6, Panel 4 summarizes the liquidity effects for all non-financial firms.

Finally, Panel 5 of Table 6 shows that the liquidity effects on deregistering financial institutions' stocks are less adverse than for deregistering firms in general. Indeed, only one of the five liquidity measures, the decrease in the number of trading days, shows an adverse move that is statistically significant. This is consistent with the post-deregistration production of information for regulatory purposes having a positive impact on the liquidity of financial institutions relative to non-financial firms after going dark.

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TABLE 6

Trading and Liquidity before and after Deregistration

Table 6 displays trading and liquidity information for the deregistered firms with the SEC. The bid-ask spread was collected from two sources: CRSP (for the pre-deregistration period of subsample 1, the exchange deregistered firms) or the Pink Sheets. The return data, volume, and number of trading days were collected from Datastream. Panels 1 to 5 provide measures of mean dollar spread, mean percentage spread, volatility, volume, and number of trading days for different subgroups. To analyze liquidity, we compare liquidity before and after deregistration. To do this, we compare liquidity in the pre-deregistration period ($t_0 - 90$ to $t_0 - 31$) with liquidity for the post-deregistration period ($t_0 + 31$ to $t_0 + 90$), where t_0 is the effective deregistration date. In order to rule out the noise of the deregistration announcement, we excluded 30 days before and after the deregistration date. We included only that subsample of going dark firms that have data from the Pink Sheets/Datastream and such data that are available before and after deregistration. Dollar spreads are defined as (closing ask price − closing bid price). Percentage spreads are calculated as (closing ask price − closing bid price)/(midpoint of closing ask and bid prices) × 100. Volatility is calculated as the standard deviation of daily returns of the stocks in the sample. Volume turnover is calculated as the percentage of average daily volume to outstanding shares. Trading days are calculated as the number of days when trading occurred. Difference of means tests are two-sided tests and assume unequal variances.

	Obs.	Prior to Deregistration	After Deregistration	Std. Error
Panel 1. All Sample Firms (financial plus non-financial)				
Mean dollar spread ($)	174	1.108	10.801	7.35
Mean percentage spread (%)	174	33.976	51.353	4.46**
Mean volatility (%)	226	11.400	19.055	0.83**
Volume turnover (%)	203	0.103	0.088	0.03
Trading days	203	27.192	19.557	1.64**
Panel 2. Subsample of Non-Financial Firms That Announced Their Deregistration While Trading on One of the Major Exchanges				
Mean dollar spread ($)	23	0.263	0.743	0.22*
Mean percentage spread (%)	23	14.29	37.02	9.06*
Mean volatility (%)	36	6.81	14.53	4.54
Volume turnover (%)	34	0.15	0.06	0.06
Trading days	34	36.765	24.471	4.13**
Panel 3. Subsample of Non-Financial Firms That Announced Their Deregistration While Trading OTC (on the OTCBB or the Pink Sheets)				
Mean dollar spread ($)	114	0.359	4.013	3.16
Mean percentage spread (%)	114	43.40	60.85	5.70**
Mean volatility (%)	144	14.67	23.99	3.21**
Volume turnover (%)	128	0.09	0.10	0.09
Trading days	128	27.57	20.77	2.09**
Panel 4. Subsample of All Non-Financial Firms That Announced Their Deregistration over the Sample Period				
Mean dollar spread ($)	137	0.34	3.46	2.63
Mean percentage spread (%)	137	38.51	56.85	5.12**
Mean volatility (%)	180	13.09	22.10	2.75**
Volume turnover (%)	162	0.11	0.09	0.02
Trading days	162	29.50	21.54	1.89**
Panel 5. Subsample of Financial Firms				
Mean dollar spread ($)	37	3.94	37.97	33.11
Mean percentage spread (%)	37	17.17	31.00	7.62
Mean volatility (%)	46	4.77	7.13	2.54
Volume turnover (%)	41	0.09	0.08	0.03
Trading days	41	18.07	11.71	2.46**

*indicates significance at the 5% level. **indicates significance at the 1% level.

B. Post-Deregistration Stock Price Performance

We next examine the long-run stock return performance of going dark stocks. We first examine their six- and one-year returns post-deregistration. We also examine six-month and one-year returns for a subsample of firms that only had a full year of post-deregistration data. None of these holding period returns are significantly different from 0.[25]

[25] Further details are available from the authors.

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VI. Conclusions and Public Policy Implications

Consistent with anecdotal evidence, we find that the compliance cost—as measured by audit fees—and the passage of the Sarbanes-Oxley Act are among the major driving forces behind a firm's decision to go dark. Firms with fewer growth opportunities, greater insider ownership, lower institutional ownership, lower market momentum, and higher leverage are also more likely to go dark. It is also clear that investors in firms suffer significant negative cumulative abnormal returns upon the announcement of deregistration and are generally left holding less liquid shares, but this effect does not hold for regulated financial institutions.

The adverse impact on investors identified in this paper is the direct result of insiders' ability to exploit Section 12(g)(5) of the 1934 Securities Exchange Act. That is, insiders exploit the "300 shareholder rule" for remaining a publicly registered company, where "stockholders" are measured only by the number of shareholders of record rather than beneficial shareholders. The cost of tracking the number of beneficial owners does not appear to be a sufficient argument in favor of maintaining this status quo. Indeed, firms are able to determine the number of their beneficial owners for all other purposes (such as soliciting proxies) without difficulty. Clearly, the loss of shareholder value and liquidity as a consequence of this rule, suggests that there may be a case for the SEC to reexamine Section 12(g)(5) and its approach toward counting the minimum number of shareholders required for registration as a public company.

Finally, since the highest cost of Sarbanes-Oxley compliance appears to fall heavily on smaller companies, the SEC might consider ameliorating some of the reporting burden on these companies. Indeed, in its April 23, 2006 final report, the SEC's Advisory Committee on Smaller Public Companies recommended substantial relief for small firms, suggesting for example that the smallest public companies should continue to be exempt from SOX Section 404 internal control requirements "unless and until" a framework is developed to allow cost effective compliance.[20] The SEC has already postponed the deadline for Section 404 compliance for smaller firms several times, most recently in December 2006 (according to the new deadline annual reports filed for fiscal years ending on or after December 15, 2008 must fully comply with SOX Section 404).

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[20] See http://www.sec.gov/info/smallbus/acspc.shtml for further details.

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