

# **WHY FIRMS GO DARK**

Lingzi Zhu

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This is to certify that the thesis prepared

By: Lingzi Zhu\_\_\_\_\_

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Signed by the final Examining Committee:

Dr. Chauhun\_\_\_\_\_Chair

Dr. Gregory J. Lypny\_\_\_\_\_Examiner

Dr. Ravi Mateti\_\_\_\_\_Examiner

Dr. Saif Ullah\_\_\_\_\_Thesis Supervisor

Approved by

\_\_\_\_\_  
Chair of Department or Graduate Program Director

January 14, 2016

\_\_\_\_\_  
Dean of Faculty

# Why Firms Go Dark

Lingzi Zhu, MSc  
Concordia University, 2016

## **Abstract**

Since the passage of the Sarbanes–Oxley Act, regulatory compliance costs have been so burdensome for some companies that they have chosen to go dark. Go-dark firms are those that deregister from the Securities and Exchange Commission and delist from the national stock exchange market but remain public on over-the-counter (OTC) markets. This paper covers 402 US firms that went dark between April 5<sup>th</sup>, 2010 and April 5<sup>th</sup>, 2014 and finds that firms with higher leverage and audit fees are more likely to go dark, and that registration announcements have negative effects on the firms' stock price and liquidity employing logit regression and event study methodology. Most importantly, this paper introduces specific titles of the Jumpstart Our Business Startups Act, which might dramatically decrease the number of firms going dark.

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# 1. Introduction

While the general public still considers the initial public offering (IPO) an important stage in a company's life because the IPO infuses more capital into the firm and increases public awareness of it as a successful and reliable company, several researchers have investigated the benefits of going private. Private companies usually have no agency problems since their shareholders are most likely the management and directors. Periodical reports and announcements to the Securities and Exchange Commission (SEC) would also be unnecessary, and crucial business and operations information would not be exposed to potential competitors. Particularly, the Sarbanes–Oxley (SOX) Act of 2002 imposes too much regulatory burdens on registered companies, forcing many firms to reconsider staying public. (Since the passage of the SOX Act, the regulatory changes to reporting requirements have imposed substantial pressure on small firms and on enterprises that do not generate significant, free cash flow (Bushee and Leuz, 2005). This bill was enacted as a reaction to some major corporate and accounting scandals, including Enron and Worldcom, which led to stricter financial governance laws. However, according to *Business Finance*,<sup>1</sup> public company compliance costs can range from \$1 million to over \$3 million annually, even for a relatively small company with a market capitalization of less than \$50 million and total revenues of under \$100 million.)

Apart from going public or private, there exists a third option—going dark. For companies trying to avoid the debt overhang caused by leveraged buy-outs and complex and time-consuming procedures of privatization, going dark might be a better choice. Going-dark firms are those that voluntarily delist from the national security exchange market and subsequently deregister their shares from the SEC, but these shares are traded

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<sup>1</sup>For the complete article, please refer to

[https://www.dorsey.com/newsresources/publications/2009/03/going-dark--voluntary-delisting-and-deregistrati\\_\\_](https://www.dorsey.com/newsresources/publications/2009/03/going-dark--voluntary-delisting-and-deregistrati__)

on the over-the-counter (OTC) market or on pink sheets. Since the passage of the SOX Act, the compliance cost and other indirect costs have become a huge burden for small public firms that experience financial distress. Thus, some firms might opt to voluntarily delist and deregister while keeping a large investor base. From January 1, 1996 to May 31, 2004, 406 US firms had gone dark (Marosi and Massoud, 2007), and the number is still increasing. Fortunately, on April 5, 2012, US President Barack Obama passed the Jumpstart Our Business Startups (JOBS) Act, which removed some excessive regulations and rules imposed by the SOX Act. This paper investigates whether the passage of this new act would make an impact on the firms' decision to go dark. It also examines the effects of other firm-specific reasons—related to their financial situation and stock price—on this decision.

This paper hypothesizes that fewer firms would go dark after the JOBS Act, mainly because this act reduced the regulatory compliance costs. It also presumes that firms with more intangible assets, higher leverage, higher insider ownership, lower momentum and volume, and higher audit fees would more likely go dark. For the free cash flow, the combined effect is not clear. The statistical analysis and empirical results confirm most of the hypotheses; however, only the leverage and audit fee variables are significant in the logistical regression examining the probability of firms going dark. This paper also examines the deregistration announcement's effect on stock price and market liquidity and finds that the stocks of firms that have gone dark experience negative, cumulative average abnormal returns and less liquidity after deregistration.

The rest of the paper can be divided into six parts. Section 2 deals with the literature review regarding why firms go public, private, or dark and explains each specific title of the JOBS Act that influences the decision to go dark. Section 3 presents the hypotheses regarding the number of firms that have gone dark before and after the JOBS Act, the

firms' specific characteristics that influence their choices, and the impacts of deregistration on stock price and liquidity. Sections 4 and 5 describe the data and methodology used in this study. Section 6 explains the empirical results, and Section 7 draws the conclusions.

## **2. Literature Review**

### **2.1 The decision to go dark**

Why would firms opt to delist from the major stock exchange market and deregister from SEC but remain public on the OTC market? This section compares going-private, going-dark, and going-public firms and reviews the existing literature.

The differences among going-private, going-dark, and going-public firms can also be demonstrated from the following perspective. Going-private firms delist from all stock exchange markets, whether national or OTC. On the other hand, going-dark firms delist from the national stock exchange market but still trade on the OTC, whereas going-public firms can trade on the national stock exchange market and on pink sheets. Thus, to uncover the reasons behind the decision to go dark, the benefits and costs of registration and listing need to be researched. Generally speaking, stock market flotation provides firms with numerous advantages. Listed firms could obtain new sources of capital to finance new projects, make acquisitions, and mitigate debt overhang (Ransley, 1984). By doing so, not only is existing leverage reduced, but it also empowers firms to obtain further debt capital. Since the financial situations of listed firms have been improved, banks and other financial institutions would be willing to lend more money. In the event of a rising competition among suppliers of finance, public firms may be offered with diverse sources of capital on better terms (Pickens, 1987). However, if the firms persist in having high leverage issues, then these issues could not be resolved by limited public



offerings. Managers of public firms may also face the danger of losing control (Pagano et al., 1995a). Research evidence showed that the initial owners only divested 6% when their firms undertook IPOs and 1.3% more in the subsequent three years. After three years, the turnover of the controlling group was larger than normal, which implied that the IPO was actually the sale of the company (Pagano and Panetta, 1998). If the management is also the company's owner, it will try to maximize its wealth by divesting while remaining the majority control holder (Zingales, 1995). When it appears to be losing control, the management may decide to go dark as the OTC market involves fewer investors than the national stock exchange market, while providing relatively more capital sources than private firms. However, the trading volume, stock prices, and analyst coverage will likely be significantly lower for OTC markets. Additionally, if going-dark firms reach the registration limit in the future, they may need to resume publicly filing reports; at that time, the SEC regulatory landscape may change a lot, which will require significant time, effort, and money from the board of directors and the management to familiarize themselves with the new changes.

The process of going private requires the company to employ its own cash and reserves to buy out other stockholders, which may leave it in a more precarious financial situation. Evidence suggests that these firms are inefficiently managed, underleveraged, and undervalued by the market (Jensen, 1986; Kaplan, 1989a; Lehn and Poulsen, 1989; Lichtenberg and Siegel, 1990). The management and directors may sometimes also participate in this process, whether in the form of remaining shareholders or shareholders of their own company. Furthermore, the SEC needs to review all material information regarding the transaction, and after a long period of waiting, the transaction is finally completed. The whole process is complex and time-consuming.

Two important studies about this topic had been carried out. Marosi and Massoud (2007)

found that firms with fewer valuable growth opportunities, greater insider ownership, lower institutional ownership, higher leverage, and lower market momentum were more likely to go dark. With the passage of the SOX Act, the compliance cost was one of the main driving forces behind going dark. Marosi and Massoud (2007) also reported that upon the deregistration announcement, the shareholders of those firms suffered significantly negative, cumulative abnormal returns, with less liquid shares. However, in the end, Marosi and Massoud (2007) mentioned that the SEC might consider ameliorating some reporting burdens imposed on small firms. Leuz, Triantis, and Wang (2008) tried to analyze this phenomenon from two economic aspects (cost saving and agency conflict). They also pointed out that the SOX Act imposed regulatory costs on firms, and firms with a smaller size, poorer market performance, higher leverage, and fewer growth opportunities would likely go dark. On the other hand, firms that go dark would have on average larger (positive and negative) accruals relative to their cash flow from operations, larger free cash flow problems, and weaker board governance and outside monitoring, which would support the agency conflict hypothesis. This hypothesis has become more important in explaining why firms choose to go dark. This body of evidence supports the negative market reaction to deregistration announcements.

## **2.2 Jumpstart Our Business Startups (JOBS) Act**

The passage of the JOBS Act is one of the many factors that affects the deregistration decision. It contains seven titles, as follows: 1) Title I – Reopening American capital markets to emerging growth companies, 2) Title II – Access to capital for job creators, 3) Title III – Crowdfunding, 4) Title IV – Small company capital formation, 5) Title V – Private company flexibility and growth, 6) Title VI – Capital expansion, and 7) Title VII – Outreach on changes to the law. However, not all these titles affect the going-dark phenomenon, except Titles I, V, and VI. Title I defines “emerging growth companies”<sup>2</sup> as

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<sup>2</sup>If they issue more than \$1 billion in nonconvertible debt over a three-year period or become a “large

those with less than \$1 billion in total annual gross revenues in their most recent fiscal year and relieves those companies from certain regulatory and disclosure requirements, such as disclosure of executive compensation, financial disclosures and accounting pronouncements, internal control audit, and so on. On the other hand, for many firms that consider going dark, cost saving is one of their main reasons since the SOX Act imposes many burdens on these companies, especially those with limited revenues and cash flow. Thus, if firms qualify as “emerging growth companies,” as defined in the JOBS Act, they would bear less regulatory and disclosure costs and would have less motivation to go dark. Actually, the \$1-billion threshold covers plenty of firms. Titles V and VI increase the threshold requirements for deregistration only for banks and bank holding companies (deregistration is permitted for any class of securities held by fewer than 1,200 shareholders of record); no change has been made to the eligibility requirements for deregistration of a non-bank company’s class of securities under the Exchange Act. Based on Titles I, V, and VI, emerging growth companies that list for less than five years and banks and bank holding companies would be affected by the JOBS Act and in turn, go dark. Titles I, V, and VI immediately became effective upon enactment on April 5, 2012. Title III also mentions a new exemption from the requirement to register public offerings with the SEC, for certain types of small offerings, subject to several conditions, which might mitigate the registration requirements for certain companies and induce them to maintain reporting with the SEC for a longer period of time. However, this title is scheduled for October 2015, which is beyond the research period covered in this study.

Martin (2012) examined the JOBS Act mainly from the perspective of equity-based crowdfunding. The benefits of the JOBS Act outweighed its burdens since it had the potential for business development and start-up growth, which would provide numerous

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accelerated filer” under Rule 12b-2 until the fifth anniversary of their IPO, they would be withdrawn from this status.

job opportunities (Martin, 2012). Although investors might be exposed to fraudulent issuers, which would trigger confidence loss in the market, these investors would still have fundamental safeguards. Parrino and Romeo (2012) believed that the JOBS Act would assist emerging growth companies with numerous security-law concerns in the transition process from private to public firms. Both investors and companies would enjoy the broadened opportunities to access and employ capital. However, investment scams and other wrongdoings should be identified during this process. My paper reviews the JOBS Act mainly from the perspective of emerging growth companies and Title I, and there is scarce literature that focuses on this aspect.

Certainly, other factors, such as the market performance of equities and the legal environment for listing, would also have effects on the amount of going-dark firms. After the Dow Jones Industrial Average, NASDAQ Composite, and S&P 500 are checked out, it is not difficult to find that the stock performance is robust, and firms would be more willing to be or stay public. Therefore, when firms consider the strategic restructuring of their business, whether being merged and acquired or going dark, they would weigh the relative benefits and costs. The company-specific characteristics could also make a difference, which are explained for the rest of this paper.

### **3. Hypotheses**

#### **3.1 The number of going-dark firms would decrease after the JOBS Act**

*1) Fewer emerging growth companies would go dark after the JOBS Act.*

Title I of the JOBS Act eases certain regulatory and disclosure requirements for emerging companies, which motivates them to remain registered with the SEC instead of going dark. These companies would reconsider the relative benefits and costs of registration. With the removal of the regulatory burdens of the SOX Act, these firms have fewer

incentives to go dark. According to Martin (2012), emerging growth companies are exempt from certain executive pay disclosure requirements under the 1934 Act and the Investor Protection and Security Reform Act of 2010. Additionally, emerging growth companies will only present less than two years of audits in their IPO registration statements, and they are exempt from reporting “selected financial data” under Rule 301 and internal controls auditing under Section 404(b), as well as the mandatory audit firm rotation. Parrino and Romeo (2012) also mentioned that emerging growth companies and private companies would receive similar treatment in complying with new or revised financial accounting standards.

*2) More banks and BHC companies would go dark after the JOBS Act.*

Banks and bank holding companies have become easier to deregister than previously since Titles V and VI increased the threshold requirement of deregistration for these types of companies from 300 to 1,200 shareholders of record. If theoretically, the percentage of the firms going dark would not change, the number of these firms would increase since they are qualified to deregister now.

The different titles of the JOBS Act affect the going-dark phenomenon from different perspectives. The combined effects of Titles I, V, and VI would increase the number of firms going dark since the definition of emerging growth companies covers a larger portion of firms going dark compared to banks and bank holding companies. Marosi and Massoud (2007) and Leuz et al. (2008) both noticed a dramatic growth in the number of firms that went dark after the SOX Act, and they found the compliance cost and the passage of the SOX Act as among the major driving forces behind a firm’s decision to go dark.

### **3.2 The impact of firm characteristics on the decision to go dark**

*1) Smaller companies would have more incentives to go dark.*

The regulatory costs, audit fees, and indirect costs would not be as burdensome for larger companies compared to their smaller counterparts, and many of the larger firms would prefer to maintain public visibility to reassure their customers, shareholders, and other stakeholders. According to Crain and Hopkins (2001), the regulatory compliance cost was \$8,086 per employee in 2008, and the small enterprises with fewer than 20 employees were burdened with most of the regulatory costs, which were 36% higher than those of larger companies with 500 or more employees. Marosi and Massoud (2007) and Leuz et al. (2008) reported the consistent finding that smaller companies would more likely go dark.

*2) Firms with more intangible assets would more likely go dark.*

There is information asymmetry between outsiders and insiders regarding the value of intangible assets. Thus, companies with more intangible assets would more likely go dark to give better value to such assets and take advantage of the information asymmetry. If the open market would undervalue such intangible assets, managers or directors might repurchase shares or make strategic decisions to achieve their assets' underlying value. Barth and Kasznik (1999) found that firms with more intangible assets that were related to research and development and advertising were significantly more likely to repurchase shares. They also experienced positive abnormal returns during announcement periods. However, Marosi and Massoud (2007) found insignificant results regarding this hypothesis.

*3) Highly leveraged firms would more likely go dark.*

According to Healy and Palepu (2001), size, leverage, performance, and financial needs are major determinants of firms' disclosure decisions. Healy and Palepu (1990), and DeAngelo, DeAngelo, and Skinner (1996) found that highly leveraged firms were more likely to make strategic decisions. Moreover, it might be difficult for extremely high-leveraged firms to raise capital in public markets, and the management and directors might not expose their leverage information to shareholders. Marosi and Massoud (2007) and Leuz et al. (2008) confirmed this hypothesis.

*4) Companies with higher insider ownership would have more incentives to go dark.*

Higher insider ownership empowers managers and directors to have their firms go dark to reduce corporate governance costs, achieve personal goals and appropriate cash flow, or avoid public scrutiny. Marosi and Massoud (2007) reported consistent results, while Leuz et al. (2008) found that firms with less institutional ownership had a higher probability of going dark.

*5) The decision to go dark would be uncertain for companies with high free cash flow.*

Jensen (1986), Lehn and Poulsen (1989), Opler and Titman (1993), and many other scholars found that firms with higher free cash flow would more likely go private since the higher free cash flow might induce managers to invest below the capital cost and on organizational efficiencies to obtain personal benefits. The decision to go private reduces the agency costs. However, the decision to go dark does not alleviate the agency problem but exacerbates it because the firm remains less visible from outsiders. On the other hand, for cash flow expropriation reasons, firms with higher cash flow might also have incentives to go dark. Marosi and Massoud (2007) found an insignificant result regarding the free cash flow variable.

*6) Following a period of positive momentum and high liquidity, companies would less likely go dark.*

In the event of strong stock price performance and high liquidity, companies would have the option to issue new securities, instead of going dark and deregistering with the SEC. Although the JOBS Act provides a new exemption from the requirement to register public offerings with the SEC for certain types of small offerings, deregistration still eliminates most of the possibilities. Marosi and Massoud (2007) reported a significant negative relation between the momentum and the possibility of going dark, while the volume variable was insignificant.

*7) Companies with higher audit fees would more likely go dark.*

The cost of regulatory compliance is one of the main reasons why firms choose to go

dark. If most of the companies that went dark from April 5, 2010 to April 5, 2014 fulfilled the requirements of emerging growth companies (in fact, \$1 billion in total annual gross revenues included most of the start-ups and medium-sized companies), then going-dark companies would basically enjoy the exemption from governance and disclosure requirements, of which the audit fee would be one of the most measurable and significant costs. Marosi and Massoud (2007) found a positive relation between the audit fee and the possibility of going dark.

### **3.3 The impact of deregistration on stock price and market liquidity**

*1) Firms that went dark would experience negative abnormal returns.*

For shareholders and markets, the deregistration announcement might not be a positive signal as it would convey the facts about hiding important business and operations data, insiders appropriating free cash flow, or companies forced to go dark due to unsatisfactory performance. Both Marosi and Massoud (2007) and Leuz et al. (2008) found negative abnormal returns after deregistration announcements.

*2) After deregistration, the market liquidity of going-dark firms would be significantly lower than previously.*

Before deregistration, companies could trade on national stock markets with billions of investors. However, after deregistration, firms could only trade on the OTC markets, which had a limited number of investors, and because of inadequate information disclosure and the negative signal of going dark, both trading and analyst coverage would be significantly less. Marosi and Massoud (2007) found that trading liquidity was significantly reduced after going dark.

## **4. Data**

Before collecting the data about the firms that went dark before and after the JOBS Act,



the process of going dark should be clarified. There are three predicates for SEC registration under the Securities Exchange Act of 1934 before the JOBS Act, as follows:

1. if a firm has shares listed on a national securities exchange,
2. if it has over 500 record holders of a class of securities and total assets exceeding 10 million, and
3. if it has a registration statement that is declared effective under the Securities Act.

Thus, if a firm intends to go dark, first, it should file a written notice of intent, specifically, file Form 25 with the stock exchange, pursuant to Rule 12d2-2(c)(2)(ii); issue a press release; and file Form 8-K, announcing that it is delisting and going dark. Next, it should file Form 15 to deregister its shares under the Exchange Act. This deregistration will become effective in 90 days. I identified going-dark firms by manually collecting the lists of entire firms (on SEC Edgar and Mergent Online) that filed Form 15 from April 5, 2010 to April 5, 2014, which covered the period before and after the JOBS Act, including their CIK and SIC. Table 1 describes the different types of Form 15, excluding Form 15F since it concerns foreign private issuers. Form 15 contains information regarding the class of deregistered securities, remaining securities, and appropriate rule provisions relied on to suspend or terminate the duty to file reports. In this case, four types of filers should be excluded to screen going-dark firms, as follows: (1) firms that deregistered securities other than their common stock; (2) firms that deregistered their common stock but have other public securities that are still subject to public reporting requirements; (3) foreign companies (firms that filed Form 15 based on Rule 12g-4a(2)(i), 12g-4a(2)(ii), 12h-3b(2)(i), or 12h-3b(2)(ii)); and (4) firms that filed Form 15 due to mergers, acquisitions, liquidations, or bankruptcy. For the last exclusion, I used Bloomberg, Mergent Online, press releases, and announcements on the Factiva database and the firms' websites to delete these firms. After this time-intensive procedure, 402 firms were left.

*Insert Table 1*

The financial data about these companies were gathered from various sources. The total assets, total liabilities, and intangible assets came from the balance sheets included in item 8 of Form 10-K with regard to financial statements and supplementary data. The insider ownership was usually displayed in the security ownership of certain beneficial owners and management and the related stockholder matter item of Form 10-K. The audit fees were indicated in Form 10-K or proxy statements, as well as the insider ownership. The first page of Form 10-K usually documented the total shares outstanding, while item 5, the market for the registrant's common equity, related stockholder matters, and issuer purchases of equity securities recorded the historical stock prices for these companies. The free cash flow variable was measured as the operating income before taxes, interest, and depreciation, which was calculated from the income statements in item 8. I ended with 248 firms; 140 and 108 deregistered before and after the JOBS Act, respectively. Table 2 divides these companies into two groups—(1) emerging companies and (2) banks and bank holding companies. Table 2 shows that 136 emerging firms went dark before the JOBS Act, and the number decreased to 108 after the JOBS Act, which confirms hypothesis 3.1.1, that fewer emerging firms would go dark after the passage of this act. Moreover, it was due to the removal of certain compliance and reporting costs, which amplified the benefits of registration with the SEC and listing on the national stock exchange market. The number of banks and bank holding companies increased after the JOBS Act as a result of the increased threshold requirement of deregistration for these companies, which is consistent with hypothesis 3.1.2. The combined effect would be the decrease in the number of total companies that went dark before and after the JOBS Act, as verified in Table 2.

*Insert Table 2*

I matched the 248 firms on the basis of the industry classification by the Fama–French 5 industry portfolio and total assets for one year before the deregistration date to check whether they would differ in insider ownership, leverage, audit fee, momentum, and so on. The total assets, total liabilities, intangible assets, total shares outstanding, market value of equity, and free cash flow (EBITDA) of the matched companies were collected from Compustat. Their insider ownership information was manually collected from item 12 of Form 10-K, and the audit fee information mainly came from the AuditAnalytics database. The stock price information and trading volumes were gathered from Datastream. The total sample consisted of 186 firms.

Table 3 exhibits the statistical analysis of the original firms and the matched firms and examines whether there is a significant difference between these two samples. Table 3 shows that the audit fees of the going-dark firms are significantly higher than those of the matched firms, which is consistent with my hypothesis 3.2.7 that firms would go dark due to burdensome regulatory costs although the absolute amount of the firms that went dark decreased during the four-year period of my study. Since the control sample is matched on the basis of size, there should be no difference between the total assets of the original sample and the matched sample. The leverage of the going-dark sample is on average higher than that of the control sample, which once again confirms hypothesis 3.2.3. Firms with higher leverage tend to go dark because they prefer to make strategic decisions, may be unable to raise capital in the main public markets due to their high leverage, or simply do not want to share their leverage information with shareholders and other stakeholders. For intangible assets and momentum, their magnitude in the original sample and the matched sample is also in accordance with other hypotheses although there are no significant differences between them. Firms with more intangible assets opt to go dark to give a better value to such assets and probably to appropriate their own benefits. When the momentum is low, firms also tend to go dark, considering the fewer

*Insert Table 3*

opportunities for public offering. However, there are no obvious differences between insider ownership and volume.

The original sample is also divided into two subsamples—comprising before and after the JOBS Act. Table 4 presents the statistical analysis results for these two subsamples. T statistics measure the differences between them. Table 4 shows no significant differences among the various variables of the two subsamples. In other words, the audit fees of the firms that went dark before the JOBS Act exhibit no differences from those of the firms that went dark after the JOBS Act. The possible explanation is that the firms enjoying the benefits of reduced audit fees and regulatory compliance costs choose not to go dark, while for the firms that insist on going dark, the audit fees remain relatively high and exhibit no major difference from those of the firms that went dark before the JOBS Act. For the size variable, there is a slight difference between the two subsamples.

*Insert Table 4*

The firms that went dark before the JOBS Act possess more total assets than the firms that went dark after the JOBS Act, which could be attributed to the decreased number of large firms as they are more capable of dealing with regulatory compliance costs than previously. Table 5 displays the correlation between each two variables; it can be concluded that there is no high correlation between them. The coefficient equals 1(-1) if the independent variables are totally positively (negatively) related.

*Insert Table 5*

## 5. Methodology

### 5.1 The decision to go dark

Many factors influence the decision to go dark, such as the passage of certain acts, the change in an international economic situation, or the cycle of industrial booms and slumps. These factors will eventually affect each specific firm, which will be reflected in its financial statements and stock price. In this study, I therefore checked whether the decision to go dark would have connections with the financial information variable, stock price variables, and more importantly, the regulatory compliance cost of the JOBS Act, measured by the audit fee. The model is as follows:

$$Y = \alpha + \beta_1 SIZE + \beta_2 INTAN + \beta_3 LEV + \beta_4 IO + \beta_5 FCF + \beta_6 M + \beta_7 V + \beta_8 AF + \varepsilon,$$

where

$Y$  equals 1 if the firm goes dark; otherwise, it equals 0;

$SIZE$  is the firm's total asset;

$INTAN$  means the intangible asset ratio, which indicates the intangible asset divided by the total asset;

$LEV$  is the leverage ratio, which denotes the total liabilities divided by the total asset;

$IO$  represents the security ownership ratio by all current executive officers and directors;

$FCF$  signifies the free cash flow divided by the market value of the asset;

$M$  is defined as the buy-and-hold market-adjusted returns;

$V$  means the average daily trading volume divided by the total shares outstanding; and

$AF$  is the log of the annual audit fee.

### 5.2 The impact of deregistration announcement on stockholders

In this section, the event study methodology is employed to check whether the deregistration announcement would make an impact on the stock price. The market model is used to calculate estimated returns. The coefficients are estimated based on the

estimation period, (-290, -46), in which the deregistration filing date on Edgar is regarded as day 0. The model is as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it},$$

where

$R_{it}$  is the return of security  $i$  on time  $t$ , and

$R_{mt}$  is the market return on time  $t$ , which is measured by using TOTMKUS in Datastream.

The abnormal return is the actual return subtracted by the estimated return of security  $i$ , and the calculations of the average abnormal return ( $AAR$ ) and the cumulative average abnormal return ( $CAAR$ ) are shown below:

$$AAR_t = \frac{1}{N_t} \sum_{i=1}^{N_t} AR_{it},$$

where  $AR_{it}$  is the abnormal return of security  $i$  at time  $t$ , while  $N_t$  is the number of securities at time  $t$ .

$$CAAR_{t_1}^{t_2} = \sum_{t=t_1}^{t_2} AAR_t,$$

where the event period is between  $t_1$  and  $t_2$ . The calculations of the test statistics, including the  $t$  and  $p$  values, are also based on MacKinlay's (1997) work.

### 5.3 The impact of deregistration on liquidity<sup>3</sup>

Apart from the impact on the stock price, I also checked whether deregistration would influence stock liquidity. The three measures of market liquidity are turnover, volatility, and trading days. These three measures are calculated for two periods—before deregistration (-90, -31) and after deregistration (31, 90). The days in between are excluded to rule out the noises of deregistration announcements. And the description

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<sup>3</sup>Please refer to the same methodology by Marosi and Massoud (2007).

about variables used in the methodology is displayed in table 6.

*Insert Table 6*

## **6. Empirical Results**

Table 7 checks whether the basic characteristics of go-dark firms are influenced by the implementation of the JOBS Act. The data section has shown that the number of firms that went dark is significantly fewer after the JOBS Act as a result of the reduction in regulatory costs. However, after the regression results are checked (Table 7), the audit fees of the firms that went dark exhibit no significant differences before and after the JOBS Act. The reason is that the firms that have suffered from a certain level of regulatory burdens would choose to go dark, while those firms that have enjoyed the benefits of the JOBS Act and have reduced their regulatory compliance costs would remain registered. Thus, for firms that still intend to go dark, the audit fees would have no significant difference from other firms that went dark, no matter whether they did so before or after the JOBS Act.

*Insert Table 7*

Tables 8, 9, and 10 present the empirical results of the logit regression concerning the possibility of going dark and the impact of deregistration announcements on stock price and market liquidity. Table 8 incorporates eight models, with the first model solely including the audit fee variable. Each time, I add one more variable till the model includes all financial and stock price variables. Table 8 shows that the audit fee variable remains significant through all those eight models, and the significance level keeps increasing till model 8; the audit fee variable is significant at the 1% level. Therefore, the

regulatory compliance cost is indeed a crucial factor behind the decision to go dark. The other significant variable is leverage, at the 5% significance level. It demonstrates that firms with higher leverage are more willing to go dark. The reasons are that either they could not raise enough capital in the national stock exchange market due to their overly high leverage, or they prefer not to expose relevant information to shareholders and the public, in case these stakeholders view them as financially unhealthy firms. The coefficient of the free cash flow variable is negative, which means that firms with more free cash flow are more likely to stay registered with the SEC. It makes sense since going dark would not resolve agency problems but exacerbate them, especially when the free cash flow is high, and the agency cost is possibly relatively higher. The other variables are insignificant at any level.

*Insert Table 8*

Tables 9 and 10 report the impact of deregistration announcements on stock price and market liquidity. For the stock price effect, I checked seven event windows, as follows: (0, 0), (0, +1), (0, +2), (0, +4), (0, +5), (0, +10), and (0, +15). The cumulative average abnormal returns remain significant during all these event windows. On the event date, the influence of the deregistration announcement does not reflect on the stock price so much as in other periods; however, it is robust enough to demonstrate that going-dark firms experience negative abnormal returns as soon as they file Form 15 for deregistration on the SEC. Half a month after the announcement, the cumulative abnormal return is as high as 28.28% compared with 1.77% during the first day. Table 10 exhibits the mean, standard deviation, maximum and minimum values of pre-deregistration and post-deregistration turnover, volatility, and trading days for the original sample and the matched sample. These three measures of market liquidity are all significant, which implies that pre-deregistration liquidity and post-deregistration



liquidity are significantly different for both the original and the matched samples. However, the significance conveys different information. For the original sample, pre-deregistration turnover and trading days are obviously higher than those of the post-deregistration period, while pre-deregistration volatility is lower than that of the post-deregistration period, indicating that market liquidity is decreased and investment risk is increased after going dark. For the matched sample, pre-deregistration turnover and trading days are obviously lower compared to those of the post-deregistration period, while pre-deregistration volatility is lower than that of the post-deregistration period, indicating that generally, market liquidity is increased. Although the pre-deregistration volatility is lower than that of the post-deregistration period, the mean difference is only 0.088. Compared with 0.126 of the original firms, the volatility is also relatively lower.

*Insert Table 9 and Table 10*

## **7. Conclusion**

On April 5, 2012, President Obama signed the JOBS Act into law; in the same year, Titles I, V, and VI became immediately effective upon enactment. Title I defines emerging growth companies and relieves them from the burdensome regulations and rules imposed by the SOX Act. Titles V and VI increased the deregistration threshold to 1,200 shareholders of record for banks and bank holding companies, making it easier for these companies to deregister. However, since emerging growth companies comprise a large majority, the combined effect is the decrease in the number of deregistered firms.

As mentioned, going-dark firms are those that delist from national stock exchange markets and deregister from the SEC but remain trading on OTC markets. Since

deregistration is the last step of going dark, I collected the list of firms that filed Form 15 for the purpose of deregistration, excluding mergers and acquisitions, liquidations, and so on. Financial information regarding the firms' size, intangible assets, leverage, insider ownership, and audit fees, as well as stock price information regarding momentum and volume, were collected to check whether the decision to go dark would have interactions with these factors. The results show that firms with higher audit fees and higher leverage are significantly more likely to go dark. These findings indicate that firms go dark because they cannot bear the enormous regulatory costs and may wish to hide their disadvantageous leverage information for fear of adversely influencing the stock price and public awareness. Checking the deregistration announcement's effect on stock price and market liquidity reveals that outsider shareholders suffer from negative, cumulative average abnormal returns and significantly decreased market liquidity. These can be due to the negative signal of going dark that is sent to public markets and the limitations of OTC markets.

## 8. References

1. Barth M E, Kasznik R. Share repurchases and intangible assets [J]. *Journal of Accounting and Economics*, 1999, 28(2): 211–241.
2. Bushee B J, Leuz C. Economic consequences of SEC disclosure regulation: Evidence from the OTC bulletin board [J]. *Journal of Accounting and Economics*, 2005, 39(2): 233–264.
3. Crain W M, Hopkins T D. The impact of regulatory costs on small firms [M]. US Small Business Administration, Office of Advocacy, 2001.
4. DeAngelo H, DeAngelo L, Skinner D J. Reversal of fortune dividend signaling and the disappearance of sustained earnings growth [J]. *Journal of Financial Economics*, 1996, 40(3): 341–371.
5. Healy P M, Kang S H, Palepu K G. The effect of accounting procedure changes on CEOs' cash salary and bonus compensation [J]. *Journal of Accounting and Economics*, 1987, 9(1): 7–34.
6. Healy P M, Palepu K G. Earnings and risk changes surrounding primary stock offers [J]. *Journal of Accounting Research*, 1990: 25–48.
7. Healy P M, Palepu K G. Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature [J]. *Journal of Accounting and Economics*, 2001, 31(1): 405–440.
8. Jensen M C. Agency cost of free cash flow, corporate finance, and takeovers [J]. Corporate finance and takeovers. *American Economic Review*, 1986, 76(2).
9. Kaplan S. The effects of management buyouts on operating performance and value [J]. *Journal of Financial Economics*, 1989, 24(2): 217–254.
10. Lehn K, Poulsen A. Free cash flow and stockholder gains in going private transactions [J]. *Journal of Finance*, 1989, 44(3): 771–787.
11. Leuz C, Triantis A, Wang T Y. Why do firms go dark? Causes and economic consequences of voluntary SEC deregistrations [J]. *Journal of Accounting and Economics*, 2008, 45(2): 181–208.
12. Lichtenberg F R, Siegel D. The effects of leveraged buyouts on productivity and related aspects of firm behaviour [J]. *Journal of Financial Economics*, 1990, 27(1): 165–194.

13. Marosi A, Massoud N. Why do firms go dark? [J]. *Journal of Financial and Quantitative Analysis*, 2007, 42(02): 421–442.
14. Martin T A. The JOBS Act of 2012: Balancing fundamental securities law principles with the demands of the crowd [J]. Available at SSRN 2040953, 2012.
15. Opler T, Titman S. The determinants of leveraged buyout activity: Free cash flow vs. financial distress costs [J]. *Journal of Finance*, 1993: 1985–1999.
16. Pagano M, Panetta F. Why do companies go public? An empirical analysis [J]. *Journal of Finance*, 1998, 53(1): 27–64.
17. Pagano M, Panetta F, Zingales L. The stock market as a source of capital: Some lessons from initial public offerings in Italy [J]. *European Economic Review*, 1996, 40(3): 1057–1069.
18. Parrino R J, Romeo P J. JOBS Act eases securities-law regulation of smaller companies [J]. *Journal of Investment Compliance*, 2012, 13(3): 27–35.
19. Ransley R D. A research project into the operation and development of the unlisted securities market 1980–1984. Unpublished, London Business School, London, 1984.
20. Zingales L. Insider ownership and the decision to go public [J]. *The Review of Economic Studies*, 1995, 62(3): 425–448.

**Table 1: Description of different SEC forms**

This table displays related SEC forms. Forms 15 and 15F were reviewed during the preliminary data collection process, while Forms 10-K and DEF 14A were referred to when searching for financial information about the firms that went dark.

<b>Form type</b>	<b>Description</b>
Form 15-12b	Termination of registration of a class of security under Section 12(g) or notice of suspension of duty to file reports under Sections 13 and 15(d) of the 1934 Securities Exchange Act Section 12(b). Section 12(b) requires issuers to provide pertinent financial data when they register securities with the SEC, including information on the corporate structure, management compensation, balance sheets, and so on.
Form 15-12g	Termination of registration of a class of security under Section 12(g) or notice of suspension of duty to file reports under Sections 13 and 15(d) of the 1934 Securities Exchange Act Section 12(g). Section 12(g) deals with issuers that are exempted from normal filing requirements.
Form 15-15d	Termination of registration of a class of security under Section 12(g) or notice of suspension of duty to file reports under Sections 13 and 15(d) of the 1934 Securities Exchange Act Sections 13 and 15(d). Sections 13 and 15(d) require the filing of periodic documents, reports, and information related to the securities registered pursuant to Section 12 of the 1934 Securities Exchange Act.
Form 15F	Certification of a foreign private issuer and termination of registration. The foreign companies either revoke the registration of securities or fail to meet certain filing requirements so that Form 15F is used to notify the SEC and investors. It includes Forms 15F-12b, 15F-12g, and 15F-12d.
Form 10-K	A comprehensive annual summary of a company's performance, including the company history, organizational structure, balance sheets, subsidiaries, and so on. Form 10-Q contains quarterly reports.
DEF 14A	Definitive proxy statement required when soliciting shareholder votes. This statement contains information about the management and the directors' compensation and potential conflicts of interest.

\*Usually, Form 15 would also include Forms 15-12b(a), 15-12g(a), and 15-15d(a), which were amendments.

**Table 2: Number of different firms that went dark**

This table displays the number of different firms (emerging companies and banks and bank holding companies [BHCs]) that went dark before or after the JOBS Act. Based on the JOBS Act, the emerging companies are defined as those with less than \$1 billion in total annual gross revenues in their most recent fiscal year. The banks and the BHCs are firms with SIC codes classified in the Fama–French 49 industry portfolios.

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Before JOBS Act: 140	Emerging companies: 136
	Banks and BHCs: 12
After JOBS Act: 108	Emerging companies: 108
	Banks and BHCs: 18

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**Table 3: Descriptive statistics of total sample**

This table displays the summary statistics of firms that went dark and matched firms. Panel A reports the mean, median, standard deviation, maximum and minimum of company size, intangible asset ratio, leverage, insider ownership, free cash flow ratio, momentum, volume, and audit fee of firms that went dark. Panel B reports the firms' characteristics that matched on the basis of industry and size. \*, \*\*, \*\*\* indicate significance level at 10%, 5%, and 1%, respectively.

	Size	Intangible asset	Leverage	Insider ownership	Free cash flow	Momentum	Volume	Audit fee
Panel A: Going-dark								
Mean	1.38	0.44	34.05	0.32	-0.10	-0.07	0.38	4.98
Median	0.05	0.00	0.96	0.28	-0.06	-0.20	0.11	4.95
Std	2.81	3.36	167.44	0.25	0.24	0.73	0.71	0.58
Min	0.00	0.00	0.01	0.00	-1.86	-0.91	0.00	3.00
Max	17.38	32.46	1364.12	0.90	0.23	2.00	3.38	6.30
Panel B: Control sample								
Mean	1.42	0.06	7.23	0.32	-0.07	0.06	0.33	4.80
Median	0.05	0.00	0.28	0.27	-0.04	-0.16	0.07	4.86
Std	2.77	0.37	23.12	0.22	0.21	0.86	1.49	0.40
Min	0.00	0.00	0.00	0.01	-1.14	-0.75	0.00	4.00
Max	14.78	3.53	125.00	0.82	0.51	3.26	13.85	5.60
T test	0.11	-1.07	-1.53	0.04	1.03	1.11	-0.30	-2.39***

**Table 4: Descriptive statistics of firms that went dark**

This table displays the summary statistics of firms that went dark before and after the JOBS Act. Panel A reports the mean, median, standard deviation, maximum and minimum of company size, intangible asset ratio, leverage, insider ownership, free cash flow ratio, momentum, volume, and audit fee of firms that went dark before April 5, 2012. Panel B reports the characteristics of firms that went dark after that date. Two ways to calculate the t test—pooled and satterthwaite—are used to determine whether there are significant differences between the characteristics of the firms that went dark before and after the JOBS Act. Due to the sample size difference, the two t test results differ. \*, \*\*, \*\*\* indicate significance level at 10%, 5%, and 1%, respectively.

	Size	Intangible asset	Leverage	Insider ownership	Free cash flow	Momentum	Volume	Audit fee
Panel A: Before JOBS Act								
Mean	1.67	0.73	51.73	0.29	-0.07	-0.17	0.49	4.97
Median	0.07	0.00	0.90	0.26	-0.02	-0.22	0.11	4.97
Std	3.37	4.54	221.63	0.23	0.15	0.61	0.88	0.64
Min	0.00	0.00	0.01	0.00	-0.52	-0.91	0.00	3.00
Max	17.38	32.46	1364.12	0.90	0.23	2.00	3.38	6.30
Panel B: After JOBS Act								
Mean	1.02	0.08	12.59	0.35	-0.15	0.05	0.25	4.98
Median	0.04	0.00	0.98	0.30	-0.07	-0.18	0.10	4.93
Std	1.92	0.17	46.31	0.26	0.32	0.84	0.42	0.51
Min	0.00	0.00	0.05	0.01	-1.86	-0.91	0.00	3.65
Max	8.96	0.67	292.75	0.89	0.16	2.00	2.25	6.18
T test (pooled)	-1.12	-0.93	-1.12	1.07	-1.60	1.46	-1.61	0.04
T test (satterthwaite)	-1.17	-1.03	-1.23	1.06	-1.50	1.42	-1.70	0.05



**Table 5: Correlation matrix**

This table reports the correlation relations between independent variables. The numbers under those columns measure the correlation coefficients ranging from [-1, 1]. -1 to 1 mean totally negative and positively related specifically, while 0 signifies no relations between two variables.

	Size	Leverage	Intangible asset	Insider ownership	Audit fee	Free cash flow	Momentum	Volume
Leverage	-0.08	0.49						
Intangible asset	-0.05	-0.06	-0.04					
Insider ownership	-0.17	-0.2	0.09	-0.11				
Audit fee	0.41	0.02	0.03	-0.02	0.16			
Free cash flow	0.24	0.02	0.03	-0.02	-0.03	0.01		
Momentum	0	-0.1	-0.06	0.02	0.05	-0.3	0	
Volume	-0.02	-0.01	0	-0.1	0.05	-0.3	0	0

## Table 6: Logit variable and market liquidity variable index

This table shows the logit variables used in logit regression and the market liquidity variables used in examining the impact of deregistration on stock liquidity. The descriptions of these variables include detailed calculation methods, the data source, and so on.

<i>Panel A: Logit variables</i>	
<u>Variables</u>	<u>Description</u>
Binary	The dependent variable equals 1 for firms that chose to go dark and 0 for matching firms. The deregistered firms were matched based on two criteria, as follows: i) industry classification by Fama–French 5 industry portfolio and ii) total asset one year before deregistration.
Size	The firm’s total asset value
Intangible asset ratio	The ratio of the firm’s intangible assets to total assets
Leverage	Leverage is calculated as the ratio of total liabilities to total assets.
Insider ownership	It is the ratio of holdings of common shares by all directors and officers as a group to total outstanding shares. The insider ownership ratio was manually collected from proxy statements or from Form 10k from the EDGAR database.
Audit fees ratio	It is measured by the log of annual audit fees paid by a firm for certifying its financial reports. The annual audit fee data were collected from the Audit Analytics database.
Free cash flow ratio	Based on Opler and Titman (1993), free cash flow is measured as operating income before taxes, interest, and depreciation (EBITDA). Free cash flow ratio is EBITDA divided by market value of assets.
Momentum	Based on Loughran and Ritter (1996), we define momentum as buy-and-hold market-adjusted returns for the $j$ th firm in our sample, as follows:  $BHMAR_{j,T-150,T-31} = [\Pi_{T-150}^{T-31}(1 + R_{jt})] - [\Pi_{T-150}^{T-31}(1 + R_{mt})],$ where $T_{-150}$ and $T_{-31}$ are the first and the last trading days, including those in the holding period, to calculate buy and hold returns; $R_{jt}$ is the daily return for sample firm $j$ on date $t$ , and $R_{mt}$ is the market return on the same date.
Volume	It is the ratio of average daily trading volume over a period of 150 trading days to total outstanding shares. The turnover is computed in the pre-deregistration period (-150, -31).

**Table 6 (continued)***Panel A: Market liquidity variables*

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<u>Variables</u>	<u>Description</u>
Mean volatility	It is the standard deviation of the daily returns of stocks divided by 60 trading days.
Volume (turnover)	It is measured by trading volume over total shares outstanding multiplied by 60 trading days.
Trading days	The number of days that firms' stocks are traded, divided by 60 trading days.

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**Table 7: Partial impact of JOBS Act on go-dark firms**

This table displays the regression results of the partial impact of the JOBS Act on go-dark firms. The dependent variable takes a value of 1 if the firms went dark before the JOBS Act; otherwise, it takes a value of 0. The independent variables are the financial and stock price variables, which reflect the characteristics of go-dark firms.

Variables	Parameter (P-value)	Variables	Parameter (P-value)
Intercept	0.77 (0.15)	Audit fee	-0.51 (0.63)
Size	0.17 (0.45)	Free cash flow	0.24 (0.27)
Intangible assets	0.01 (0.55)	Momentum	-0.12 (0.12)
Leverage	0.17 (0.66)	Volume	0.10 (0.20)
Insider ownership	-0.13 (0.56)		
N			93
Adj. R-Sq			0.02

**Table 8: Logit regression of the probability to go dark**

This table displays the logit regression results of eight models. It examines whether the decision to go dark would have relations with intangible assets, leverage, insider ownership, free cash flow, momentum, volume, and audit fee. The first model solely includes audit fee variables, and then, one more variable is added each time till the model includes all financial and stock price variables. \*, \*\*, \*\*\* indicate significance level at 10%, 5%, and 1%, respectively.

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Constant	-0.37(0.31)	-0.53(0.17)	-0.50(0.20)	-0.72(0.07)	-0.73(0.07)	-0.80(0.06)	-0.78(0.06)*	-0.79(0.06)*
Size		-0.17(0.25)	-0.16(0.28)	-0.17(0.24)	-0.17(0.25)	-0.13(0.39)	-0.13(0.40)	-0.13(0.40)
Intangible asset ratio			0.12(0.44)	-0.07(0.71)	-0.07(0.72)	-0.06(0.73)	-0.06(0.72)	-0.06(0.72)
Leverage				0.71(0.05)**	0.71(0.05)**	0.74(0.04)**	0.71(0.05)**	0.71(0.05)**
Insider ownership					0.48(0.98)	0.95(0.95)	1.04(0.95)	0.59(0.97)
Free cash flow ratio						-0.23(0.17)	-0.23(0.17)	-0.24(0.17)
Momentum							-0.38(0.42)	-0.37(0.42)
Volume								-0.86(0.80)
Audit fee	0.18(0.02)**	0.21(0.00)***	0.21(0.01)***	0.25(0.00)***	0.25(0.00)***	0.26(0.00)***	0.26(0.00)***	0.26(0.00)***
Adj R-Sq	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.03

**Table 9: Impact of deregistration on stock price**

This table displays the event study results of the impact of deregistration on stock price. It calculates the cumulative average abnormal returns for seven periods (0, 0), (0, +1), (0, +2), (0, +4), (0, +5), (0, +10), (0, +15). The estimation period and methodology are given in the methodology section.

	(0, 0)	(0, +1)	(0, +2)	(0, +4)	(0, +5)	(0, +10)	(0, +15)
<b>Pr &gt;  t </b>	0.0094	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
<b>t Value</b>	-2.66	-4.85	-5.76	-6.28	-6.63	-6.62	-6.61
<b>Std Err</b>	0.00667	0.00948	0.0126	0.017	0.0197	0.0281	0.0428
<b>CAAR</b>	-0.0177	-0.046	-0.0725	-0.107	-0.1303	-0.1858	-0.2828
<b>N</b>	91	91	91	91	91	91	91
<b>Event Window</b>	(0, 0)	(0, +1)	(0, +2)	(0, +4)	(0, +5)	(0, +10)	(0, +15)

**Table 10: Impact of deregistration on market liquidity**

This table shows the statistics of three measures of market liquidity, turnover, trading days and volatility over pre-registration and post-registration periods. It is also divided into the original sample and the matched sample. The mean liquidity differences between pre-registration and post-registration periods and between the original and the matched samples can be compared. \*, \*\*, \*\*\* indicate significance level at 10%, 5%, and 1%, respectively.

Variable	N	Pre-Registration				Post-Registration				Mean Pair Difference	
		Mean	Std Dev	Minimum	Maximum	Mean	Std Dev	Minimum	Maximum	Difference	t-value
<b>Sample</b>											
Turnover	91	0.38	0.69	0	2.55	0.08	0.11	0	0.43	-0.30***	4.09
Trading Days	91	33.34	19.24	0	57	18.21	19.44	0	58	-15.13***	6.54
Volatility	91	0.008	0.019	-0.014	0.062	0.133	0.181	0	0.662	0.126***	6.62
<b>Matched</b>											
Turnover	92	0.12	0.15	0	0.58	0.17	0.24	0	0.98	0.04**	2.23
Trading Days	92	38.9	17.46	0	57	42.37	17.96	2	59	3.47***	3.11
Volatility	93	0.007	0.014	-0.004	0.053	0.095	0.066	0.016	0.23	0.088***	13.6

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