The Effect of Option Listing on Financing Decisions

Eunpyo Hong*, Min C. Park†, Tao-Hsien Dolly King‡

October 25, 2020

Abstract

This paper investigates the effect of option listing on corporate financing decisions. Firms experience a significant drop in leverage, which is mainly driven by an increase in equity issues. This effect is concentrated in firms with low profitability, high information asymmetry and active option trading. Following the option listing, newly listed firms hold more cash and engage in more acquisitions which are mainly funded by new equity issues. These findings suggest that option listing has a significant impact on financing decisions due to lower information asymmetry and that firms use the post-listing equity to build up financial slack and support a larger investment set.

Keywords: option listing, capital structure, information asymmetry, market timing

JEL classification: G30, G32, G34

Declarations of interest: none

*The George Washington University, Department of Finance, Funger Hall Suite, 2201 G Street NW, Washington DC 20052, United States. E-mail:eunpyohong@gwu.edu

†Alabama State University, Department of Finance, 915 S Jackson St, Montgomery, AL 36104, United States. E-mail: mpark@alasu.edu

‡The University of North Carolina at Charlotte, Department of Finance, 9201 University City Blvd.Charlotte, NC 28223, United States. E-mail: tking3@uncc.edu

1. Introduction

Prior literature shows that option listing reduces information asymmetry by more analysts following (Skinner, 1990), greater media coverage (Damodaran and Lim, 1991), and thus a lower cost of equity (Naiker, Navissi, and Truong, 2013). A related stream of papers also presents more active option trading is associated with a decrease in the cost of debt (Do, Truong, and Vu, 2019; Cao et al., 2019). These empirical studies lead to an important question of whether and how an option listing affects firm's capital structure, which has not been explored in the literature.

This research question is interesting in two ways. First, there is a debate on the effect of option listing on the information environment in the financial markets. Based on the theoretical foundation in Easley, O'Hara, and Srinivas (1998), the empirical papers show that option prices contain information which is not yet incorporated into the underlying stock prices, and that option prices can predict stock returns. Also, option order flow contains an important informative component about future stock price movement that is not found in the trading activities of pure stock investors (Chakravarty, Guien, and Mayhew, 2004; Johnson and So, 2012; Hu, 2014; and Ge, Lin, and Pearson, 2016).[1] In contrast, some researchers argue that option trading does not improve information discovery. For example, Fedenia and Grammatikos (1992), Wei, Poon, and Zee (1997), and Heer, Trede, and Wahrenburg (1997) show that option trading increases the price volatility of the underlying stock and the bid-ask spread, but does not necessarily convey new information.[2] More recently, Muravyev and Pearson (2016) present direct evidence that option prices do not contain information about future stock prices beyond what is already reflected in current stock prices. Second, given the previous literature, a direction of leverage following option listing is not straightforward. On the one hand, recent

[1] Among many papers, Hu (2014) shows that although option trading generates only a small proportion of the total stock order imbalance, it contains most of the predictive information about permanent stock price changes.

[2] Stephan and Whaley (1990) find that the stock market leads the option market, suggesting that information inferred from option trades may originate from stock trades. Vijh (1990) finds that the price effects of large option trades are generally small, suggesting that option trades are not information-related

papers show a decrease in the level of information asymmetry and cost of equity (Hu, 2018; Naiker, Navissi, and Truong, 2013). These previous studies would enable us to infer that there would be a decrease in leverage, given that managers can time equity issues when share prices of their companies are overvalued (Baker and Wurgler, 2002). On the other hand, firms may also consider debt issuances after option listing to secure a lower cost of debt. For example, Do, Truong, and Vu (2019) show a reduction in both quantitative (e.g., bank loan spread) and qualitative cost (e.g., covenant strictness) as option trading volume increases.[3] Therefore, the impact of option listing on leverage is driven by firms' choice of financing sources. Given option listing is associated with a lower cost of equity and a lower cost of debt, firms would have a lower (higher) leverage if they decide to issue more (less) equity than debt.

In this paper, we investigate whether and how firms' financing decisions are affected by option listing using newly listed firms to the option market. As the literature has shown that option listing leads to a reduction in information asymmetry, we expect a decrease in leverage due to a positive link between information asymmetry and leverage suggested by the pecking order theory (Myers and Majluf, 1984; Bharath, Pasquariello, and Wu, 2009; Chang, Dasgupta, and Hilary, 2006). In other words, option listings lead to lower information asymmetry, which then result in a decrease in leverage. To empirically explore the impacts of option listings on corporate capital structure, we examine the changes in capital structure of non-financial firms using a 11-year window (five years before and six years after) around option listing events from 1999–2017.[4] We find that newly listed firms experience a significant decrease in leverage. For a typical firm, the average drop in leverage is about 5% after its options are listed on an exchange.

[3]Similarly, Cao et al. (2019) provide a less strict covenant restrictions for firms with optionable stocks as option trading volume increases.

[4]We exclude the year before the option listing (T=-1) because of the 'Ashenfelter dip' that the treatment group experiences a dip before getting treated. In our setting, firms have strong incentives to be listed on the option market due to the benefits of listing (e.g., more analyst and/or news coverage, lower costs of capital, greater innovation and investment activities) as the literature has shown. Consequently, firms may decrease their leverage before the option listing to boost the possibility of being listed as we observed in Figure 2 (see Hong et al. (2020) for findings of the S&P 500 index addition events). If this is the case, our setting can be sensitive to the Ashenfelter dip, which overstates the impact of option listing on capital structure in the before-after comparisons as Heckman and Smith (1999) warn. Although we used the eligibility conditions to minimize this problem, we believe that this approach will further lessen the possible overestimation of the impact of option listing on capital structure. Our results remain robust when we include the year before the option listing.

The listing effect on leverage is statistically and economically significant and is robust across various model specifications and controls. A decrease in market (book) leverage following an option listing event can explain about 12% (9%) of the standard deviation of market (book) leverage. Our findings are consistent with a positive relation between information asymmetry and leverage as suggested by the pecking order theory (Bharath, Pasquariello, and Wu, 2009; Chang, Dasgupta, and Hilar, 2006).

Next, we examine whether the change in leverage is driven by new equity and/or new debt issues in the post-listing period. Previous literature suggests that option listing leads to a lower cost of equity and cost of debt due to reduced information asymmetry (Naiker et al, 2013; Do, Truong, and Vu, 2019; Cao, et al. 2019). These studies provide empirical support for the theoretical arguments of Easley, O'Hara, and Srinivas (1998) and are consistent with the findings of Easley and O'Hara (2004) and Lambert, Leuz, and Verrecchia (2007). Market timing argument indicates that firms are likely to issue more equity and debt in the post-listing period (Graham and Harvey 2001; Baker and Wurgler, 2002; Baker, Greenwood, and Wurgler, 2003). The pecking order theory further suggests that firms issue stock during periods of low information asymmetry to build up cash reserves or financial slack, implying more equity than debt issues (Myers and Majluf, 1984). Based on the above discussion, we conjecture that newly listed firms are likely to issue more equity than debt issues. Consistent with our prediction, we find that newly listed firms experience a significant increase in net equity issue but no significant changes in net debt issue after the option listing. This result provides support for the market timing and pecking order explanations.

We consider the possible endogeneity that option listing may be affected by certain unobservable factors that may also influence firm's capital structure decisions. To address this issue, we use the Instrumental Variable (IV) approach and the Difference-in-Difference approach. In the IV model, we follow Cohen, Frazzini, and Malloy (2008) and use the educational connection of managers or board directors working in the candidate firms as an instrument of option listing following. The conjecture is that if a candidate company has connections with the Chicago

Board Options Exchange (Cboe) managers/directors, then it is more likely to be listed on the option market. The education connection between the managers or directors of the candidate firms and those at the Cboe is irrelevant to the capital structure decisions of the candidate firms. In the Difference-in-Difference approach, we compare the difference in leverage and financing sources before and after the option listing in the form of panel regressions with fixed effects. We use two matching methods to match the treatment firms to control firms in addition to applying eligibility conditions: the portfolio matching method and the propensity score matching method. The IV model and Difference-in-Difference results yield results that are consistent with the main finding of a decrease in leverage driven by more equity issues following option listings.

Next, we study the channels through which information asymmetry is reduced after the option listing and therefore help explain the link between option listing and leverage. Based on the literature of index listing, we conjecture that option listing (or trading) leads to a reduction in information asymmetry in three ways. First, an increase in investor interests as a result of option listing leads to greater information production by closer monitoring by institutional investors and analysts. Literature shows an increase in the number of analysts following, institutional holdings, and news coverage after option listing (Skinner, 1990; Damodaran and Lim, 1991; Ho, 1993). Firms with a lower level of information production prior to the option listing are expected to benefit more from the increase in information production. Thus, we expect a stronger effect of option listing on leverage and financing decision for these firms. Second, active option trading reflects better information environment as option trading volume proxies for the extent of informed traders' participation and the richness of the information environment (Hegde and McDermott, 2003; Chordia, Roll, and Subrahmanyam, 2001). We expect that option listing should have a more prominent impact on leverage for newly listed firms with a larger trading volume. Third, Chen, Noronha, and Singal (2004) suggest that investor awareness can explain the positive price reactions to S&P 500 Index inclusions because more investors become aware of the stocks added to the index. We expect that option listing

broadens investor awareness of the stock and thus increases the extent of the ownership. A drop in information asymmetry is partially driven by a smaller shadow cost (Merton, 1987; Chen, Noronha, and Singal, 2004). Consistent with our predictions, we find that the effect of option listing on capital structure is more pronounced among firms with a lower level of information production prior to option listing, or firms with a greater option trading volume. However, we find little support for the investor awareness explanation because the findings of a drop in leverage and an increase in net equity issue become reversed after firms are delisted. These results indicate that the effect of option listing on financing decisions can be explained by greater information production and improved information environment.

Lastly, we study firms' cash holding and investment activities after option listing. The precautionary saving theory suggests that firms with small size or low profitability are more likely to issue equity due to their precautionary motives (Lemmon and Zender, 2010; Fama and French, 2005; DeAngelo, DeAngelo, and Stulz, 2010). Previous studies document that one of the key motives for issuing seasoned equity offerings is cash holding. In particular, they show that this tendency is stronger among small and unprofitable firms due to their precautionary motives.[5] This is also consistent with the aforementioned argument by Myers and Majluf (1984) that firms issue stock to build up cash reserves or financial slack. Based on the discussion above, we expect newly listed firms to have more cash holding and engage in more investment opportunities than their peers after the option listing. Consistent with our predictions, we find that option listed firms hold more cash and invest more relative to their peers in the same industry. These effects are more pronounced among the firms with greater information asymmetry. Holding more cash after option listing is different from the decrease in cash hoarding after the addition to the S&P 500 index (Brisker et al., 2013). In addition, we find an increase in investment, particularly acquisitions, after option listing. This result is consistent with the findings of an increase in investment (Roll, Schwartz, and Subrahmanyam,

[5]DeAngelo, DeAngelo, and Stulz (2010) conclude that a higher cash ratio can be optimal for small growth firms and thus that a near-term cash need is the primary seasoned equity offering (SEO) motive. Kim and Weisbach (2008) find that firms save 53.4 cents of an incremental dollar raised in an SEO. Similarly, McLean (2011) shows that one additional dollar of proceeds from equity issuance results in 56.4 cents of cash savings.

2009) and patents (Blanco and Wehrheim, 2017) for firms with optionable stocks. Note that these studies did not explore the financing sources for these investments. By examining the use of SEO proceeds and financing sources of acquisitions, we find that the main source of financing to fund the newly listed firms' investment activities in the post-listing period is equity. For example, the percentage of SEO proceeds used for investment-related financing increases from 7.23% in the pre- listing period to 9.62% in the post-listing period. Moreover, newly listed firms engage in more acquisitions, which are mainly financed by equity in the short term and cash and equity in the long term. Overall, our findings suggest newly listed firms use the proceeds from equity offerings to build up cash reserves and to fund a larger investment set, including operational investments such as capital expenditures and strategic investments like acquisitions.

Our paper contributes to the literature in multiple ways. First, we find a significant change in the capital structure after option listing. Extant literature shows a significant impact of option listing on information asymmetry and the cost of financing. For example, listed firms on the option market experience a larger number of analyst following (Skinner, 1990), greater media coverage (Damodaran and Lim, 1991), an increase in informational efficiency (Anthony, 1988; Mayhew, Sarin, and Shastri, 1995; Pan and Poteshman, 2006), higher firm value (Roll, Schwartz, and Subrahmanyam, 2009), a lower cost of equity (Naiker, Navissi, and Truong, 2013), and a lower cost of debt (Do, Truong, and Vu, 2019; Cao et al., 2019). However, the effect of option listing on capital structure has not been explored yet. We contribute to the literature by presenting evidence that option listing leads to a significant decrease in leverage, which is mainly driven by an increase in equity issuance following the option listing. Particularly, this effect is more pronounced among firms with a higher level of information asymmetry prior to the listing or firms with a higher option trading volume after they are listed. These results support the argument of a positive role of option listing and trading in the information environment.

Second, we contribute to the literature by showing the effect of option listing on small companies' financing decisions. Previous literature on the S&P 500 Index revisions reports no change in equity issuance despite a decrease in the cost of equity, but an increase in debt issuance

given no significant changes in the cost of debt (Chen, Noronha, and Singal, 2004; Baran and King, 2012; Hong, Hwang, and Lee, 2019). Our sample firms are generally smaller than those in the S&P 500 index. Also, it is well known that small firms are more vulnerable to information asymmetry. As the two listing events exhibit certain similarities, our findings present several interesting differences compared to the S&P 500 index literature. We conjecture that these differences may be attributed to the difference in firm size and information asymmetry. Given that information asymmetry is the main driver for the link between option listings and leverage, we observe a more pronounced effect of listings on capital structure for firms who suffer from more severe information asymmetry problems. Our results indicate that a decrease in leverage, caused by more equity issues, is driven by small or unprofitable firms who are generally most opaque. In particular, the reversal in leverage and net equity issue after delisting suggests that these firms time equity offering when opportunities arise (a drop in information asymmetry due to opting listing), but reverse back to the pre-listing condition once the information advantage disappears.

Third, our paper contributes to the literature by reporting the real impacts of option listing on cash and investment policy. The previous literature documents an increase in investment after option listing, however, they did not study the changes in cash holdings or the financing sources of the increased investment. Our results indicate that firms use the proceeds from equity issues to build up cash reserves and engage in more investments. This suggests that option listing alleviates newly listed firms' financial constraint by allowing them to take advantage of the lower cost of equity, leading to greater financial slack and investments.

The remainder of this paper is organized as follows. The next section presents our hypotheses. Section 3 describes the sample construction process and the summary statistics of the final sample. Section 4 contains the main results of the empirical analysis and the results of several robustness tests. In section 5, we explore the mechanisms through which option listing affects corporate financing decisions. Section 6 presents the real consequences of option listing on newly listed firms' cash and investment policy. Section 7 concludes.

2. Hypothesis Development

As discussed above, the literature suggests that option listings result in a significant decrease in information asymmetry (Skinner, 1990; Damodaran and Lim, 1991; Hu, 2018). For example, Hu (2018) shows a drop in the level of information asymmetry after option listing events. These findings are supported by the argument that option trading generates new information or better information dissemination which cannot be explained by stock trading. Easley, O'Hara, and Srinivas (1998), Pan and Poteshman (2006), and Roll, Schwartz, and Subrahmanyam (2009) suggest that the volume of option trading conveys information about future stock prices and have a positive impact on firm value. In particular, Roll, Schwartz, and Subrahmanyam (2009) indicate that option trading volume reflects the extent of informed investors' participation and the richness in the information environment. Overall, these studies suggest that option trading improves the precision of the information and reduces information asymmetry.

Relatedly, several studies show that less information asymmetry leads to a lower cost of equity and cost of debt following the option listing events. For example, Naiker, Navissi, and Truong (2013) show that firms experience a significant decrease in the implied cost of equity following option listing. They also find that firms with a higher option trading volume are associated with a lower implied cost of equity capital. Their findings are consistent with those of Easley and O'Hara (2004) and Lambert, Leuz, and Verrecchia (2007) who find that information asymmetry adversely affects the cost of equity. As to the cost of debt, Do, Truong, and Vu (2019) and Cao et al. (2019) find similar effects of information asymmetry associated with option trading: the cost of debt decreases as option trading volume increases. Their findings are supported by the conjecture that the assessment of borrowers' credit risk requires costly information collection and analysis. As a result, any mechanisms that could reduce the level of information asymmetry between the borrowers and lenders are likely to lead to a lower borrowing cost. Option listing or trading can be regarded as one of the mechanisms among others such as repeating/relational banking (Bharath et al., 2011) and concentrated syndicate structure (Lim, Minton, and Wisbach, 2014), which have been shown to lead to a lower cost of

private loans.

The pecking order theory argued by Myers and Majluf (1984) suggests that information asymmetries between managers and outside investors create a financing hierarchy when funding investment opportunities: internal funds, debt, and equity. Firms may build up financial slack or cash reserves to preserve their ability to undertake investment projects: one of the ways to build slack is to issue stock during periods of low information asymmetry. Bharath, Pasquariello, and Wu (2009) and Chang, Dasgupta, and Hilar (2006) provide empirical support for an assumption that information asymmetry is an important determinant of capital structure, as indicated by the pecking order theory. They suggest that greater (or an increase in) information asymmetry is associated with a higher percentage of debt financing. In other words, there is a positive link between information asymmetry and leverage. As option listings reduce information asymmetry, we expect that a firm's leverage should decrease after its options are listed on an exchange. In addition, as discussed above, option listings lead to a lower cost of equity and cost of debt due to a decrease in information asymmetry. Firms may consider market timing for issuances and issue equity and/or debt as a result of a drop in financing costs. We conjecture that option listings are associated with greater net equity and/or net debt issuances. Furthermore, the pecking order theory suggests that firms may issue stock during periods of low information asymmetry to build up slack or reserve for future investment opportunities. We expect more equity issues than debt issues when there is a sizable drop in information asymmetry due to option listings. We formulate the first two hypotheses as follows:

Hypothesis 1: Firms that are newly listed on the option market are likely to have lower leverage due to lower information asymmetry.

Hypothesis 2: Option listing leads to greater net equity and/or net debt issues. We expect net equity issue to be greater than net debt issue.

As information asymmetry is the major support for the link between option listings and leverage, we explore various sources or channels through which information asymmetry is reduced after the option listing. First, an increase in investor interests as a result of option listing leads to greater information production by increased monitoring from institutional investors or analysts. Researchers show an increase in the number of analysts following, institutional holdings, and news coverage after option listing (Skinner, 1990; Damodaran and Lim, 1991; Ho, 1993). We conjecture that firms with a smaller number of analysts following, lower institutional holdings, or little media coverage before option listing are more likely to benefit from the greater information production associated with option listings. Second, there may be an improvement in information environment due to higher trading volumes (Hegde and McDermott, 2003; Chordia, Roll, and Subrahmanyam, 2001). For example, Hegde and McDermott (2003) report a decrease in the direct cost of trading and more frequent trading for the S&P 500 Index added firms, but an increase in the trading cost and less frequent trading for deleted firms. Roll, Schwartz, and Subrahmanyam (2009) show that option trading volume proxies for the extent of informed investors' participation as well as the richness in the information environment. Moreover, Truong and Corrado (2014) present that stocks with a higher option trading volume absorb earnings information faster and more efficiently. Naiker, Navissi, and Truong (2013) provide direct evidence for a negative correlation between option trading volume and the implied cost of equity capital. We expect the effect of option listings on leverage to be increasing in option trading volume. Third, Merton's (1987) model of market segmentation suggests that investors who are aware of a subset of all stocks will not be perfectly diversified, and thus they demand a premium (shadow cost) for the non-systematic risk. Chen, Noronha, and Singal (2004) suggest that investor awareness can help explain the positive price reactions to index inclusions as more investors become aware of the stocks added to the S&P 500 index. Following these arguments, we expect that a stock's listing on the option market can broaden investor awareness of the stock and consequently increase its breadth of the ownership. The reduction in the shadow cost reflects a lower level of information asymmetry. Based on the

discussion above, we formulate the below hypothesis:

Hypothesis 3: The effect of option listings on leverage and security issuance is more pronounced for firms that can benefit more from improved information production or for those with a higher option trading volume.

The precautionary saving theory posits that firms with small size or low profitability are more likely to issue equity due to their precautionary motives (Lemmon and Zender, 2010; Fama and French, 2005; DeAngelo, DeAngelo, and Stulz, 2010). For example, DeAngelo, DeAngelo, and Stulz (2010) conclude that a higher cash ratio can be optimal for small growth firms and thus a near-term cash need is the primary motive for seasoned equity offerings (SEOs). This is consistent with the aforementioned argument by Myers and Majluf (1984) that firms issue stock to build up cash reserves or financial slack. Several studies present empirical support for this argument by finding a high percentage of cash savings of the proceeds from a SEO: 53.4 cents saved for every dollar raised (Kim and Weisbach, 2008) or 56.4 cents per dollar raised (McLean, 2011). In addition, capital raised from equity and/or debt issues after option listings is likely to be used for investments, especially when the cost of capital is low (Baker, Stein, and Wurgler, 2003). Becker-Blease and Paul (2006) indicate that index inclusion results in a lower cost of capital and consequently an expansion of a firm's value-creating investment opportunity set. Roll, Schwartz, and Subrahmanyam (2009) and Blanco and Wehrheim (2017) suggest that firms with more active option trading are likely to have more investments or patents. Based on the above discussion, we formulate the below hypothesis:

Hypothesis 4: Firms that are newly listed on the option market tend to have more cash holdings and engage in more investment opportunities than their peers following the option listing event.

3. Data and Summary Statistics

3.1. *Data and Variables*

We start the sample construction by collecting the initial option listing dates from OptionMetrics. The initial option listing is identified by a firm appearing with option volume for the first time. As the data in OptionMetrics starts from 1996, this method may not necessarily capture the true listing date. To minimize possible identification errors, our sample starts from 1999.[6] For option dollar trading volume, we obtain data from OptionMetrics. We obtain the number of analysts from I/B/E/S, institutional ownership from Thomson Reuters, news coverage from LexisNexis, and proceeds and merger data from SDC.[7] We exclude firms that operate in the financial services (SIC codes 6000-6999) and utilities (SIC codes 4900-4999) industries. Our sample of option listings consists of 1,906 listing events from 1999 to 2017.

To construct a control sample, we adopt the eligibility requirements based on the option listing standard as of 1991 and a change in the criteria afterwards (Mayhew and Mihov, 2004; Hu, 2018). The eligibility requirements include: (1) the stock must be listed on a national exchange, (2) the stock must have at least seven million publicly held shares, (3) there must be at least two thousand shareholders, (4) no minimum stock trading volume is required, (5) the stock can have options five days after its initial public offering (IPO), and (6) the minimum security price is \$7.5. To meet the IPO condition, we use the IPO data from Dr. Ritter's homepage. Stock price and volume data are from CRSP. We agree with Mayhew and Mihov (2004) that it is practically impossible to check the condition about the number of shareholders, which dropped from the list of requirements. We use the number of shares outstanding to proxy for the number of publicly held shares.

Our final sample contains 11,311 firm-year observations associated with 1,906 unique firms from 1993 to 2017 with a 11-year window spanning from five years before and six years after each option listing year. We define a time variable, T, to denote the time period relative to

[6]This is an arbitrary number but our results are not affected by the change in the standard year to another (e.g. 1998, 2000).

[7]We are grateful to Sinan Dincer for sharing the data.

the option listing date. T=0 indicates the year in which a firm is newly listed on the option market, T=-1 (T=1) indicates the year prior to (following), and so on. T is assigned an integer between -6 and 5. We define *Book leverage* as total debt divided by total assets, where total debt is the sum of long-term debt and debt in current liabilities. *Market leverage* is defined as the ratio of total debt to the sum of total debt and market value of equity. *Net debt issue* is total debt minus the lagged total debt scaled by the lagged total assets. *Net equity issue* is the sales of common and preferred stock minus the purchases of common and preferred stock scaled by the lagged total assets. *ROA* is net income divided by the market value of equity. *M/B* is the sum of the book value of total liabilities and the market value of equity scaled by total assets. *Tangibility* is the ratio of net property, plant, and equipment to total assets. *Investment* is defined as capital expenditures divided by the lagged total assets, and *cash* is defined as cash and short-term investments scaled by total assets. *Size* is the natural logarithm of total assets. All variables are defined in Appendix A and are winsorized at 1% at both tails of the distribution.

3.2. *Summary Statistics*

In Table I, we report the summary statistics on the newly listed firms in our sample during the pre- and post-listing periods, respectively. The pre-listing period is defined as the period from T=-6 to -2, and the post-listing period is defined as the period from T=0 to 5. This is an unbalanced panel data which is mainly attributable to the fact that some firms are listed to the option market when they are introduced in Compustat for the first time.[8] For each firm, we require that it must have at least one observation in the pre- and the post-listing period.

Both *Book leverage* and *Market leverage* are lower during the post-listing period compared with the pre-listing period. In particular, *Book (Market) leverage* decreases from 20.8% (15.0%) to 18.2% (12.2%). The difference in *Book (Market) leverage* is statistically significant. *Net equity issue* increases from 14.9% before the listing to 15.9% afterwards. However, *Net debt*

[8]When we use a more balanced panel in the matched sample, the main result remains identical. We prefer not to drop these samples due to the concern of a sample selection bias.

issue seems to stay relatively constant around option listings. This is consistent with the firms' negative *ROA* on average, as previous literature suggests that small or unprofitable firms are the primary issuers of equity (Frank and Goyal, 2003; Lemmon and Zender, 2010; Fama and French, 2005; DeAngelo, DeAngelo, and Stulz, 2010). *Size* indicates that sample firms are smaller companies relative to those in S&P 500 or Russell 1000. *Cash* on average increases from 21.5% to 30.4% after the new option listing. The increase in cash holdings following option listings is consistent with our expectations. As option listing leads to a drop in information asymmetry and lower costs of capital, we conjecture that firms may time the market to issue equity and debt to take advantage of the lower financing costs. Furthermore, the precautionary saving theory posits that small or unprofitable firms tend to issue equity due to their precautionary motives (Lemmon and Zender, 2010; Fama and French, 2005; DeAngelo, DeAngelo, and Stulz, 2010). An increase in cash holdings is also consistent with the pecking order argument by Myers and Majluf (1984) that firms issue stock to build up cash reserves.

TABLE I ABOUT HERE

4. Option Listing and Financing Policies

In this section, we investigate the financing behavior of firms that have been selected by an option exchange to list their options for the first time. Based on the first hypothesis we develop in Section 2, option listing leads to a lower level of information asymmetry and consequently lower costs of capital. The pecking order explanation suggests a positive relation between information asymmetry and leverage (Myers and Majluf, 1984; Bharah et al., 2009). Therefore, we expect a decrease in leverage after the initial option listing.

4.1. *Option Listing and Leverage*

We first test the dynamic change in leverage and net security issue in a panel setting. Table II presents the regression results. The dependent variables include *Book leverage, Market*

leverage, Net debt issue, and Net equity issue. We control for *Size, ROA, M/B, Tangibility, Cash, Dividend payer dummy, and Investment.* Fixed effects are included in all models and standard errors are clustered at the firm level. The main variable of interest for all models is *After*, which is an indicator variable that is assigned a value of one for the post-listing period and zero otherwise.[9] The coefficient of *After* is significant and negative in models 1 through 4, suggesting a reduction in leverage after controlling for other factors that have been shown to drive leverage. The coefficients in models 1 and 3 are similar in size and suggest a large economic impact of option listing on leverage. In particular, option listing is associated with a 5% reduction in leverage, which is equivalent to 12% (9%) of the standard deviation of Market (Book) leverage. Since the leverage ratio is censored between zero and one, we use the Tobit model and find similar as shown in models 2 and 4. These findings are consistent with the proposition that firms decrease leverage after option listing, supporting a positive relationship between information asymmetry and leverage (Bharath, Pasquariello, and Wu, 2009; Myers and Majluf, 1984). [10]

4.2. *How do firms change their financing pattern after option listing?*

Firms with option listing experience a decrease in information asymmetry (Hu, 2018) and lower costs of financing (Naiker, Navissi, and Truong, 2013; Do, Truong, and Vu, 2019). Firms are likely to take advantage of the market timing to issue equity and/or debt. Our Hypothesis 2 suggests an increase in equity and debt issuances following the option listing. In addition, as suggested by the pecking order theory that firms issue stock to build its cash reserves when information asymmetry level is low, we expect more equity issues than debt issues when there is a sizable drop in information asymmetry.

To test this hypothesis, we examine the effect of option listing on equity and debt issuance

[9]In the empirical analysis throughout the study, we use a 11-year window around the option listing year, containing 5 years before as the pre-listing period and 6 years after as the post-listing period. As a robustness check, we use a shorter window of 6 years around the option listing year T=(-3, 2) and rerun the analysis. Appendix B.I shows the regression results using the same models shown in Table II.

[10]As a robustness check, we use alternative definitions of Book leverage and Market leverage and find similar results.

behaviors. Models 5 and 6 in Table II show that firms experience an increase in *Net equity issue*, but not in *Net debt issue*. In model 6, the coefficient of *After* is positive and statistically significant. The economic impact is also significant: firms issue 14.5% more equities after being listed on the option market. These results confirm the effect of option listing on financing decisions, more specifically on equity issues. Consistent with our expectation, newly listed firms take advantage of the reduction in information asymmetry and a lower cost of equity by issuing more equities. The same impact is not found in debt issues. [11]

TABLE II ABOUT HERE

4.3. Robustness Checks

So far in our empirical analysis, we assume that option listing is exogenous. This is a reasonable assumption as option listing, similar to the S&P 500 Index inclusion (Brisker, Colak, and Peterson (2013), Aghion, Van Reenen, and Zingales (2013), Faulkender and Petersen (2006), Yu (2008)), is determined by the option exchanges. Nonetheless, for robustness check, we consider the possibility that option listing may be influenced by a set of unobservable factors, which may also affect capital structure. To address this possibility, we adopt two approaches: The Instrumental Variable (IV) approach and the Difference-In-Difference approach. As we do not find a significant impact of option listing on net debt issue, we focus on the effects on the leverage ratios and net equity issue from this point onward.

4.3.1. *Instrumental variable (IV) approach*

We adopt the IV approach as a robustness check to provide further confirmation of our main results. The IV model has been widely used in literature to address the endogeneity problem.

[11] To confirm our assumption of a significant drop in the cost of equity for the newly listed firms, we examine the cost of equity of the sample firms around option listing. Using the CAPM, Fama 3-factor, and Fama and French 4-factor models, we estimate the cost of equity for a 6-year window. Figure 1 shows the pattern in the cost of equity for sample firms. We also examine the newly listed firms' cost of debt and find no significant changes around the option listing. Appendix B.II shows the cost of equity and cost of debt comparison for before and after the option listing.

One of the main challenges in applying the IV approach is to find a valid instrument that is correlated with the likelihood of option listing but is unlikely to be related to leverage. We use the educational connection of managers or board directors working in the candidate firms as an instrument of option listing. Among many connections, we focus on the educational connection through schools that board directors or managers attended following Cohen, Frazzini, and Malloy (2008). The conjecture is that if a candidate company has connections with the Cboe, then it is more likely to be listed on the option market. The managers or directors at the Cboe may have an incentive to share private information with the managers or directors at a candidate firm with whom they have a connection for the hope of an employment opportunity at the candidate companies at the end of their tenure at the Cboe. Importantly, the education connection between the managers or directors of the candidate firms and those at the Cboe is irrelevant to the capital structure decisions of the candidate firms.

Educational connection is a dummy variable equal to one if any of the candidate firm's board directors or top executives graduated from the same school as any of the managers or directors at the Cboe at the same time. We identify this relationship using Boardex. This connection should have been made prior to the listing decision was made. Table III presents the results of the IV model. The dependent variables are *Treated*, a binary variable equal to one if it is listed on an option exchange, and zero otherwise, *Book leverage, and Market leverage, Net equity issue*, respectively. Model 1 presents the first stage of the IV models whereas models 2, 3 and 4 present the results of the second-stage regressions. In model 1, the coefficient of *Educational connection* is positive and statistically significant, which is consistent with the expectation that education connection is associated with a higher probability of the candidate firm being listed on an option exchange. The F-statistic is greater than 10, which passes the "weak instrument test" of Stock and Yogo (2005). Models 2-4 suggest that option listing leads to a significant drop in leverage and an increase in net equity issue. These results are consistent with the base case results shown in Table II, providing support for the robustness of our main findings.

TABLE III ABOUT HERE

4.3.2. *Difference-In-Difference Approach*

We use the Difference-In-Difference approach in the form of panel regressions with fixed effects. By comparing the difference in leverage and financing sources before and after the option listing, the concern that a set of unobservable factors are driving the results can be alleviated. To perform this analysis, we use two matching methods. In the first method, we use the portfolio matching method to match the newly listed firms with their peer firms that are eligible to be listed but not selected by the option exchange. Prior literature suggests that options exchanges select stocks based on firm size, trading volume, stock return volatility, bid-ask spread, and industry (Mayhew and Mihov, 2004; Danielsen, Van Ness, and Warr, 2007). Following the literature, for each option listed firm we identify all control firms that are in the same industry based on the two-digit SIC code and satisfy the eligibility requirements set forth by the option exchange. In addition, the control firms need to be in the same bins in terms of stock return volatility, stock trading volume, and market capitalization.[12] Figure 2 presents a graphical illustration of the changes in *Book leverage* and *Market leverage* around option listing for the treatment firms and control firms. Table IV presents the results. Models 1 and 2 show that the option listed firms experience a significant decrease in leverage compared to the control firms. *Book leverage* of the listed firms is 1.7% lower than that of the control firms while *Market leverage* of the listed firms is 3.6% lower. The difference between the two groups becomes even larger when we examine equity financing. Model 3 shows a 15.1% increase in net equity issue for the listed firms after the option listing relative to the control firms. These results support the conjecture that option listing has a significant effect on information asymmetry and firms take advantage of the timing and issue more equity. In addition, our findings are consistent with the findings of Kalda (2017) who documents that option listing leads to a decline in information

[12]Mayhew and Mihov (2004) suggest that these three factors are the most important determinants of the option listing decisions.

acquisition on peer firms as investors reallocate more resources towards the listed firms' stocks at the expense of the stocks of the peer firms. As a result, peer firms may face a drop in demand for their securities in the capital markets and thus fewer security issues compared to the newly listed firms.

For the second method, we use the propensity score matching to pair the newly listed firms with their industry peers based on all independent variables plust market asset growth rate and year. We match each newly listed firm with its peer firm based on the nearest-neighbor matching to minimize the potential unobserved heterogeneity (Abadie and Imbens, 2006). As shown in Panel A, Table V, the results are generally consistent with those based on the portfolio matching method. After the option listing, the leverage of the treatment firms is significantly lower than that of the control firms. Similarly, newly listed firms issue more equity relative to their peers. The large coefficient of *Net equity issue* suggests that the newly listed firms have a much stronger tendency to issue equity after the option listing compared to the control firms. Panel B Table V shows that our model satisfies key underlying assumption of difference-in-differences, the parallel trends assumption.

Table IV About Here

Table V About Here

5. What Drives the Change in Leverage?

So far, the results indicate that firms experience a decrease in leverage and issue more equity than debt. In this section, we explore the mechanisms through which option listing affects leverage and security issuance. First of all, as information asymmetry is the main driver for the link between option listings and leverage, we expect the impact of option listings on capital structure to be more pronounced for firms who suffer from more severe information asymmetry problems. Previous literature shows that equity issuers tend to be small or unprofitable (Frank

and Goyal (2003), Lemmon and Zender (2010), Fama and French (2005), DeAngelo, DeAngelo, and Stulz (2010)). We expect the impact of option listings on leverage should be greater for smaller or unprofitable firms. In our sample firms, unprofitable firms tend to be small as well. When we divide the sample based on firm size, the results are similar to those based on profitability. For brevity, we present the results based on profitability in Table VI. We divide the sample into two groups: firms with a *negative ROA* and firms with a *positive ROA*. We then run the OLS regressions of *Book leverage, Market leverage* and *Net equity issue* by group. As anticipated, the coefficients of *After* are much larger for the negative *ROA* firms (models 1-3) than those for the positive *ROA* firms (models 4-6). Particularly, we observe a significant increase in *Net equity issue* in the negative *ROA* group, but not in the positive *ROA* group. We obtain similar results when we use the Tobit model for the leverage ratio regressions.

TABLE VI ABOUT HERE

Next, we examine various information channels through which option listing reduces information asymmetry and therefore affects leverage and security issuance.

5.1. *Information Production Channel*

As stated in Hypothesis 3, investor interests are expected to rise as a result of option listing, leading to greater information production by increased monitoring or attention from institutional investors or analysts. Researchers show that the number of analysts following, institutional holdings, and news coverage significantly increased after option listing (Skinner, 1990; Damodaran and Lim, 1991; Ho, 1993).[13] Based on these findings, we expect that firms with a smaller number of analysts, lower institutional holdings, or little media coverage before the listing event are more likely to benefit from the greater information production associated

[13]To show how information environment changes for the newly listed firms around option listing, we present in Figure 3 the changes in PIN (Probability of Informed Trading), the number of analysts, and institutional ownership in the 11-year window T=(-6, 5) around the option listing year (T=0). In addition to the graphical illustration, we show in Appendix B.III significant changes in these information asymmetry measures using multivariate regressions.

with the option listing. We divide the sample into two halves by each of the three information production proxies measured prior to the announcement of option listing. An option listing firm is classified as low (high) if the number of analysts following is below (above) the sample median, if the institutional ownership is below (above) the sample median, or if the major news coverage is below (above) the sample median.[14]

The results are presented in Table VII. Panels A reports the results for *Book leverage, Market leverage, and Net equity* issue based on the grouping by the number of analysts following. The results suggest that the effect of opting listing on leverage and equity issuance is more pronounced for firms with fewer number of analysts following in pre-listing period. For the "low" group, the coefficient of *After* is negative and statistically significant in model 1 and 2 (*Book leverage* and *Market leverage*) and positive and significant in model 3 (*Net equity issue*). Although we observe similar patterns in models 4-6 for the "high" group, the statistical and economic significance of the coefficient of *After* is much less than that for the "low" group. In Panels B and C, we repeat the analysis by dividing the sample based on institutional ownership and news media coverage respectively. The results are generally similar to those in Panel A: Firms with low institutional ownership or little news media coverage prior to the listing experience a larger drop in leverage and a greater increase in equity issue as a result of the option listing. The results are qualitatively similar when we use the Tobit model for the leverage ratio regressions. Overall, the results shown in Table VII suggest that the decrease in leverage and the increase in equity issue are more pronounced for the newly listed firms with low information production prior to the listing, supporting the information production channel as stated in Hypothesis 3.

TABLE VII ABOUT HERE

[14]It is possible the number of analysts, institutional ownership, or news coverage varies significantly across industries. As a result, we use the industry median value (instead of the sample median value) to divide the sample into high and low groups and find similar results.

5.2. *Information Environment Channel*

Also stated in Hypothesis 3, the literature has shown that higher trading volume can result in an improvement in information environment (Hegde and McDermott, 2003; Chordia, Roll, and Subrahmanyam, 2001). For the option market, Roll, Schwartz, and Subrahmanyam (2009) indicate that option trading volume reflects the extent of informed traders' participation and the richness in the information environment. Naiker, Navissi, and Truong (2013) show a negative link between option trading volume and the implied cost of equity capital, which proxies for the adverse selection cost. Based on the literature, we expect higher option trading volume leads to greater improvement in information environment. Thus, the effect of option listings on leverage and security issuance should be increasing in option trading volume. To test this prediction, for each option listed firm in a given year we calculate the annual dollar option trading volume by summing up the daily values. Following Roll, Schwartz, and Subrahmanyam (2009), each daily value is defined as the midpoint of the daily closing bid and ask prices multiplied by the trading volume for the day. We then divide the firm-year observations into two halves based on the median option trading volume for a given year. We present the results in Table VIII. The coefficients of *After* in both groups show the same pattern of a decrease in leverage and an increase in net equity issue. However, the group with high option trading volume exhibits a more pronounced effect of opting listing than the low option trading group.[15] This result supports the prediction that more active option trading leads to better information environment and consequently a larger impact of option listing on leverage and equity issuance, supporting the information environment channel as stated in Hypothesis 3.

TABLE VIII ABOUT HERE

[15] Again, we obtain similar results when the Tobit model is used in the leverage ratio regressions.

5.3. Investor Awareness Channel: Evidence from Delisting Events

As previously discussed, we propose the investor awareness channel through which information asymmetry is reduced due to an option listing event. For example, Chen, Noronha, and Singal (2004) show that the positive price reactions to S&P 500 index inclusions can be explained by an increase in investor awareness. Based on the arguments of the investor awareness hypothesis, we expect the option listing of a stock will increase investor awareness and attract broader ownership. The reduction in shadow cost as a result of an increase in investor awareness suggests a lower level of information asymmetry. Therefore, we can view investor awareness explanation as a possible channel for the effect of option listing on leverage and security issue.

To investigate whether investor awareness plays a role in the link between option listing and financing decisions, we consider the delisting events. If the improvement in investor awareness through option listing is permanent, investor awareness should remain stable after delisting. To test this prediction, we focus on the option listed firms with a history of being delisted at least one time after their options were initially listed.[16] *Delisting* is defined as a dummy variable that equals one if the annual option trading volume becomes zero or missing after the initial option listing date, and zero otherwise. We use PIN to proxy for the level of information asymmetry.[17] Table IX reports the regression results of *PIN, Book leverage, Market leverage, and Net equity issue* on Delisting and other control variables. We find that PIN, which proxies for information asymmetry, is significantly higher after delisting. *Market leverage* also experiences a significant increase as a result of the delisting. Both debt and equity issues decrease significantly after delisting. These findings indicate that the effect of option listing on leverage and security issuance is reversed for delisting, which is inconsistent with a permanent effect of option listing on investor awareness. We believe this is evidence that investor awareness is unlikely to be a channel for the reduction in information asymmetry associated with option listing. To sum up, we find that the channels for the reduction in information asymmetry associated with option

[16]The sample consists of 572 newly listed firms who are later delisted.

[17]Due to the data limit, the time series of the sample firms for this regression ends in 2010. We downloaded this data from `http://scholar.rhsmith.umd.edu/sbrown/pin-data`.

listings are greater information production and better information environment rather than improved investor awareness.

TABLE IX ABOUT HERE

6. Cash Holding and Investment Activities after Option Listing

Our results so far have shown that the newly listed firms take advantage of a significant improvement in information asymmetry and a drop in financing cost to issue more equities after the listing. In this section, we examine how firms use the proceeds from the new equity issues. The precautionary saving theory posits that firms with small size or low profitability are more likely to issue equity due to their precautionary motives (DeAngelo, DeAngelo, and Stulz, 2010; Kim and Weisbach, 2008; McLean, 2011). DeAngelo et al., (2010) suggest that a higher cash ratio can be optimal for small growth firms and cash need is the primary motive for SEOs. Myers and Majluf (1984) argue that firms issue stock to build up cash reserves or financial slack especially during periods of low information asymmetry. In addition, previous literature on option listings suggests that firms with more active option trading are likely to have more investments or patents (Roll, Schwartz, and Subrahmanyam, 2009; Blanco and Wehrheim, 2017). Based on these arguments, we anticipate an increase in cash holdings and investment activities for the newly listed firms after the option listing.

In addition to cash holdings (*Cash*), we examine two major types of investments: capital expenditure (*Investment*) and the number of completed mergers (*Complete# of mergers*). Panel A of Table X presents the regression results of *Cash, Investment, and Complete # of mergers* on the option listing dummy variable (*After*) and control variables. Models 1-3 present the results for the option listed firms only, while models 4-6 show the results for a sample of the option-listed firms (the treatment group) and their industry peers (the control group). We find that the newly listed firms hold 3.9% more cash in the post-listing period than in the pre-listing period (model 1). Prior literature suggests that small firms or firms with high growth

opportunities are more likely to hold more cash. The coefficient of *Size* is negative while that of *M/B* is positive and statistically significant, implying that smaller or higher-growth firms tend to hold more cash. These findings are consistent with the precautionary saving motive. We find evidence that investment activities such as capital expenditure and mergers increase after option listing. In particular, capital expenditure (*Investment*) increases by 2.0% (model 2) and the number of completed mergers (*Complete # of mergers*) goes up by 6.6% (model 3) after the option listing announcement. Results shown in models 4-6 are similar to those in models 1-3. These findings indicate that, compared to the control firms, the newly listed firms tend to hold more cash and engage in more investment opportunities.

We further examine the primary stated purposes of SEOs issued by the newly listed firms around the option listing events. Information on the use of SEO proceeds is collected from the Thomson Reuter's SDC New Issues database. Panel B of Table X presents the findings. We find that the proportion of SEOs marked with investment-related financing increases from 7.23% in the pre-listing period to 9.62% in the post-listing period. On the contrary, the portion of debt-related financing SEOs decreases from 5.96% to 2.59% after the option listing. This finding provides additional evidence that one of the likely uses of proceeds from the increase in equity issue after option listing is to fund investments. Our result is consistent with the findings of Baker, Stein, and Wurgler (2003) that firms raise capital and quickly spend the proceeds on projects when the cost of equity is low

Additionally, we find that the newly listed firms finance their acquisitions through equity in the short-run while they finance with both cash and equity in the long-run. We obtain the bidder financing sources for acquisitions from Thomson Reuter's SDC Mergers and Acquisitions database. Panel C of Table X presents the method of payment for acquisitions by the newly listed firms. *Cash financing* measures the proportion of cash only acquisitions. *Equity financing* shows the proportion of equity only acquisitions. *Broad cash financing* shows the proportion of cash payment in a broad concept. *Broad equity financing* is the proportion of stock payment in a broad concept. In the 2-years post-listing window, we find a significant increase in *Equity*

financing and *Broad equity financing* acquisitions. However, the proportion of *Cash financing* acquisitions seems to drop slightly (about 4%) after the option listing. As we expand the time window to 6 years and 10 years, we find that firms choose both cash and equity as the payment method. This may be attributed to the control concerns. Financing acquisitions mainly with equity may attract a group of new blockholders who are interested in corporate control. This is particularly true when the deal size is large. Therefore, firms tend not to fully rely on stock payment for their acquisitions as a long-term strategy (Stulz, 1988; Jung, Kim, and Stulz, 1996; Faccio and Masulis, 2005).

To see if the increase in cash and investment activities after option listing can be linked to information asymmetry, we adopt one of the information production proxies, the percentage of institutional ownership. In particular, we divide the sample into halves by the median value of institutional ownership and repeat the analysis in Panel A. The results shown in Panel D indicate that firms with low institutional ownership (i.e. less information production and therefore greater information asymmetry) are driving the results. In other words, the findings suggest that option listing has a real consequence on firms' cash holdings, investments, and acquisitions through the information production channel.

TABLE X ABOUT HERE

7. Conclusion

We examine how option listing affects firms' financing decisions. Our results show that option listing results in significantly lower leverage compared to firms without option listing. This finding provides support for our conjecture that newly listed firms are likely to have lower leverage due to lower information asymmetry. This is consistent with the prediction of the pecking order theory that there is a positive link between information asymmetry and leverage. In terms of security issuances, we find that option listing leads to greater net equity issues but no significant changes in net debt issue. The result is consistent with both the market timing

and pecking order explanations. In particular, the literature has shown that option listing leads to a lower cost of equity and a lower cost of debt due to a decrease in information asymmetry. Firms may consider market timing to issue more equity and/or debt to take advantage of a drop in financing costs. The pecking order theory suggests more equity than debt issues when information asymmetry is reduced, as firms are likely to issue stock during periods of low information asymmetry to build up financial slack and/or cash reserves for future investments.

As information asymmetry is the major support for the relation between option listing and financing decisions, we explore various channels through which information asymmetry is reduced due to option listing and how these channels drive the impact of option listing on leverage and security issues. We first find that the impact of option listing on firms' financing decisions is more prominent for small or unprofitable firms, who tend to have greater information asymmetry. In addition, we find that effect of option listing on leverage and net equity issue is concentrated in firms who can benefit from greater information production: firms with a lower number of analysts, lower institutional holdings, or low news coverage. Furthermore, our finding indicates that for newly listed firms, the link between option listing and financing policies is increasing in option trading volume. This result supports the information environment channel as option trading volume reflects the extent of informed investors' participation and the richness in the information environment. Interestingly, we find little support for the investor awareness channel as the drop in leverage and the increase in net equity issue associated with option listing are reversed after the delisting. Finally, in the post-listing period firms increase their cash holding, investment, and acquisitions, which are mainly funded by equity issues. Overall, our findings support that option listing leads to greater information production and better information environment that is distinct from the information provided by the stock market. The resulting reduction in information asymmetry leads to lower leverage and greater equity issues after the listing. Firms use the capital from seasoned equity offerings to engage in more investments and increase their cash holding.

References

Abadie, A., and G. Imbens. 2006. Large sample properties of matching estimators for average treatment effects. *Econometrica* 74, 235-267.

Aghion, P., J.V. Reenen, L. Zingales. 2013. Innovation and institutional ownership. *American Economic Review* 103, 277–304.

Anthony, J. 1988. The interrelation of stock and option market trading-volume data. *Journal of Finance* 43, 949-964.

Baker, M., and J. Wurgler. 2002. Market timing and capital structure. *Journal of Finance* 57, 1-32.

Baker, M., R. Greenwood, and J. Wurgler. 2003. The Maturity of Debt Issues and Predictable Variation in Bond Returns, *Journal of Financial Economics* 70, 261-291.

Baker, M., J. Stein, and J. Wurgler. 2003. When does the market matter? stock prices and the investment of equity-dependent firms. *Quarterly Journal of Economics* 118, 969–1005.

Baran, L., and T. D. King. 2012. Cost of equity and S&P 500 index revisions. *Financial Management* 41, 457-481.

Becker-Blease, J.R. and D.L. Paul. 2006. Stock Liquidity and Investment Opportunities: Evidence from Index Additions. *Financial Management* 35: 35-51.

Bharath, S., P. Pasquariello, and G. Wu. 2009. Does asymmetric information drive capital structure decisions? *Review of Financial Studies* 22, 3211–3243.

Bharath, S. T., S. Dahiya, A. Saunders, and A. Srinivasan. 2011. Lending relationships and loan contract terms. *Review of Financial Studies* 24: 1141-1203.

Blanco, I., and D. Wehrheim. 2017. The bright side of financial derivatives: option trading and firm innovation. *Journal of Financial Economics* 125, 99-119.

Brisker, E., G. Colak, and D. Peterson. 2013. Changes in cash holdings around the S&P 500. *Journal of Banking & Finance* 37, 1787-1807.

Cao, J., M. Hertzel, J. Xu, and X. Zhan. 2019. Options trading and corporate debt structure. Working paper.

Chakravarty, S., H. Guien, and S. Mayhew. 2004. Informed trading in stock and option markets. *Journal of Finance* 59, 1235-1257.

Chang, X., S. Dasgupta, and G. Hilary. 2006. Analyst coverage and capital structure decisions. *Journal of Finance* 61, 3009-3048.

Chen, H., G. Noronha, and V. Singal. 2004. The price response to the S&P 500 additions and deletions: evidence of asymmetry and a new explanation. *Journal of Finance* 59, 1901-1929.

Chordia, T., R. Roll, and A. Subrahmanyam. 2001. Market liquidity and trading activity. *Journal of Finance* 56, 501-530.

Cohen, L., A. Frazzini, and C. Malloy. 2008. The small world of investing: board connections and mutual fund returns. *Journal of Political Economy* 116, 951-979.

Damodaran, A., and J. Lim. 1991. The effects of option listing on the underlying stocks' return process. *Journal of Banking and Finance* 15, 647-664.

Danielsen, B., B. Van Ness, and R. Warr. 2007. Reassessing the impact of option introductions on market quality: a less restrictive test for event-date effects. *Journal of Financial and Quantitative Analysis* 42, 1041-1062.

DeAngelo, H., L. DeAngelo, and R. M. Stulz. 2010. Seasoned equity offerings, market timing, and the corporate lifecycle. *Journal of Financial Economics* 95, 275-295.

Do, V., C. Truong, and T. Vu. 2019. Option listing and loan contract terms. Working paper.

Easley, D., M. O'Hara, and P. Srinivas. 1998. Option volume and stock traders trade. *Journal of Finance* 53, 431-465.

Easley, D., and M. O'Hara. 2004. Information and the cost of capital. *Journal of Finance* 59, 1553-1583.

Faccio, M., and R. W. Masulis. 2005. The choice of payment method in european mergers and acquisitions. *Journal of Finance* 60, 1345-1388.

Faulkender, M., M.A. Petersen. 2006. Does the source of capital affect the capital structure? *Review of Financial Studies* 19, 45–79.

Fama, E., and K. French. 2005. Financing decisions: who issues stock? *Journal of Financial Economics* 76, 549–582.

Frank, M., and V. Goyal. 2003. Testing the pecking order theory of capital structure. *Journal of Financial Economics* 67, 217–248.

Frank, M. Z., and T. Shen. 2016. Investment and the weighted average cost of capital. *Journal of Financial Economics* 119, 300–315.

Fedenia, M., and T. Grammatikos. 1992. Options trading and the bid-ask spread of the underlying stocks. *Journal of Business* 65, 335-351.

Ge, L., T. C. Lin, and N. D. Pearson. 2016. Why does the option to stock volume ratio predict stock returns? *Journal of Financial Economics* 120, 601–622.

Graham J., C. Harvey. 2001. The theory and practice of corporate finance: evidence from the field. *Journal of Financial Economics* 60:187-243.

Heckman, J. J. and J.A. Smith. 1999. The Pre-programme Earnings Dip and the Determinants of Participation in a Social Programme. Implications for Simple Programme Evaluation Strategies. *The Economic Journal* 109, 313-348.

Hegde, S. P, and J. B. McDermott. 2003. The liquidity effects of revisions to the S&P 500 index: an empirical analysis. *Journal of Financial Markets* 6, 413-459.

Heer, B., M. Trede, and M. Wahrenburg. 1997. The effect of option trading at the DTB on the underlying stocks' return variance. *Empirical Economics* 22, 233-245.

Ho, L. C. 1993. Option trading and the relation between price and earnings: a cross-sectional analysis. *Accounting Review* 68, 368-384.

Hong, E.P., M. Hwang, and J.Y. Lee. 2019. Strategic Adjustment of Capital Structure: Evidence from S&P 500 Index Additions, Working Paper.

Hu, J. 2014. Does option trading convey stock price information? *Journal of Financial Economics* 111, 625-645.

Hu, J. 2018. Option listing and information asymmetry. *Review of Finance* 22, 1153-1194.

Johnson, T. L., and E. C. So. 2012. The option to stock volume ratio and future returns. *Journal of Financial Economics* 106, 262-286.

Jung, K., Y. C. Kim, and R. M. Stulz. 1996. Timing, investment opportunities, managerial discretion, and the security issue decision. *Journal of Financial Economics* 42, 159– 185

Kalda, A. 2017. Option listing, limited attention and peer firm value. Working Paper.

Kim, W., and M. S. Weisbach. 2008. Motivations for public equity offers: an international perspective. *Journal of Financial Economics* 87, 281-307.

Lambert, R., C. Leuz, and R. Verrecchia. 2007. Accounting information, disclosure, and the cost of capital. *Journal of Accounting Research* 45, 385-420.

Lemmon, M., and J. Zender. 2010. Debt capacity and tests of capital structure theories. *Journal of Financial and Quantitative Analysis* 45, 1161-1187.

Lim J., B.A. Minton, M.S. Weisbach. 2014. Syndicated loan spreads and the composition of the syndicate. *Journal of Financial Economics* 111(1). 45-69.

Loughran, T., and J. Ritter. 2004. Why has IPO underpricing changed over time? *Financial Management* 33, 5-37.

Mayhew, S., A. Sarin, and K. Shastri. 1995. The allocation of informed trading across related markets: analysis of the impact of changes in equity-option margin requirements. *Journal of Finance* 50, 1635-1653.

Mayhew, S., and V. Mihov. 2004. How do exchanges select stocks for option listing? *Journal of Finance* 59, 447-471.

McLean, R. D. 2011. Share issuance and cash savings. *Journal of Financial Economics* 99, 693- 715.

Merton, R. 1987. A simple model of capital market equilibrium with incomplete information. *Journal of Finance* 42, 483-510.

Muravyev, D., and N. D. Pearson. 2016. Option trading costs are lower than you think. Working Paper.

Myers, S. C, and N. S. Majluf. 1984. Corporate financing and investment decisions when firms have information those investors do not have. *Journal of Financial Economics* 13, 187-221.

Naiker, V., F. Navissi, and C. Truong. 2013. Options trading and the cost of equity capita., *Accounting Review* 88, 261-295.

Pan, J., and A. Poteshman. 2006. The information in option volume for future stock prices. *Review of Financial Studies* 19, 871-908.

Roll, R., E. Schwartz, and A. Subrahmanyam. 2009. Options trading activity and firm valuation. *Journal of Financial Economics* 94, 345-360.

Skinner, D. 1990. Options markets and the information content of accounting earnings releases. *Journal Accounting and Economics* 13, 191-211.

Stephan, J. A., and R. E. Whaley. 1990. Intraday price change and trading volume relations in the stock and stock options markets. *Journal of Finance* 45, 191-220.

Stock, J. H., and M. Yogo. 2005. Testing for weak instruments in linear IV regression. In D.W.K. Andrews and J.H. Stock, eds. *Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg.* Cambridge: Cambridge University Press, pp. 80-108. Working paper version: NBER Technical Working Paper 284, 2002. http://www.nber.org/papers/T0284.

Stulz, R. M. 1988. Managerial control of voting rights. *Journal of Financial Economics* 20, 25– 54.

Truong, C., and C. Corrado. 2014. Options trading volume and stock price response to earnings announcements. *Review of Accounting Studies* 19, 161-209.

Valta, P. 2012. Competition and the cost of debt. *Journal of Financial Economics* 105, 661–682.

Vijh, A. 1990. Liquidity of the CBOE equity options. *Journal of Finance* 45, 1157-1179.

Wei, P., P. Poon, and S. Zee. 1997. The effect of option listing on bid-ask spreads, price volatility and trading activity of the underlying OTC stocks. *Review of Quantitative Finance and Accounting* 9, 165-180.

Yu, F., 2008. Analyst coverage and earnings management. *Journal of Financial Economics* 88, 245–271.

Appendix A: Variable Definitions

Dependent Variables	
Book leverage$_t$	(Long-term debt (dltt$_t$) + debt in current liabilities (dlc$_t$)) / total assets (at$_t$)
Market leverage$_t$	(Long-term debt (dltt$_t$) + debt in current liabilities(dlc$_t$)) / (long-term debt (dltt$_t$) + debt in current liabilities (dlc$_t$) + market value of equity (prcc$_t$ x csho$_t$))
Net debt issue$_t$	(Long-term debt (dltt$_t$) + debt in current liabilities (dlc$_t$) - lagged long-term debt (dltt$_{t-1}$) - lagged debt in current liabilities (dlc$_{t-1}$))/ lagged total assets (at$_{t-1}$)
Net equity issue$_t$	(Sales of common and preferred stock (sstk$_t$)- purchases of common and preferred stock (prstkc$_t$)) / lagged total assets (at$_{t-1}$)
Complete # of mergers$_t$	The number of complete mergers with 100% stock acquisition of target company by acquirer
PIN	The Probability of Informed Trading
Independent Variables	
After	1 if it is in the post-listing period; 0 otherwise
Treated	1 for listed firms on the option market for the first time; 0 otherwise
Size$_t$	The natural logarithm of total assets (at$_t$)
ROA$_t$	Income before extraordinary items (ib$_t$) / lagged total assets (at$_{t-1}$)
M/B$_t$	(Total liabilities(lt$_t$) + market value of equity (prcc$_t$ x csho$_t$)) / total assets (at$_t$)
Tangibility$_t$	Net property, plant and equipment (ppent$_t$) / total assets (at$_t$)
Cash$_t$	Cash and short-term investments (che$_t$) / total assets (at$_t$)
Dividend payer dummy$_t$	1 if cash dividends (dvc$_t$) are positive; 0 otherwise
Investment$_t$	Capital expenditures (capx$_t$) / total assets (at$_t$)
Average stock trading volume$_t$	Annual stock trading volume (vol$_t$)
Educational connection	1 if manager/board director of candidate firm graduated from the same school that managers/board directors working in Cboe attended at the same time
Delisting$_t$	1 if annual option trading volume is missing and zero otherwise
Institutional owernship$_t$	Current positions in the company by institutions

$Analyst\ following_t$	The number of analyst following
$News\ coverage_t$	The number of news which relevant score is above 90 covered by the national news media (e.g. Wall Street Journal, The New York Times, The Washington Post, and USA Today)

Appendix B

Table B.I
Option Listing and Capital Structure: Six-year Window

In this table we report the results of *Book leverage, Market leverage, Net debt issue*, and *Net equity issue* for newly listed firms in the six years event window (3 years before and after). The dependent variable is *Book leverage* in models 1 and 2 and *Market leverage* in models 3 and 4, *Net debt issue* in model 5, and *Net equity issue* in model 6. All variables are defined in Appendix A and are winsorized at 1% in both tails of the distribution. We control for firm, year, and industry fixed effects in regressions. Standard errors reported in parentheses are clustered at the firm level. ***, ** , and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Book leverage		Market leverage		Net debt issue	Net equity issue
	OLS	Tobit	OLS	Tobit		
	(1)	(2)	(3)	(4)	(5)	(6)
After	-0.033***	-0.053***	-0.034***	-0.047***	-0.006	0.217***
	(0.008)	(0.009)	(0.006)	(0.006)	(0.015)	(0.042)
Size (t-1)	0.029***	0.048***	0.039***	0.043***	-0.089***	-0.492***
	(0.006)	(0.004)	(0.005)	(0.003)	(0.011)	(0.042)
ROA (t-1)	-0.035***	-0.087***	-0.018***	-0.054***	0.048***	-0.007
	(0.008)	(0.011)	(0.005)	(0.006)	(0.011)	(0.028)
M/B (t-1)	0.002	0.008***	-0.000	-0.002*	0.002	0.082***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)	(0.011)
Tangibility (t-1)	0.095	0.187***	0.065**	0.153***	-0.032	-0.050
	(0.059)	(0.037)	(0.033)	(0.025)	(0.090)	(0.226)
Cash (t-1)	-0.111***	-0.340***	-0.062***	-0.213***	0.091**	-0.852***
	(0.025)	(0.024)	(0.013)	(0.014)	(0.038)	(0.152)
Dividend payer dummy (t-1)	0.009	-0.071***	0.008	-0.059***	0.038***	-0.077***
	(0.010)	(0.012)	(0.008)	(0.008)	(0.014)	(0.030)
Investment (t-1)	0.032	0.031	0.009	0.025	0.088**	-0.071
	(0.025)	(0.028)	(0.015)	(0.019)	(0.037)	(0.100)
Constant	0.023	-0.201***	-0.047**	-0.198***	0.266***	1.919***
	(0.032)	(0.077)	(0.021)	(0.046)	(0.055)	(0.192)
Observations	6,797	6,797	6,797	6,797	6,797	6,797
R^2	0.069		0.139		0.071	0.285
Firm FE	Y	N	Y	N	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Ind FE	N	Y	N	Y	N	N

Table B.II

Cost of Equity and Cost of Debt

In this table we report the mean values of the cost of equity measured by three models (a market model, a three factor model and a four factor model) and the cost of debt. To estimate the cost of equity, we follow Baran and King (2012). Following Frank and Shen (2016), we compute the cost of debt as total interest and related expenses divided by total debt. Like Valta (2012), we also define the cost of debt as the Dealscan data item all-in-spread drawn, which is the amount a borrower pays over the London Interbank Offered Rate (LIBOR) or the LIBOR equivalent for each dollar drawn. All variables are defined in Appendix A and are winsorized at 1% in both tails of the distribution. We measure statistical significance using a t-test for means. ***, ** , and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Cost of equity			
	Before	After	Difference
Market Model	0.4703	0.1368	-0.3335***
Three Factor model	0.4648	0.1319	-0.2984***
Four Factor model	0.4712	0.1287	-0.3426***

Panel B: Cost of debt			
	Before	After	Difference
Cost of Total Debt	0.4223	0.6885	0.2661
All-in-Spread Drawn	0.0231	0.0238	0.0007

Table B.III

Change in Information Asymmetry around Option Listing

In this table we report the results of analyses of change in information environment around option listing. The dependent variables are *PIN, Log (Analyst following)*, and *Institutional ownership*. All variables are defined in Appendix A and are winsorized at 1% in both tails of the distribution. We control for firm fixed effects and year fixed effects in all regressions. Standard errors reported in parentheses are clustered at the firm level. ***, ** , and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	PIN	Log(Analyst following)	Institutional ownership
	(1)	(2)	(3)
After	-0.063***	0.303***	0.056***
	(0.004)	(0.028)	(0.008)
Size (t-1)	-0.019***	0.402***	0.103***
	(0.002)	(0.019)	(0.005)
ROA (t-1)	-0.010***	0.158***	0.032***
	(0.002)	(0.020)	(0.005)
M/B (t-1)	-0.008***	0.067***	0.017***
	(0.000)	(0.005)	(0.001)
Tangibility (t-1)	0.013	-0.066	0.054
	(0.015)	(0.139)	(0.037)
Cash (t-1)	0.002	0.182**	0.049**
	(0.008)	(0.071)	(0.019)
Dividend payer dummy (t-1)	-0.007	0.069*	0.012
	(0.005)	(0.039)	(0.012)
Investment (t-1)	-0.013	0.208***	-0.043**
	(0.008)	(0.076)	(0.019)
Constant	0.311***	-0.799***	-0.468***
	(0.012)	(0.145)	(0.027)
Observations	7,921	9,272	10,966
R^2	0.657	0.780	0.857
Firm FE	Y	Y	Y
Year FE	Y	Y	Y

Figure 1

Cost of Equity of Newly listed Stocks around Option Listing

This figure presents the cost of equity of firms newly listed to the option market using the monthly stock returns by three factor models (CAPM, Three-factor model, and Four-factor model) in the 6-year sample window. The horizontal axis represents a time period T relative to the option listing. For example, T=0 indicates a year a firm is newly listed to the option market and T=-1 (T=1) indicates a year previous to (following) the listing year, and so on. The vertical axis represents implied the cost of equity estimated following Baran and King (2012).

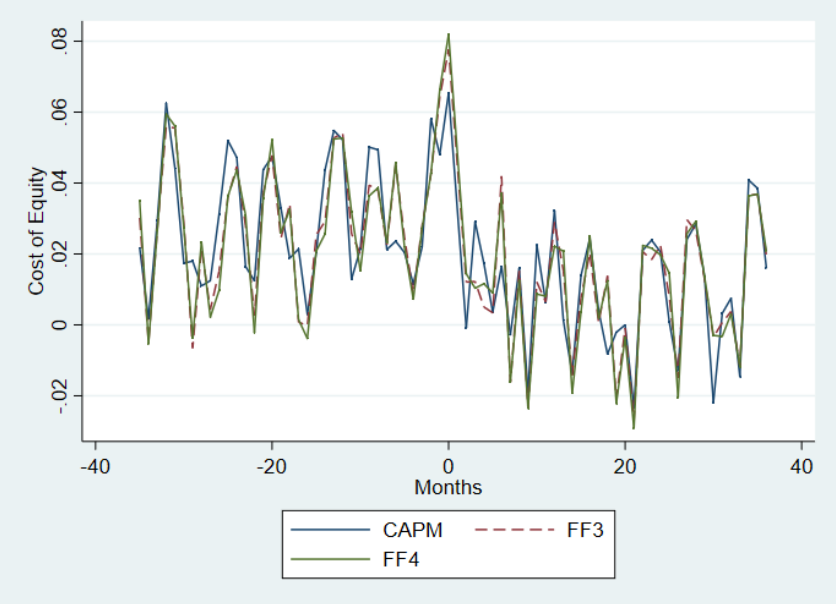
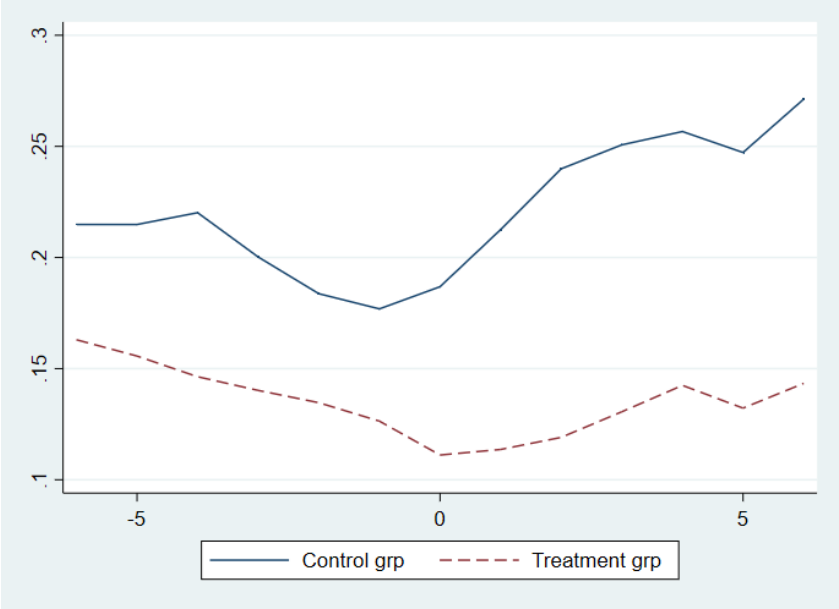


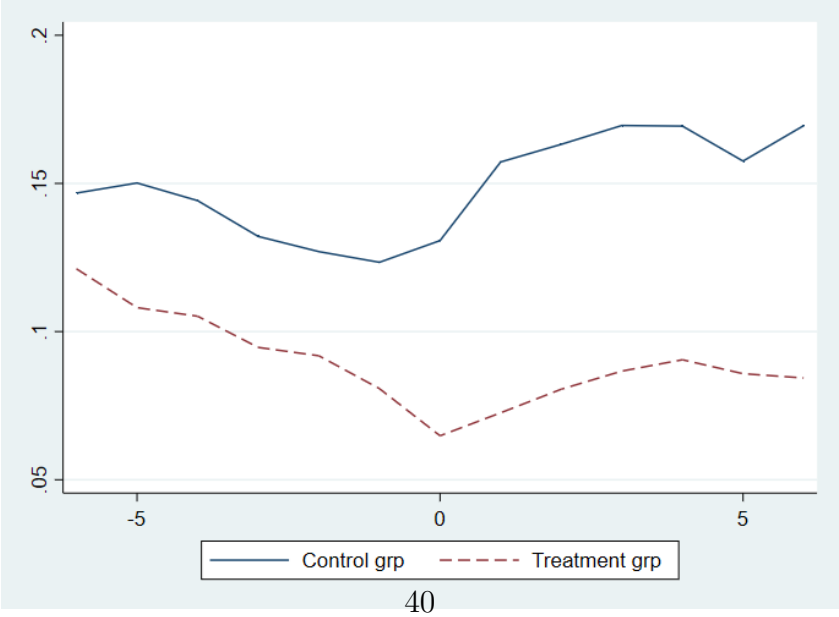
Figure 2

Change in Leverage around Option Listing

This figure presents the book and market leverage of firms newly listed to the option market and their peers matched by stock return volatility, stock trading, market capitalization, and asset growth. The horizontal axis (T) represents a time period relative to the option listing. For example, T=0 indicates a year a firm is newly listed to the option market and T=-1 (T=1) indicates a year prior to (following) the listing year, and so on. The vertical axis represents book leverage ratio and market leverage ratio in Panels A and B, respectively. The blue solid line plots leverage of listed firms, whereas the red dotted line plots leverage of listed firms' industry peers, which are defined as firms that are matched within the same two-digit SIC code.



Panel A: Book leverage



Panel B: Market leverage

Figure 3

Change in Information Environment around Option Listing

This figure presents PIN, Institutional ownership, analyst following of firms newly listed to the option market. The horizontal axis (T) represents a time period relative to the option listing. For example, T=1 indicates a year a firm is newly listed to the option market and T=0 (T=2) indicates a year previous to (following) T=1, and so on. The vertical axis represents PIN and analyst following around option listing. The blue solid line plots PIN of listed firms, whereas the red dotted line plots Analyst following of listed firms.

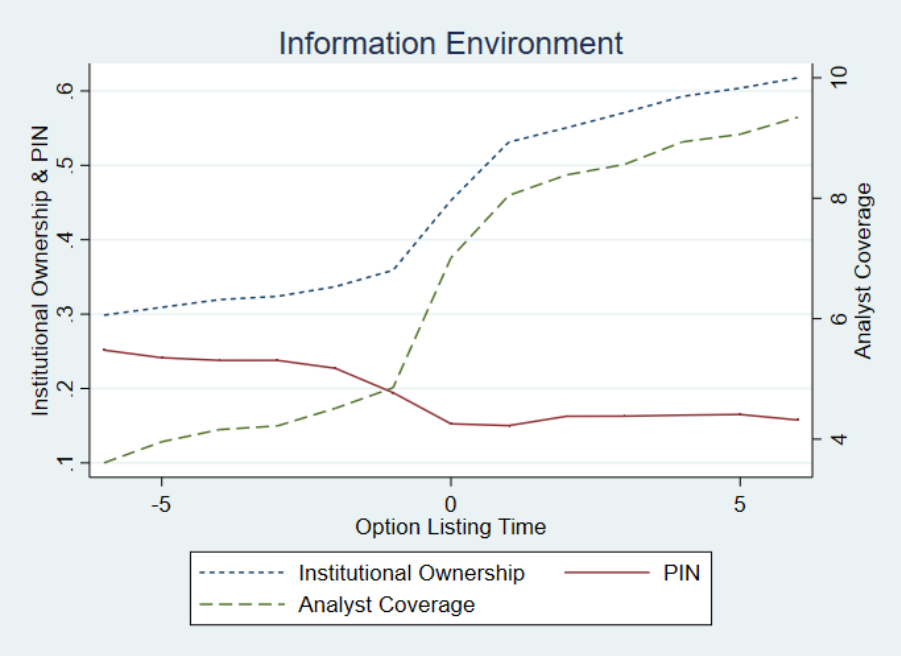


Table I
Summary Statistics

In this table we report summary statistics for the sample firms. Our sample consists of firms that are listed to the option market for the first time between 1999 and 2017. We exclude firms that operate in the financial services (SIC codes 6000-6999) and utilities (SIC codes 4900-4999) industries. For each event of option listing, we form an event-time panel with eleven years event window, starting five years before the event and ending five years after the event. We define T as a time period relative to option listing. For example, T=0 is the year in which a firm is listed to the option market and T=-1 (T=1) is a year prior to (following) the listing year, and so on. T is assigned an integer value between -6 and 5. The pre-addition period is defined as T=(-6, -2) the post-addition period is defined as T=(0, 5). All variables are defined in Appendix A and are winsorized at 1% in both tails of the distribution. ***, ** , and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Total				Before				After				Difference	p value
	N	mean	p50	sd	N	mean	p50	sd	N	mean	p50	sd		
Book leverage	11,311	0.190	0.105	0.231	3,663	0.208	0.142	0.233	7,648	0.182	0.086	0.229	-0.025***	0.000
Market leverage	11,311	0.131	0.056	0.169	3,663	0.150	0.081	0.176	7,648	0.122	0.044	0.165	-0.028***	0.000
Net equity issue	11,311	0.156	0.004	0.616	3,663	0.149	0.003	0.639	7,648	0.159	0.004	0.604	0.011	0.403
Net debt issue	11,311	0.041	0	0.207	3,663	0.042	0	0.226	7,648	0.040	0	0.197	-0.002	0.691
Size	11,311	5.171	5.217	1.457	3,663	4.552	4.586	1.509	7,648	5.467	5.459	1.334	0.915***	0.000
ROA	11,311	-0.114	0.020	0.541	3,663	-0.102	0.028	0.528	7,648	-0.119	0.018	0.548	-0.017	0.117
M/B	11,311	2.327	1.501	2.443	3,663	2.055	1.260	2.342	7,648	2.457	1.630	2.479	0.401***	0.000
Tangibility	11,311	0.227	0.142	0.229	3,663	0.250	0.172	0.231	7,648	0.215	0.127	0.227	-0.035***	0.000
Cash	11,311	0.275	0.172	0.277	3,663	0.215	0.102	0.254	7,648	0.304	0.211	0.284	0.088***	0.000
Dividend payer dummy	11,311	0.190	0	0.392	3,663	0.222	0	0.415	7,648	0.175	0	0.380	-0.047***	0.000
Investment	11,311	0.083	0.038	0.136	3,663	0.086	0.041	0.145	7,648	0.081	0.037	0.132	-0.005*	0.079

Table II
Option Listing and Capital Structure

In this table we report the results of the leverage, net equity issue, and net debt issue for newly listed firms. The dependent variable is *Book leverage* in models 1 and 2 and *Market leverage* in models 3 and 4, *Net debt issue* in model 5, and *Net equity issue* in model 6. *Book leverage* is defined as long-term debt plus debt in current liabilities, divided by total assets. *Market leverage* is defined as long-term debt plus debt in current liabilities, divided by the market value of equity plus total debt. *Net debt issue* is defined as total debt minus lagged total debt scaled by lagged total assets. *Net equity issue* is defined as sales of common and preferred stock minus purchases of common and preferred stock scaled by lagged total assets. *After* is an indicator variable that is assigned a value of one for the post-listing period and zero otherwise. All variables are defined in Appendix A and are winsorized at 1% in both tails of the distribution. We control for firm, year, and industry fixed effects in regressions. Standard errors reported in parentheses are clustered at the firm level. ***, ** , and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Book leverage		Market leverage		Net debt issue	Net equity issue
	OLS	Tobit	OLS	Tobit		
	(1)	(2)	(3)	(4)	(5)	(6)
After	-0.051***	-0.053***	-0.045***	-0.049***	0.003	0.145***
	(0.008)	(0.010)	(0.005)	(0.007)	(0.010)	(0.030)
Size (t-1)	0.029***	0.047***	0.042***	0.041***	-0.062***	-0.292***
	(0.006)	(0.004)	(0.004)	(0.003)	(0.007)	(0.023)
ROA (t-1)	-0.033***	-0.085***	-0.017***	-0.049***	0.044***	-0.004
	(0.006)	(0.009)	(0.003)	(0.005)	(0.006)	(0.016)
M/B (t-1)	0.001	0.009***	-0.002***	-0.004***	0.003	0.092***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.009)
Tangibility (t-1)	0.055	0.168***	0.064**	0.140***	-0.018	-0.070
	(0.044)	(0.034)	(0.027)	(0.024)	(0.056)	(0.140)
Cash (t-1)	-0.152***	-0.355***	-0.095***	-0.232***	0.076***	-0.549***
	(0.020)	(0.023)	(0.011)	(0.013)	(0.025)	(0.099)
Dividend payer dummy (t-1)	-0.012	-0.074***	-0.007	-0.064***	0.038***	-0.035**
	(0.010)	(0.010)	(0.007)	(0.007)	(0.010)	(0.017)
Investment (t-1)	0.026	0.018	0.012	0.021	0.137***	-0.089
	(0.022)	(0.027)	(0.014)	(0.018)	(0.030)	(0.072)
Constant	0.030	-0.230***	-0.048***	-0.205***	0.224***	1.124***
	(0.026)	(0.071)	(0.017)	(0.043)	(0.036)	(0.111)
Observations	11,311	11,311	11,311	11,311	11,311	11,311
R^2	0.741		0.772		0.237	0.488
Pseudo-R^2		0.603		3.754		
Firm FE	Y	N	Y	N	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Ind FE	N	Y	N	Y	N	N

Table III
Instrumental Approach: Educational Connection

In this table we report the results of analyses of change in capital structure using the Instrumental Variable (IV) approach. We consider educational connection of managers/board directors working in the candidate firms as an instrument of option listing. It has one if they graduated the same school that managers or board directors working at Cboe attended at the same time (Cohen, Frazzini, and Malloy, 2008). We use the matched sample between newly listed firms and industry firms that satisfy all the criteria for the option listing. The dependent variables are *Treated*, a binary variable which has one if it is listed, and zero otherwise, *Book leverage, Market leverage, and Net equity issue* in models 1 through 4, respectively. Model 1 is the first step of the IV approach whereas models 2-4 show the results of the second stage regressions. All variables are defined in Appendix A and are winsorized at 1% in both tails of the distribution. We control for firm fixed effects and year fixed effects in all regressions. Standard errors reported in parentheses are clustered at the firm level. ***, ** , and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	1st stage	2nd stage		
		Book leverage	Market leverage	Net equity issue
	(1)	(2)	(3)	(4)
After		-0.184**	-0.266***	0.843***
		(0.090)	(0.074)	(0.218)
Educational connection	0.058***			
	(0.012)			
Size (t-1)	0.157***	0.064***	0.074***	-0.212***
	(0.004)	(0.014)	(0.012)	(0.035)
ROA (t-1)	-0.060***	-0.072***	-0.060***	-0.012
	(0.008)	(0.007)	(0.006)	(0.016)
M/B (t-1)	0.045***	0.015***	0.010***	0.042***
	(0.002)	(0.004)	(0.003)	(0.011)
Tangibility (t-1)	-0.117***	0.174***	0.145***	0.054
	(0.039)	(0.024)	(0.019)	(0.054)
Cash (t-1)	0.286***	-0.136***	-0.071***	-0.293***
	(0.024)	(0.029)	(0.024)	(0.073)
Dividend payer dummy (t-1)	-0.058***	-0.068***	-0.070***	0.026
	(0.015)	(0.009)	(0.008)	(0.020)
Investment (t-1)	0.276***	-0.025	0.016	-0.281***
	(0.038)	(0.033)	(0.027)	(0.086)
Observations	21,075	21,075	21,075	21,075
F-value	208.96	147.54	233.39	79.56
Ind FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y

Table IV
Portfolio Matching

In this table we report the results of analyses of change in capital structure using the matched sample between the newly listed firms and industry firms that satisfy all the criteria for the option listing. The matched industry firms are in the same tercile bins based on stock return volatility, stock trading volume, and market capitalization. They should be in the same industry of the matched newly listed firms. The dependent variables are *Book leverage, Market leverage, Net equity issue* in models 1 through 3, respectively. *Treated* is one if a firm is listed for the first time and zero otherwise. *After* equals one if it is the post-listing period and zero otherwise. All variables are defined in Appendix A and are winsorized at 1% in both tails of the distribution. We control for firm fixed effects and year fixed effects in all regressions. Standard errors reported in parentheses are clustered at the firm level. ***, ** , and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Book leverage	Market leverage	Net equity issue
	(1)	(2)	(3)
*Treated * After*	-0.017**	-0.036***	0.151***
	(0.008)	(0.006)	(0.020)
After	-0.019***	-0.007*	-0.009
	(0.006)	(0.004)	(0.014)
Size (t-1)	0.035***	0.048***	-0.253***
	(0.004)	(0.003)	(0.016)
ROA (t-1)	-0.017***	-0.014***	-0.000
	(0.003)	(0.003)	(0.009)
M/B (t-1)	-0.002*	-0.003***	0.081***
	(0.001)	(0.000)	(0.006)
Tangibility (t-1)	0.175***	0.155***	-0.183**
	(0.027)	(0.019)	(0.079)
Cash (t-1)	-0.091***	-0.058***	-0.559***
	(0.013)	(0.008)	(0.059)
Dividend payer dummy (t-1)	-0.009	-0.002	-0.023**
	(0.006)	(0.005)	(0.011)
Investment (t-1)	0.010	0.005	0.001
	(0.019)	(0.014)	(0.062)
Constant	-0.031*	-0.104***	1.019***
	(0.017)	(0.013)	(0.071)
Observations	21,075	21,075	21,075
R^2	0.735	0.754	0.489
Firm FE	Y	Y	Y
Year FE	Y	Y	Y

Table V
Propensity Score Matching

In this table we report the results of analyses of change in capital structure using matched sample between newly listed firms and industry firms. The matched industry firms are chosen based on all independent variables plust market asset growth rate and year using the nearest-neighbor matchin. The dependent variables in both panels are *Book leverage, Market leverage*, and *Net equity issue* in models 1 through 3, respectively. All variables are defined in Appendix A and are winsorized at 1% in both tails of the distribution. We control for firm fixed effects and year fixed effects in all regressions. Standard errors reported in parentheses are clustered at the firm level. ***, ** , and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Propensity score matching			
	Book leverage	Market leverage	Net equity issue
	(1)	(2)	(3)
*Treated * After*	-0.075***	-0.049***	0.200***
	(0.024)	(0.013)	(0.051)
After	0.023	0.026**	-0.080
	(0.019)	(0.011)	(0.057)
Size (t-1)	0.038***	0.043***	-0.206***
	(0.014)	(0.007)	(0.034)
ROA (t-1)	-0.034***	-0.016***	-0.013
	(0.012)	(0.006)	(0.030)
M/B (t-1)	0.001	-0.003	0.120***
	(0.004)	(0.002)	(0.025)
Tangibility (t-1)	0.188**	0.181***	-0.565
	(0.090)	(0.050)	(0.539)
Cash (t-1)	0.006	-0.041**	-0.353*
	(0.040)	(0.019)	(0.190)
Dividend payer dummy (t-1)	0.009	-0.006	-0.062*
	(0.016)	(0.012)	(0.036)
Investment (t-1)	-0.114	-0.044	-0.400*
	(0.078)	(0.038)	(0.215)
Constant	0.237***	0.063***	0.459***
	(0.044)	(0.024)	(0.164)
Observations	2,306	2,306	2,306
R^2	0.728	0.699	0.479
Firm FE	Y	Y	Y
Year FE	Y	Y	Y

Panel B: Time trends before option listing			
	Book leverage	Market leverage	Net equity issue
	(1)	(2)	(3)
t-4 year x Treated	-0.033	-0.002	-0.077
	(0.025)	(0.016)	(0.115)
t-3 year x Treated	0.021	0.007	-0.140
	(0.025)	(0.018)	(0.091)
t-2 year x Treated	-0.006	-0.000	-0.185
	(0.029)	(0.020)	(0.125)
t-1 year x Treated	-0.036	-0.012	-0.109
	(0.031)	(0.022)	(0.121)
t-4 year	0.010	-0.015	0.061
	(0.021)	(0.010)	(0.047)
t-3 year	-0.045**	-0.039***	0.048
	(0.019)	(0.011)	(0.053)
t-2 year	-0.050**	-0.048***	0.228**
	(0.023)	(0.014)	(0.112)
t-1 year	-0.041	-0.053***	0.294***
	(0.026)	(0.015)	(0.105)
Size (t-1)	0.075***	0.069***	-0.433***
	(0.021)	(0.012)	(0.101)
ROA (t-1)	-0.026**	-0.016***	-0.055
	(0.010)	(0.006)	(0.049)
M/B (t-1)	-0.008**	-0.004	0.112***
	(0.004)	(0.003)	(0.041)
Tangibility (t-1)	-0.167	0.028	-3.372**
	(0.183)	(0.067)	(1.375)
Cash (t-1)	0.005	-0.022	-1.072***
	(0.063)	(0.034)	(0.318)
Dividend payer dummy (t-1)	-0.033	-0.016	-0.125
	(0.022)	(0.018)	(0.083)
Investment (t-1)	0.089	0.045	-0.308
	(0.059)	(0.052)	(0.461)
Constant	-0.072	-0.197***	2.213***
	(0.104)	(0.052)	(0.425)
Observations	1,001	1,001	1,001
R-squared	0.841	0.842	0.595
Firm FE	Y	Y	Y
Year FE	Y	Y	Y

Table VI
Option Listing and Capital Structure by Profitability

In this table we report the results of analyses of change in capital structure. The dependent variables are *Book leverage, Market leverage, and Net equity issue*. *Negative (positive) ROA* indicates those firms with negative (positive) ROA. All variables are defined in Appendix A and are winsorized at 1% in both tails of the distribution. We control for firm fixed effects and year fixed effects in all regressions. Standard errors reported in parentheses are clustered at the firm level. ***, ** , and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Negative ROA			Postive ROA		
	Book leverage	Market leverage	Net equity issue	Book leverage	Market leverage	Net equity issue
	(1)	(2)	(3)	(4)	(5)	(6)
After	-0.109***	-0.053***	0.481***	-0.015**	-0.031***	0.025
	(0.020)	(0.010)	(0.086)	(0.007)	(0.006)	(0.020)
Size (t-1)	0.030***	0.039***	-0.436***	0.032***	0.045***	-0.145***
	(0.010)	(0.006)	(0.039)	(0.007)	(0.005)	(0.022)
ROA (t-1)	-0.029***	-0.007*	0.005	-0.039***	-0.037***	-0.022
	(0.007)	(0.004)	(0.023)	(0.010)	(0.007)	(0.016)
M/B (t-1)	0.005***	0.000	0.098***	-0.006***	-0.007***	0.037***
	(0.002)	(0.001)	(0.013)	(0.001)	(0.001)	(0.010)
Tangibility (t-1)	0.035	0.043	-0.028	0.043	0.065**	0.169
	(0.069)	(0.038)	(0.256)	(0.046)	(0.031)	(0.144)
Cash (t-1)	-0.154***	-0.097***	-0.669***	-0.127***	-0.073***	-0.309***
	(0.031)	(0.017)	(0.161)	(0.028)	(0.016)	(0.085)
Dividend payer dummy (t-1)	-0.017	-0.020	-0.076	-0.001	-0.001	-0.021*
	(0.021)	(0.015)	(0.059)	(0.010)	(0.007)	(0.012)
Investment (t-1)	-0.027	-0.018	-0.049	0.104***	0.057***	-0.008
	(0.039)	(0.020)	(0.117)	(0.023)	(0.019)	(0.091)
Constant	0.004	-0.051	1.942***	0.036	-0.055***	0.482***
	(0.064)	(0.037)	(0.236)	(0.028)	(0.021)	(0.072)
Observations	4,711	4,711	4,711	6,600	6,600	6,600
R^2	0.754	0.827	0.532	0.814	0.808	0.587
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Table VII
Information Production Channel

In this table we report the results of analyses of change in capital structure through information channel. The dependent variables are *Book leverage, Market leverage*, and *Net equity issue*. For three panels, sample firms are categorized into high and low groups based on the number of analysts following, institutional ownership, and news coverage in the year before the listing (T=-1). In particular, *Low (High) Analyst following* in Panel A indicates those firms with the number of analyst followings below (above) the sample median value. *Low (High) institutional ownership* in Panel B indicates those firms with the level of institutional ownership below (above) the sample median value. *Low (High) news coverage* in Panel C indicates those firms with the number of news covered by the four major newspapers (The New York Times, The Wall Street Journal, The Los Angeles Times, and The Washington Post) below(above) the sample median value. All variables are defined in Appendix A and are winsorized at 1% in both tails of the distribution. We control for firm fixed effects and year fixed effects in all regressions. Standard errors reported in parentheses are clustered at the firm level. ***, ** , and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Analyst following						
	Low			High		
	Book leverage	Market leverage	Net equity issue	Book leverage	Market leverage	Net equity issue
	(1)	(2)	(3)	(4)	(5)	(6)
After	-0.060***	-0.051***	0.139***	-0.024**	-0.023***	0.024
	(0.011)	(0.008)	(0.044)	(0.011)	(0.008)	(0.028)
Size (t-1)	0.025***	0.040***	-0.333***	0.019**	0.040***	-0.198***
	(0.008)	(0.005)	(0.044)	(0.010)	(0.006)	(0.028)
ROA (t-1)	-0.038***	-0.018***	-0.019	-0.036***	-0.026***	0.005
	(0.008)	(0.004)	(0.024)	(0.011)	(0.006)	(0.011)
M/B (t-1)	0.000	-0.002**	0.092***	0.001	-0.003**	0.077***
	(0.002)	(0.001)	(0.014)	(0.003)	(0.001)	(0.015)
Tangibility (t-1)	0.032	0.100***	-0.394*	0.126	0.076*	0.040
	(0.059)	(0.037)	(0.238)	(0.092)	(0.044)	(0.157)
Cash (t-1)	-0.152***	-0.089***	-0.644***	-0.156***	-0.087***	-0.309***
	(0.025)	(0.016)	(0.156)	(0.040)	(0.019)	(0.099)
Dividend payer dummy (t-1)	-0.011	-0.002	-0.018	-0.008	-0.012	-0.046**
	(0.011)	(0.010)	(0.028)	(0.014)	(0.011)	(0.019)
Investment (t-1)	0.040	0.032	0.086	0.011	-0.006	-0.070
	(0.038)	(0.021)	(0.131)	(0.032)	(0.026)	(0.072)
Constant	0.046	-0.052**	1.370***	0.100*	0.024	0.854***
	(0.035)	(0.022)	(0.185)	(0.061)	(0.029)	(0.116)
Observations	4,686	4,686	4,686	4,222	4,222	4,222
R^2	0.796	0.760	0.494	0.796	0.806	0.504
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Panel B: Institutional ownership						
	Low			High		
	Book leverage	Market leverage	Net equity issue	Book leverage	Market leverage	Net equity issue
	(1)	(2)	(3)	(4)	(5)	(6)
After	-0.067***	-0.057***	0.287***	-0.018**	-0.023***	0.036*
	(0.013)	(0.008)	(0.065)	(0.009)	(0.007)	(0.020)
Size (t-1)	0.015*	0.035***	-0.366***	0.043***	0.052***	-0.166***
	(0.009)	(0.005)	(0.039)	(0.009)	(0.006)	(0.028)
ROA (t-1)	-0.030***	-0.016***	-0.021	-0.035***	-0.028***	0.011
	(0.008)	(0.005)	(0.026)	(0.009)	(0.006)	(0.008)
M/B (t-1)	0.001	-0.001*	0.098***	-0.005*	-0.006***	0.073***
	(0.002)	(0.001)	(0.013)	(0.002)	(0.002)	(0.013)
Tangibility (t-1)	0.020	0.035	0.027	0.096*	0.078*	0.019
	(0.065)	(0.035)	(0.206)	(0.053)	(0.041)	(0.148)
Cash (t-1)	-0.132***	-0.073***	-0.551***	-0.163***	-0.111***	-0.345***
	(0.026)	(0.014)	(0.149)	(0.030)	(0.019)	(0.109)
Dividend payer dummy (t-1)	0.008	0.003	-0.053	-0.026*	-0.014	-0.025**
	(0.014)	(0.010)	(0.043)	(0.014)	(0.010)	(0.012)
Investment (t-1)	0.049	0.008	-0.012	0.031	0.019	0.024
	(0.033)	(0.018)	(0.103)	(0.037)	(0.028)	(0.095)
Constant	0.070**	-0.026	1.221***	-0.000	-0.057*	0.759***
	(0.036)	(0.021)	(0.167)	(0.043)	(0.032)	(0.135)
Observations	4,387	4,387	4,387	5,676	5,676	5,676
R^2	0.703	0.751	0.488	0.770	0.771	0.435
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Panel C: News coverage						
	Low			High		
	Book leverage	Market leverage	Net equity issue	Book leverage	Market leverage	Net equity issue
	(1)	(2)	(3)	(4)	(5)	(6)
After	-0.043***	-0.039***	0.155***	-0.032	-0.050***	-0.042
	(0.008)	(0.005)	(0.030)	(0.022)	(0.017)	(0.071)
Size (t-1)	0.028***	0.043***	-0.280***	0.015	0.030***	-0.320***
	(0.007)	(0.004)	(0.026)	(0.015)	(0.010)	(0.055)
ROA (t-1)	-0.036***	-0.022***	0.017*	-0.006	-0.011	-0.224**
	(0.006)	(0.004)	(0.010)	(0.011)	(0.009)	(0.103)
M/B (t-1)	0.000	-0.002***	0.091***	-0.003	-0.003	0.105***
	(0.001)	(0.001)	(0.010)	(0.004)	(0.002)	(0.017)
Tangibility (t-1)	0.059	0.073**	0.097	0.096	0.007	-0.655
	(0.046)	(0.030)	(0.128)	(0.161)	(0.065)	(0.463)
Cash (t-1)	-0.144***	-0.091***	-0.389***	-0.132*	-0.080**	-1.373***
	(0.021)	(0.012)	(0.092)	(0.069)	(0.032)	(0.446)
Dividend payer dummy (t-1)	-0.014	-0.008	-0.048***	-0.016	-0.015	0.037
	(0.011)	(0.008)	(0.018)	(0.020)	(0.017)	(0.054)
Investment (t-1)	0.040*	0.008	-0.082	-0.082	0.015	0.280
	(0.024)	(0.015)	(0.068)	(0.103)	(0.059)	(0.309)
Constant	0.033	-0.047**	1.013***	0.148	0.014	1.666***
	(0.027)	(0.019)	(0.112)	(0.095)	(0.053)	(0.324)
Observations	9,697	9,697	9,697	1,085	1,085	1,085
R^2	0.78	0.765	0.488	0.795	0.823	0.530
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Table VIII
Information Environment Channel

In this table, we report the results of analyses of change in capital structure through the information environment channel. The dependent variables are *Book leverage, Market leverage*, and *Net equity. High (Low) dollar trading volume* indicates those firms with dollar option trading volume above (below) the sample median value. All variables are defined in Appendix A and are winsorized at 1% in both tails of the distribution. We control for firm fixed effects and year fixed effects in all regressions. Standard errors reported in parentheses are clustered at the firm level. ***, ** , and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	High dollar trading volume			Low dollar trading volume		
	Book leverage	Market leverage	Net equity issue	Book leverage	Market leverage	Net equity issue
	(1)	(2)	(3)	(4)	(5)	(6)
After	-0.082***	-0.073***	0.222***	-0.031***	-0.027***	0.086***
	(0.014)	(0.008)	(0.060)	(0.009)	(0.006)	(0.030)
Size (t-1)	0.039***	0.047***	-0.341***	0.018**	0.040***	-0.236***
	(0.008)	(0.005)	(0.034)	(0.009)	(0.005)	(0.029)
ROA (t-1)	-0.030***	-0.015***	-0.013	-0.036***	-0.019***	0.003
	(0.009)	(0.005)	(0.029)	(0.007)	(0.004)	(0.012)
M/B (t-1)	-0.000	-0.002**	0.101***	0.003	-0.002**	0.073***
	(0.002)	(0.001)	(0.011)	(0.002)	(0.001)	(0.014)
Tangibility (t-1)	0.080	0.071*	0.073	0.032	0.062*	-0.205
	(0.064)	(0.040)	(0.228)	(0.058)	(0.035)	(0.152)
Cash (t-1)	-0.111***	-0.081***	-0.663***	-0.197***	-0.108***	-0.425***
	(0.027)	(0.016)	(0.143)	(0.029)	(0.016)	(0.130)
Dividend payer dummy (t-1)	-0.005	0.002	-0.061*	-0.017	-0.013	-0.027*
	(0.013)	(0.011)	(0.034)	(0.013)	(0.008)	(0.015)
Investment (t-1)	0.072**	0.042**	-0.195**	-0.034	-0.030*	0.074
	(0.032)	(0.020)	(0.092)	(0.030)	(0.017)	(0.123)
Constant	-0.024	-0.083***	1.299***	0.079	-0.029	1.141***
	(0.035)	(0.024)	(0.165)	(0.060)	(0.040)	(0.147)
Observations	5,199	5,199	5,199	6,112	6,112	6,112
R^2	0.704	0.745	0.504	0.778	0.797	0.467
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Table IX
Investor Awareness Channel

In this table, we report the results of analyses of change in capital structure through investor awareness channel using the newly listed firms on the option market for the first time but are later delisted. The dependent variables are *Book leverage, Market leverage*, and *Net equity issue*. *Delisting* equals one if annual option trading volume is missing after the initial option listing and zero otherwise. All variables are defined in Appendix A and are winsorized at 1% in both tails of the distribution. We control for firm fixed effects and year fixed effects in all regressions. Standard errors reported in parentheses are clustered at the firm level. ***, ** , and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.
.

	PIN	Book leverage	Market leverage	Net equity issue
	(1)	(2)	(3)	(4)
Delisting	0.039***	0.012	0.020***	-0.080***
	(0.004)	(0.012)	(0.006)	(0.027)
Size (t-1)	-0.028***	-0.028*	0.023***	-0.248***
	(0.003)	(0.015)	(0.005)	(0.034)
ROA (t-1)	-0.004***	-0.013**	-0.001	0.008*
	(0.001)	(0.005)	(0.002)	(0.004)
M/B (t-1)	-0.007***	0.013***	-0.000	0.062***
	(0.001)	(0.004)	(0.001)	(0.015)
Tangibility (t-1)	-0.037	0.078	0.129***	0.283
	(0.025)	(0.107)	(0.042)	(0.285)
Cash (t-1)	0.001	-0.168***	-0.066***	-0.323**
	(0.011)	(0.050)	(0.019)	(0.147)
Dividend payer dummy (t-1)	-0.015**	-0.008	-0.002	0.007
	(0.007)	(0.018)	(0.010)	(0.025)
Investment (t-1)	0.004	-0.073	0.030	-0.037
	(0.014)	(0.059)	(0.027)	(0.165)
Constant	0.299***	0.293***	-0.029	1.303***
	(0.019)	(0.082)	(0.032)	(0.175)
Observations	2,622	4,388	4,388	4,388
R^2	0.666	0.642	0.745	0.386
Firm FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y

Table X
Cash Holdings and Investments after Option Listing

In this table, we report the results of consequence of option listing for newly listed firms relative to industry firms that satisfy all the criteria for the option listing. The dependent variables are *Cash, Investment*, and *Complete # of mergers* in Panel A. We run models 1-3 using the option listed firm and models 4-6 using both the option listed firms (treatment group) and their industry peers (control group). Panel B presents the use of proceeds from SEOs around option listing. Panel C reports the proportion of payment method used in acquisitions. In Panel D, we repeat the analysis in Panel A by institutional ownership. All variables are defined in Appendix A and are winsorized at 1% in both tails of the distribution. We control for firm fixed effects and year fixed effects in all regressions. Standard errors reported in parentheses are clustered at the firm level. ***, ** , and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A						
	Cash	Investment	Complete # of mergers	Cash	Investment	Complete # of mergers
	Treatment group			Both groups		
	(1)	(2)	(3)	(4)	(5)	(6)
*Treated * After*				0.013*	0.015***	0.105***
				(0.007)	(0.002)	(0.020)
After	0.039***	0.020***	0.066**	0.011**	0.004*	-0.065***
	(0.007)	(0.004)	(0.030)	(0.005)	(0.002)	(0.019)
Size (t-1)	-0.025***	-0.015***	-0.018	-0.023***	-0.014***	-0.033***
	(0.005)	(0.002)	(0.013)	(0.004)	(0.002)	(0.010)
ROA (t-1)	0.004	0.012***	0.065***	-0.007***	0.009***	0.072***
	(0.003)	(0.002)	(0.014)	(0.002)	(0.001)	(0.009)
M/B (t-1)	0.005***	0.006***	0.011***	0.008***	0.004***	0.012***
	(0.001)	(0.001)	(0.003)	(0.001)	(0.000)	(0.002)
Tangibility (t-1)	-0.291***	-0.055**	-0.152*	-0.362***	-0.037***	-0.087
	(0.035)	(0.021)	(0.084)	(0.023)	(0.014)	(0.059)
Dividend payer dummy (t-1)	-0.001	0.002	0.068*	-0.012**	0.001	0.078***
	(0.008)	(0.003)	(0.036)	(0.006)	(0.002)	(0.027)
Constant	0.354***	0.067***	0.402***	0.363***	0.034***	0.387***
	(0.025)	(0.014)	(0.078)	(0.017)	(0.009)	(0.053)
Observations	11,302	11,302	11,302	21,065	21,065	21,065
R^2	0.845	0.661	0.388	0.847	0.658	0.359
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y

Panel B: Use of Proceeds				
	Before option listing		After option listing	
Primary Use of Proceeds	Freq.	Percent (%)	Freq.	Percent (%)
General corp. purp.	159	67.66	943	53.07
Secondary	33	14.04	472	26.56
Investment-related financing	17	7.23	171	9.62
Debt-related financing	14	5.96	46	2.59
Working capital	6	2.55	75	4.22
Others	12	5.11	145	8.16
Total	235	100.00	1,777	100.00

Panel C: Source for Acquisition				
2 years window				
	Before	After	Difference	p-value
Cash financing	0.203	0.163	-0.040	0.075
Equity financing	0.054	0.169	0.114	0.000
Broad cash financing	0.319	0.330	0.011	0.692
Broad equity financing	0.170	0.335	0.165	0.000
6 years window				
Cash financing	0.176	0.220	0.044	0.006
Equity financing	0.080	0.121	0.040	0.001
Broad cash financing	0.303	0.366	0.064	0.001
Broad equity financing	0.207	0.267	0.060	0.000
10 years window				
Cash financing	0.193	0.240	0.047	0.001
Equity financing	0.082	0.098	0.017	0.090
Broad cash financing	0.314	0.377	0.063	0.000
Broad equity financing	0.203	0.236	0.033	0.019

Panel D: Institutional Ownership						
	Cash		Investment		Complete # of mergers	
	Low	High	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)
After	0.074***	0.001	0.026***	0.010**	0.153***	-0.012
	(0.013)	(0.007)	(0.007)	(0.004)	(0.041)	(0.044)
Size (t-1)	-0.024***	-0.031***	-0.012***	-0.018***	-0.011	-0.026
	(0.007)	(0.007)	(0.003)	(0.004)	(0.017)	(0.024)
ROA (t-1)	0.007	-0.001	0.012***	0.012***	0.074***	0.066***
	(0.006)	(0.004)	(0.003)	(0.003)	(0.021)	(0.022)
M/B (t-1)	0.005***	0.008***	0.005***	0.008***	0.008**	0.027***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.004)	(0.008)
Tangibility (t-1)	-0.235***	-0.379***	-0.064**	-0.024	-0.226*	-0.023
	(0.052)	(0.048)	(0.031)	(0.032)	(0.116)	(0.151)
Dividend payer dummy (t-1)	-0.009	0.001	0.012	-0.005	0.106*	0.042
	(0.014)	(0.009)	(0.008)	(0.003)	(0.062)	(0.047)
Constant	0.390***	0.385***	0.043**	0.160***	0.431***	0.345*
	(0.033)	(0.042)	(0.018)	(0.024)	(0.092)	(0.191)
Observations	4,380	5,683	4,372	5,682	4,380	5,683
R^2	0.812	0.863	0.593	0.690	0.437	0.350
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y