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Effects of Capital Market Access on Target Leverage and Adjustment: Empirical Analysis of Public and Private Firms in Korea*

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This paper examines how a firm's access to different types of financing sources in capital markets affects its target leverage and the speed of adjustment to the target. Public equity (listed stock) and market-based debt (bond) are mainly taken into account as two main sources of capital of interest. Using a large data set of public and private firms in Korea, we classify the firms according to whether they have access to public equity (listed stock) and market-based debt (bond) in the capital markets. As the imbalance in number of observations and heterogeneity between public and private firms are substantial, we conduct empirical analyses with the matched sample as well as with the full sample. The findings of our paper show that different types of capital sources can have different implications on the firm's target leverage, adjustment, and financing activities. A public firm tends to have lower leverage and adjusts to its target leverage faster than a private firm in Korea. A firm with access to bond market is shown to have higher leverage and adjusts faster to its target leverage than that without such access, regardless of whether the firms are public or private. Our paper also provides the findings that a public firm exercises more active issuance and retirement of capital than a private firm and that a firm with access to bond market, regardless of whether a firm is public or private, exercises more active issuance and retirement of capital than that without such access. This paper contributes to the literature on capital structure by integrating different types of capital sources in a single empirical framework and by providing new empirical findings based on the analysis of matched sample as well as full sample.

JEL Classification: D81, G23, G24, G31, G32
Keywords: capital market access, capital structure, public and private firms, target leverage, speed of adjustment

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1. INTRODUCTION

In an effort to lower the costs of capital, many firms endeavor to diversify their financing sources and seek expanded access to capital markets. One of the most central questions in corporate finance research is how firms make their financing choices. Since the seminal work of Modigliani and Miller (1958), a lot of scholars have conducted both theoretical and empirical research dealing with the question of what determines a company's capital structure. The empirical literature on capital structure has focused mostly on publicly traded (listed in stock exchange) firms, mainly due to limitation in data for private firms.

The three primary theories of capital structure are tradeoff (e.g., Modigliani and Miller, 1963; Deangelo and Masulis, 1980), pecking order (e.g., Myers and Majluf, 1984), and market timing (e.g., Baker and Wurgler, 2002) theories. Empirical studies on capital structure either directly test the theories or analyze the implications of theories in diverse empirical settings. Fundamental questions in capital structure research include, but are not limited to, the following: "Does a firm targets optimal leverage ratio?", "What are the determinants of such leverage target?", and "How quickly does a firm adjust to its target leverage?". Although virtually all research upholds the existence of leverage targets (e.g., Hovakimian et al., 2001; Faulkender et al., 2012; Frank and Goyal, 2009), the optimal level of leverage and the speed of adjusting toward a leverage target is empirically found to be heterogeneous across individual firms. It is worth noting that the tradeoff theory and many of the related empirical studies focus on demand side determinants of capital structure (such as profitability, growth opportunities, and tax benefits), thereby implicitly assuming perfectly elastic supply of capital (e.g., Faulkender and Petersen, 2006; Graham and Leary, 2011). However, a stream of research recognizes the role of supply factors in determining firms' capital structure (e.g., Faulkender and Petersen, 2006; Brav, 2009; Goyal et al., 2011). In particular, Faulkender and Petersen (2006) use access to public bond markets, proxied by the existence of a credit rating, as a supply curve shifter. They find that rated firms have substantially higher leverage levels than unrated firms because access to public bond markets significantly lowers the cost of debt financing for rated firms. Brav (2009) find that the leverage ratios of private firms are significantly higher than those of public firms. This difference in observed leverage ratios between public and private firms is primarily related to differential costs of public and private equity capital. Because of substantially higher cost of private equity than that of public equity, private firms have to resort to debt financing almost exclusively while public firms do not have to do so.

The goal of this paper is to investigate how access to different types of financing sources in capital markets affects the firm's target leverage and the speed of adjustment (hereafter SOA) to a target. In Brav (2009), both public and private firms are analyzed, but only access to the public equity market is considered. In Faulkender and Petersen (2006), public firm's access to the bond market is examined only for public firms. Our paper contributes to the growing literature about supply side effects on capital structure by extending previous studies such as Faulkender and Petersen (2006) and Brav (2009). Specifically, we take into account the two sources of financing in the capital markets, i.e., public equity (listed stock) and market-based debt (bond), as supply shifting factors which can affect a firm's leverage ratio, i.e., capital structure.

There are well-developed stock markets for public firms (i.e., KOSPI and KOSDAQ markets in Korean Exchange or KRX) in Korea. Capital funded in bond market has been growing and bond market functions as an important source of capital for both public and private firms in Korea. Extending previous studies, we can expand the scope of analysis by encompassing private firms and bond financing

as an important source of capital due to the following grounds. First, we have adequate private firm samples because the majority of private firms are required by law to make disclosure of detailed financial statement information in Korea.[1] Second, we can use the reported amount on the long-term bond account in the balance sheet and/or possession of bond rating offered by credit rating agencies as a proxy for a firm's access to bond market.[2]

In corporate finance area, many studies have increasingly used matching analysis when they compare public and private firms (e.g., Michaely and Roberts, 2012; Saunders and Steffen, 2011; Gao et al., 2013; Asker et al., 2015). As public and private firms differ substantially in many observable firm-level characteristics, it is important to control for these observable differences when we examine the relationship between capital structure and access to capital sources using both public and private firms as sample. In this paper, we use size and industry match following the studies by Gao et al. (2013) and Asker et al. (2015). This paper perhaps examines the issues about capital structure while employing matching method and using both public and private firms in Korea as sample for the first time. This is another contribution of our paper to the capital structure literature.

To examine how access to different types of capital sources affects a firm's target leverage, we employ multiple testing methods explained in detail in section 3. Consistent with previous empirical studies (e.g., Brav, 2009; Goyal et al., 2011), we provide the finding that the target leverage of a firm is negatively related with access to public equity markets. We also provide the finding that the target leverage of a firm is positively related with access to bond market, regardless of whether a firm is public or private. It appears to be new finding to the literature that a firm's access to bond market increases the target leverage of a private firm.

The question of how a firm's access to different types of financing sources in capital markets affects the speed of adjustment (SOA) to its target leverage is examined via a partial adjustment model pioneered by Fischer et al. (1989). To complement the analysis of SOA to a target leverage, we also investigate a firm's capital issuance and retirement decisions using multinomial logit models following previous studies (e.g., Brav, 2009; Dewaelheyns and Van Hulle, 2012). Similar to Brav (2009), we provide the findings that a firm's access to public equity markets (KOSPI and KOSDAQ markets in Korea Exchange or KRX) increases speed of adjustment (SOA) to a target leverage and facilitates active capital issuance or retirement. We also provide the finding that a firm's access to bond market increases speed of adjustment (SOA) to a target leverage and facilitates active capital issuance or retirement of the firm. It appears to be new finding to the literature that a private firm's access to bond market increases both the speed of adjustment to a target leverage and the financing activities.

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1) In Korea, an 'external audit firm' defined in accordance with the 'External Audit Act' refers to a company that must undergo regular accounting audits from an external accounting firm. The criteria for external audit requirement of a firm are as follows: ① a listed company in stock exchanges, i.e., KOSPI and KOSDAQ markets, ② a company that is scheduled to be listed in the current fiscal year or the next fiscal year), ③ and an unlisted company or limited company that meets certain criteria such as ⓐ reported sales of more than KRW 50 billion as of the end of the previous fiscal year, ⓑ total assets exceeding KRW 50 billion as of the end of the previous fiscal year, and ⓒ two or more of the following apply (in the case of a limited company, three or more applying) total assets over KRW 12 billion, total liabilities over KRW 7 billion, total sales over KRW 10 billion, and 100 or more total workers employed.

2) There could be a company that has not reported amount on long-term bond account on balance sheet while possessing credit rating, e.g., Samsung Electronics Corporation in Korea. In contrast, when the information on credit rating of a private firm is not available, the private firm' access to bond market needs to be defined by reported amount on long-term bond account on balance sheet.

The rest of the paper is organized as follows. Section 2 describes related literature and derives testable hypotheses. Section 3 explains the research design and provides a summary of the sample. Section 4 examines the determinants of target leverage. Section 5 examines the effect of a firm's capital market access on its SOA to target leverage. Section 6 examines the effect of capital market access on financing activities. Section 7 concludes.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Access to Financing Sources in Capital Markets

Whether to have access to capital markets or not can significantly affects the cost of debt and equity of the firms. The literature has recognized that the sources of capital can have different implications for a firm's financing cost (e.g., Leland and Pyle, 1977; Diamond, 1984, 1991; Gertner et al., 1994; Faulkender and Petersen, 2006; Brav, 2009).

On the debt side of the capital, opaque firms, due to high information costs, are less likely to borrow from bond market. They typically rely heavily on financial intermediaries such as banks. Financial intermediaries are lenders which have professional specialties in collecting information about borrowers (e.g., Carey, Post, and Sharpe, 1998). Thus, those financial intermediaries may have an advantage over investors in market-based debt (bond) market in screening and monitoring borrower's type and behavior.[3] However, the screening and monitoring by financial intermediaries are costly. These costs are likely to be passed back on to the borrowers, leading to higher borrowing cost (loan interest rate). Therefore, firms without access to bond market tend to incur higher cost of debt than those firms with such access (e.g., Faulkender and Petersen, 2006).

On the equity side of the capital, it is important to note the following points. First, for outside investors, private and public firms differ in the level of information costs. Private firms are less well known and they disclose relatively limited information to financial markets. In contrast, public firms are required to disclose more detailed information to financial markets, and many of the public firms are followed by financial analysts, who make firms' financial and business prospects available to the public. Such difference in information costs should lead to higher equity risk premium for private equity. Second, private and public firms differ in the ownership structure. While public firms have a broad and dispersed shareholder base, private firms typically have ownership concentrated in a few major shareholders. Issuing equity entails dilution of control rights held by the owner-management or the majority shareholder. The cost of dilution should be higher for private equity than for public equity (e.g., Amihud, Lev, and Travlos, 1990; Brav, 2009; Stulz, 1988).

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[3] Empirical studies find that the firms which are riskier, smaller, and less known are those which are most likely to borrow from financial intermediaries (e.g., Cantillo and Wright, 2000; Faulkender, 2005; and Petersen and Rajan, 1994). In contrast, large firms, about which much is known, will be more likely to borrow arm's length transactions in capital markets.

2.2. Leverage Target and Adjustment

Theories of capital structure have differing views on whether a firm has its target leverage. The pecking order and market timing theories asserts that managers do not greatly perceive an effect of changing leverage ratios on the value of a firm, i.e., the firm does not pursue an optimal leverage level (e.g., Myers, 1984; Myers and Majluf, 1984; Baker and Wurgler, 2002). In contrast, the trade-off theory (e.g., Modigliani and Miller, 1963; Deangelo and Masulis, 1980) argues that a firm does target a desired level of leverage (balancing the tax benefits and bankruptcy costs) and make adjustment for achieving its target leverage (e.g., Shyam-Sunder and Myers, 1999). Fischer et al. (1989) developed a model of dynamic capital structure choice (a partial adjustment model) recognizing the existence of market frictions that can cause a firm's leverage to systematically deviate from its target. Many empirical studies employing the partial adjustment model of capital structure in the spirit of Fischer et al. (1989) find that a firm does have a target leverage, but it makes incomplete adjustments toward a target due to adjustment costs such as costs for capital issuance and retirement (e.g., Hovakimian et al., 2001; Leary and Roberts, 2005; Flannery and Rangan, 2006; Huang and Ritter, 2009).

The estimates of SOA vary substantially across previous studies (e.g., Flannery and Rangan, 2006; Huang and Ritter, 2009; Lemmon et al., 2008; Welch, 2004), primarily due to which method is chosen for the analysis. In the literature, several approaches, from standard OLS to more advanced GMM methods, have been proposed for the estimation of dynamic models of capital structure (e.g., Shyam-Sunder and Myers, 1999; Fama and French, 2002; Flannery and Rangan, 2006; Huang and Ritter, 2009; Cook and Tang, 2010; Elsas and Florysiak, 2011; Flannery and Hankins, 2012).[4)]

Previous studies have recognized that speed of adjustment (SOA) to a target leverage are heterogeneous across firms since adjustment costs have firm-specific components (e.g., Leary and Roberts, 2005; Elsas and Florysiak, 2011; Faulkender et al., 2012). These studies find that SOAs are related with adjustment costs and heterogeneous across firm-level characteristics such as asset size, market-to-book ratio, financing deficit (or cash flow), deviation from target leverage, degree of financial constraints, and default risk. The SOAs can also depend on macroeconomic conditions (e.g., Cook and Tang, 2010).

Moreover, as far as the SOA reflects how actively a firm rebalances its leverage to a target, the SOA should be closely related with the financing activities such as issuance or retirement of equity capital (e.g., Brav, 2009) and/or of debt capital (e.g., Dewaelheyns and Van Hulle, 2012).

2.3. Hypothesis Development

It is a fundamental concept in finance that cost of equity is higher than cost of debt due to higher risk premiums for equity. According to Brav (2009), a private firm's relative cost of equity capital to debt capital is higher than that of a public firm. Thus, a firm's access to public equity markets decreases its relative cost of equity to debt, leading to lower leverage ratio of the firm.

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4) Econometrically, estimating dynamic capital structure models in a panel regression framework is challenging because the lagged dependent variable enters the regression equation as a key explanatory variable. The correlation between firm fixed effect and lagged dependent variable makes the coefficient estimates from the standard OLS or panel fixed-effect regression biased (this is known as the 'short-panel bias' because the bias is inversely related to the panel length). Flannery and Hankins (2012) note that "the short panel bias is a significant concern, and questions requiring dynamic panel models constitute some of the most contentious and unresolved areas of financial research."

A firm's access to capital markets also has an implication for its SOA and financing activities, i.e., issuance and/or retirement of equity and/or debt capital. On the one hand, a firm's access to a particular type of capital (public equity or bond) can reduce absolute and relative cost of such capital. In turn, such reduction in the cost of capital can lead to change in the capital structure, SOA, and financing activities of the firm. On the other hand, a firm' access to a particular type of capital (public equity or bond) can provide the firm with stable capacity of financing capital. Then, a firm's capital structure, SOA, and financing activities can be determined by other factors than its access to a particular type of capital. In this case, one cannot predict the changes in leverage, SOA, and financing activities with particular directions.

In this study, we posit empirical hypotheses mainly based on the possibility that a firm's access to a particular type of capital affects its target leverage and speed of adjustment mainly via the changes in absolute and relative costs of capital.

On the equity side of the capital, since a firm's access to public equity markets can reduce cost of equity, other things being equal, both the absolute cost of accessing the public equity markets and the relative cost of equity to debt can be lower for a public firm than for a private firm. We propose Hypothesis 1 (**H1**) as follows:

H1: *Compared to a private firm, a public firm tends to have lower target leverage, adjusta to a target leverage faster, and exercises more active equity issuance and retirement.*

On the debt side of the capital, a firm's access to bond market increases relative cost of equity to debt, leading to higher leverage ratio for the firm. Because a firm's access to bond market can reduce cost of debt, other things being equal, a firm with bond market access can incur lower absolute cost of accessing the capital markets and higher relative cost of equity to debt than that without such access. We propose Hypothesis 2 (**H2**) as follows:

H2: *Compared to a firm without bond market access, a firm with bond market access tends to have higher target leverage, adjusts to a target leverage faster, and exercises more active debt issuance and retirement.*

3. RESEARCH DESIGN AND SAMPLE DESCRIPTIONS

3.1. Data Sources and Sample

The main source of data for both public and private firms is FnGuide database. From FnGuide database, we gather financial statement data, data based on stock price information, data for ownership concentration, and data for credit rating for both public and private firms. Data for expected inflation was collected from website maintained by Bank of Korea.

Following conventional practices, we exclude financial firms, regulated utilities, closed-end funds, and REITS from the sample. Each sample firm must have at least two consecutive years of accounting data to be included in the final sample. Since the earliest year for the data from FnGuide related to member firms of large business groups is 2003, the starting year for the sample is set to 2003. We drop

any firm-years if book assets or sales are negative or missing, if the corporation registration number is missing, or any of the values for the dependent and independent variables appearing in the regression equation are missing. In case of multiple corporation registration numbers for the same firm-year (it may occur due to IPO or delisting), only one firm-year is kept in the sample. The final full sample consists of 155,377 (21,416 public and 133,921 private) firm-year observations for the period of 2003 to 2019.

3.2. Measurement of Variables

Table A.1 provides the detailed definitions of all variables used in this paper. Except for the dummy variables and expected inflation rate, all other variables are winsorized at the 2nd and 98th percentiles to reduce the impact of extreme values.

3.2.1. Measurement of access to capital sources

The key explanatory variables for testing our hypotheses are the following: *PUB* is a dummy variable indicating a firm's access to public equity markets (KOSPI and KOSDAQ markets in Korea Exchange or KRX). It is equal to 1 if a firm is listed on the stock market and 0 otherwise. *BM* is a dummy variable indicating a firm's access to bond market. It is equal to 1 if a firm's balance sheet account named "long-term bonds" has a positive value and/or the firm possesses bond rating(s) granted by credit rating agencies and 0 otherwise.

3.2.2. Measurement of leverage and issuance/retirement of capital

Since market value of equity is not available for private firms, book leverage is used for both public and private firms throughout the analysis. In that no consensus is made in the literature on whether market or book leverage is better to be used, using book leverage should not be a serious concern (e.g., Leary and Robert, 2005; Fama and French, 2002). *LEV* is defined as the ratio of total debt to total assets, following many previous studies (e.g., Brav, 2009). Book value of assets is used to compute total assets. Total debt is the sum of short- and long-term debts.

How fast a firm adjusts toward a target leverage is closely related with the frequency of its capital issuance or retirement decisions. Due to the unavailability of specific data, previous studies identified whether capital issuance or retirement has occurred using balance sheet information only (e.g., Brav, 2009; Hovakimian et al., 2001; Korajczyk and Levy, 2003; Leary and Roberts, 2005, 2010). This paper follows Leary and Roberts (2005), among others, to define issuance or retirement of debt or equity. *ISSUE* is a dummy variable indicating issuance of capital. For the equity capital, *ISSUE* is equal to 1 if the change in issued equity capital divided by beginning-period total assets is greater than 5% and 0 otherwise. For the debt capital, *ISSUE* is equal to 1 if the change in the sum of short- and long-term debts divided by beginning-period total assets is greater than 5% and 0 otherwise. *RETIRE* is a dummy variable indicating retirement of capital. For the equity capital, *RETIRE* is equal to 1 if the change in issued equity capital divided by beginning-period total assets is less than –5% and 0 otherwise. For

the equity capital, *RETIRE* is equal to 1 if the change in the sum of short- and long-term debts divided by beginning-period total assets is less than −5% and 0 otherwise.[5)]

3.2.3. Control variables

In the literature, different sets of control variables have been used to explain cross-sectional variations in leverage ratios (e.g., Fama and French, 2002; Flannery and Rangan, 2006; Hovakimian et al., 2001; Rajan and Zingales, 1995). For instance, Rajan and Zingales (1995) used profit, market-to-book, tangibility, and sales (4 factors). Flannery and Rangan (2006) used profit, market-to-book, depreciation, total assets, tangibility, R&D dummy, R&D expense, credit rating dummy (8 factors). Frank and Goyal (2009) proposed six core factors for the purpose of modeling target leverage: firm size, profitability, market-to-book assets ratio, tangibility, industry median leverage, and expected inflation. They argue that the six core factors have consistent signs and statistical significance across many alternative treatments of data. They also note, however, that the choice of factors is not likely to be crucial because they are highly correlated. We use the six core factors proposed by Frank and Goyal (2009). Since the market-to-book assets ratio represents growth opportunity of a firm while it is not available for a private firm, sales growth rate from the previous year is used instead. Table A.1 summarizes the definitions of the variables used in our paper.

3.3. Econometric Methods

3.3.1. Matching

One main focus of this paper is to examine the difference between public and private firms with respect to target leverages, SOAs, and financing activities. Several studies have investigated potential differences between public and private firms in terms of costs of debt financing (Saunders and Steffen, 2011), cash holding levels (e.g., Gao et al., 2013), investment decisions (e.g., Asker et al., 2015), and dividend payout policies (e.g., Michaely and Roberts, 2012). Since public and private firms differ substantially along many dimensions, these studies analyze the sample by matching public and private firms on one or several of the important firm characteristics. When comparing public and private firms, it is very important to control for firm size appropriately because it has been found that a large firm tends to adjust to its target leverage more slowly than a small firm (e.g., Elsas and Florysiak, 2011; Faulkender et al., 2012). We follow Gao et al. (2013) and Asker et al. (2015) to match public and private firms on asset size and industry in order to control for potential confounding effects arising from other observable differences than the access to public equity (listed stock) and market-based debt (bond) in capital markets.

Details of matching methods are as follows. First, with more than 80% of the firms being private (and the rest being public) in full sample, each public firm is to be matched with a private firm closest in asset size in the same industry. The requirement for matching is that the ratio of their total assets

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5) In Korea, the bulk stock holding reporting system, widely known as the "5% rule" under the Capital Markets Act in Korea, requires an individual (or an institution) who (which) holds more than 5% of stocks of a listed company (including shares held by specially related individuals and joint holders) to report the holding status and purpose of holding to the Financial Services Commission. It is a system that imposes an obligation to report changes to the Financial Services Commission when the total number of stocks held by the stockholders with 5% or more stocks of a listed company changes by more than 1% of the total number of stocks. In our study, in addition to following the previous studies (e.g., Leary and Roberts; 2005), we also incorporate this "5% rule" in defining issuance or retirement of equity capital. Further, we apply the same rule to defining issuance and retirement of debt capital.

(called caliper) is not greater than 1.5.[6] Second, for each of the public firm in the sample, the matching process starts from the earliest fiscal year for that firm. If a match is found for the first year (that meets the industry and asset-size requirements), the matched public-private pair remains in the sample throughout the years unless any of the two firms drops from the sample. In case no match is found or an initial match is broken, a new matching process begins. Third, matching is done with replacement, following many previous studies (e.g., Gao et al., 2013; Asker et al., 2015, among others). Matching with replacement has the benefit of finding closest matches, resulting in high matching quality. The shortcoming is reduced efficiency as fewer distinct observations are used (e.g., Smith and Todd, 2005). Moreover, by matching with replacement, the sample loses a panel structure. The short side of this is that recently developed, more advanced methods for estimating a partial adjustment model, such as Blundel-Bond (1998) GMM estimators or Bruno (2005)'s LSDVC, cannot be applied to our non-panel dataset. This kind of limited methodological choice for analyzing a non-panel data was already noted by Cook and Tang (2010) who condition their sample by a series of macroeconomic variables, not by firm characteristics.

3.3.2. Estimation of the determinants-of-leverage regression

Our primary interest in testing hypotheses is the relation between access to capital markets and the target leverage. Estimating the determinants of target leverage is based on the following regression model:

$$LEV_{i,t+1} = \beta X_{i,t} + F_i + \varepsilon_{i,t+1.} \quad (1)$$

$X_{i,t}$ represents the set of explanatory variables, consisting of the six core factors (*ASSET*, *PROFIT*, *SG*, *TANG*, *INDLEV*, and *EIR*) and a dummy variable indicating capital market access (i.e., *PUB* and *BM*), F_i is a firm-specific fixed-effect, and $\varepsilon_{i,t+1}$ is an error term. All explanatory variables are lagged in one period in order to mitigate potential endogeneity concerns. Following Faulkender and Petersen (2006) and Brav (2009), the determinants-of-leverage regression equation is estimated using both OLS (ignoring the fixed effect) and OLS with firm fixed-effect methods.[7] The standard errors are corrected for both heteroskedasticity and firm-level clustering.

It is worth noting that the dummy variables indicating capital market access (i.e., *PUB* and *BM*) effectively partition the full sample into two subsamples, one consisting of firms having access to capital markets, and the other consisting of firms having no such access. Equation (1) is estimated in two different specifications. In the first specification (pooled coefficient approach), each of the six factors enters the regression without interacting with the dummy variable indicating capital market access. In the second specification (separate coefficient approach), each of the six factors is interacted with the dummy variable indicating capital market access, generating two separate regressors corresponding to each factor, one representing the firms having access to capital markets, and the other representing the

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6) In other words, caliper = $\max(TA_{PUBLIC}, TA_{PRIVATE}) / \min(TA_{PUBLIC}, TA_{PRIVATE}) \leq 1.5$ is required. The overall empirical results do not change qualitatively if a stricter requirement (e.g., caliper ≤ 2) is applied.

7) Since our matched sample is formed by allowing replacement, it is no longer a panel data. In Faulkender and Petersen (2006) and Brav (2009), where they applied panel fixed-effect regression, the data set maintains a panel structure since no matching is done. Econometrically, the OLS with fixed-effect estimator (a.k.a. LSDV estimator) and the panel fixed-effect estimator are exactly the same (Cameron and Trivedi, 2010).

firms having no such access. Separate coefficient approach allows for differential marginal effect of each explanatory variable while pooled coefficent approach does not.

3.3.3. Estimation of the partial-adjustment-of-leverage regression

Does access to capital markets have an effect on the firm's speed of adjusting toward a target leverage? This question is examined via partial adjustment framework (Fischer et al., 1989). A standard partial adjustment model is of the following form:

$$LEV_{i,t+1} - LEV_{i,t} = \lambda(LEV^{*}_{i,t+1} - LEV_{i,t}) + \delta_{i,t+1.} \quad (2)$$

The model assumes that each year the gap between the target leverage ($LEV^{*}_{i,t+1}$) and actual leverage ($LEV_{i,t}$) is closed with a proportion λ. Thus, λ represents the SOA to a target leverage. Substituting the RHS of equation (1) into leverage $LEV^{*}_{i,t+1}$ yields the following reduced-form model:

$$LEV_{i,t+1} = (1-\lambda)LEV_{i,t} + (\lambda\beta)X_{i,t} + \lambda F_i + \varepsilon_{i,t+1.} \quad (3)$$

In order to assess the difference in the SOA between the firms with access to capital markets and those without such access, we add two additional terms into the RHS of equation (3), one is capital market access indicator (i.e., *PUB* and *BM*) and the other is the product of that indicator and *LEV* (i.e., *PUB*×*LEV* and *BM*×*LEV*), with the coefficient estimate on the latter representing the difference in the SOA.

Given the limitations of methodological choice that arise from matching (with replacement), we estimate equation (3) using both OLS (ignoring fixed effect) and pooled OLS with firm fixed-effect methods. The standard errors are corrected for both heteroskedasticity and firm-level clustering. As is the case for estimating equation (1), equation (3) is estimated in two different specifications: one with pooled coefficient approach and the other with separate coefficient approach.

3.3.4. Estimation of capital-issuance-or-retirement regression

As noted earlier in previous section, analyzing the effect of the capital market access on the speed of adjusting (SOA) toward a target leverage can be complemented with directly examining the determinants of the firm's capital issuance or retirement decisions (Brav, 2009). With respect to financial decision making aimed at moving (or not moving) to a target leverage, each firm has three choices: issue capital, retire capital, or do no action. An appropriate econometric tool for examining the determinants of financing activites is the multinomial logit model, and, the no-action alternative is set as the baseline for estimating the model. In the literature, growth opportunities and financing deficits are deemed as major factors, among others, affecting firms' financing decisions (e.g., Frank and Goyal, 2003; Brav, 2009; Leary and Roberts, 2010). In our analysis, we break financing deficits into capital expenditure, working capital investment, and operating cash flows, similar to the approach proposed by Frank and Goyal (2003). As is the case for estimating the partial adjustment regression, the model is estimated in two different specifications: one with pooled coefficient, and the other with separate coefficient approach.

3.4. Summary Statistics

Table 1 reports summary statistics for the full sample analyzed in this paper. Panel A of table 1 compares public and private firms in full sample. Compared to private firms, public firms have lower leverage ratios (public firms 0.218 versus private firms 0.302) and issue capital more frequently (public firms 0.350 versus private firms 0.278). Regarding capital retirements, public firms are slightly less likely to retire capital than private counterparts (public firms 0.142 versus private firms 0.149). Public firms tend to be larger in size and less profitable, have less tangible assets and lower cash flows, and are more likely to have access to bond markets. Panel B (Panel C) of table 1 compares the firms with access to bond markets and those without such access among the public (private) subsample. In Panel B of table 1, compared to public firms without bond market access, public firms with such access have higher leverage ratios (with access 0.317 versus without access 0.175), and issue capital more frequently (with access 0.442 versus without access 0.310), and retire capital more frequently (with access 0.175 versus without access 0.127). In Panel C of table 1, compared to private firms without bond market access, private firms with such access have higher leverage ratios (with access 0.441 versus without access: 0.289), and issue capital more frequently (with access 0.470 versus without access 0.260), but retire capital less frequently (with access 0.132 versus without access 0.151).

Table 1 Summary Statistics: Private versus Public Firms and Firms with versus without Bond Market Access in Full Sample

Panel A: Public and Private Firms

	Public		Private		Difference	
# of obs	21,416		133,921		-	
	Mean	(Median)	Mean	(Median)	Mean	(Median)
LEV	0.218	(0.194)	0.302	(0.288)	–0.084***	(0.094***)
ISSUE	0.350	(0)	0.278	(0)	0.072***	-
RETIRE	0.142	(0)	0.149	(0)	–0.007***	-
ASSET	11.69	(11.44)	10.31	(10.09)	1.38***	(–1.35***)
PROFIT	0.064	(0.066)	0.085	(0.075)	–0.021***	(0.009***)
SG	0.102	(0.055)	0.104	(0.046)	–0.002	(–0.009***)
TANG	0.280	(0.262)	0.361	(0.329)	–0.081***	(0.067***)
INDLEV	0.256	(0.266)	0.288	(0.284)	–0.032***	(0.018***)
EIR	0.033	(0.032)	0.033	(0.032)	0.001***	(0***)
CF	0.068	(0.065)	0.089	(0.075)	–0.021***	(0.01***)
CPX	0.050	(0.024)	0.050	(0.016)	–0.001	(–0.008***)
CNWC	0.018	(0.01)	0.015	(0.005)	0.004***	(–0.005***)
BM	0.305	(0)	0.084	(0)	0.221***	-

Panel B: Public Firms

	With Bond Market Access		Without Bond Market Access		Difference	
# of obs	6,529		14,887		-	
	Mean	(Median)	Mean	(Median)	Mean	(Median)
LEV	0.317	(0.314)	0.175	(0.133)	0.142***	(0.181***)
ISSUE	0.442	(0)	0.310	(0)	0.132***	-
RETIRE	0.175	(0)	0.127	(0)	0.048***	-
ASSET	12.29	(11.89)	11.42	(11.33)	0.87***	(0.56***)
PROFIT	0.048	(0.056)	0.072	(0.071)	–0.024***	(–0.015***)
SG	0.112	(0.054)	0.098	(0.055)	0.014	(–0.001)
TANG	0.290	(0.274)	0.276	(0.257)	0.014***	(0.017***)
INDLEV	0.257	(0.262)	0.256	(0.269)	0.001	(–0.007***)
EIR	0.034	(0.032)	0.033	(0.032)	0.000	(0)
CF	0.053	(0.056)	0.075	(0.069)	–0.022***	(–0.013***)
CPX	0.047	(0.023)	0.051	(0.024)	–0.004***	(–0.001)
CNWC	0.017	(0.008)	0.019	(0.01)	–0.002	(–0.002)
BM	1.000	(1)	0.000	(0)	1.000	-

Panel C: Private Firms

	With Bond Market Access		Without Bond Market Access		Difference	
# of obs	11,189		122,732		-	
	Mean	(Median)	Mean	(Median)	Mean	(Median)
LEV	0.441	(0.456)	0.289	(0.264)	0.152***	(0.192***)
ISSUE	0.470	(0)	0.260	(0)	0.209***	-
RETIRE	0.132	(0)	0.151	(0)	–0.019***	-
ASSET	10.81	(10.39)	10.26	(10.06)	0.55***	(0.33***)
PROFIT	0.081	(0.079)	0.085	(0.075)	–0.005***	(0.004***)
SG	0.113	(0.061)	0.104	(0.045)	0.009***	(0.016***)
TANG	0.359	(0.341)	0.362	(0.327)	–0.003	(0.014***)
INDLEV	0.297	(0.294)	0.287	(0.28)	0.010***	(0.014***)
EIR	0.032	(0.031)	0.033	(0.032)	–0.001***	(–0.001***)
CF	0.088	(0.081)	0.089	(0.074)	–0.001	(0.007***)
CPX	0.062	(0.026)	0.049	(0.015)	0.012***	(0.011***)
CNWC	0.020	(0.012)	0.014	(0.005)	0.006***	(0.007***)
BM	1.000	(1)	0.000	(0)	1.000	-

Notes: This table reports summary statistics of the variables for the full sample. The statistics are based on 21,416 public and 133,921 private firm-year observations spanning the period 2003-2019. See table A.1 for variable definitions. Panel A compares public and private firms in the full sample. Panel B (Panel C) compares firms with access to bond markets and those without such access among the public (private) subsample. The accompanying significant levels for the difference in mean and median are from two-sample *t*-tests of the equality of means and non-parametric tests of the two-sample equality of medians, respectively. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Results reported in table 1 suggest the following points. First, consistent with our conjectures, public firms, regardless of whether they have access to bond market or not, have lower leverage ratios than private firms. Second, firms with access to bond market, regardless of whether they are public or private, have higher leverage ratios than those without such access. Third, compared to private firms, public firms are more likely to issue capital, but they do not retire capital more frequently. Fourth, controlling for access to public equity markets, firms with bond market access are more likely to issue capital than those without such access. However, the effect of bond market access on capital retirement is not so clear; firms with bond market access are more likely to retire capital than those without only in public subsample, but not in private subsample.

Table 2 reports summary statistics for the matched sample (where, for each of the public firm, a private firm is matched on industry and asset size). Due to size matching, asset size of private firms included in matched sample are significantly larger than average asset size of private firms in full sample. Moreover, for matched private firms, frequency of access to bond market increases (full sample 0.084 versus matched sample 0.146); leverage ratios become lower (full sample 0.302 versus matched sample 0.243); likelihood of capital issuance increases (full sample 0.278 versus matched sample 0.312); likelihood of capital retirement decreases (full sample 0.149 versus matched sample 0.119).

Table 2 Summary Statistics: Private versus Public Firms and Firms with versus without Bond Market Access in Matched Sample

Panel A: Public Firms versus Private Firms

	Public		Private		Difference	
# of obs	20,912		20,912		-	
	Mean	(Median)	Mean	(Median)	Mean	(Median)
LEV	0.218	(0.193)	0.243	(0.214)	–0.025***	(–0.021***)
ISSUE	0.352	(0)	0.312	(0)	0.040***	-
RETIRE	0.142	(0)	0.119	(0)	0.022***	-
ASSET	11.61	(11.41)	11.53	(11.37)	0.07***	(0.04***)
PROFIT	0.063	(0.065)	0.104	(0.092)	–0.041***	(–0.027***)
SG	0.102	(0.055)	0.148	(0.074)	–0.046***	(–0.019***)
TANG	0.278	(0.259)	0.307	(0.277)	–0.030***	(–0.018***)
INDLEV	0.256	(0.266)	0.256	(0.266)	0.000	(0)
EIR	0.033	(0.032)	0.033	(0.032)	0.000	(0)
CF	0.067	(0.064)	0.113	(0.095)	–0.046***	(–0.031***)
CPX	0.049	(0.024)	0.059	(0.026)	–0.010***	(–0.002***)
CNWC	0.019	(0.01)	0.020	(0.011)	–0.002	(–0.001)
BM	0.295	(0)	0.146	(0)	0.149***	-

Panel B: Public Firms: With Bond Market Access versus Without Bond Market Access						
	With Bond Market Access		Without Bond Market Access		Difference	
# of obs	6,168		14,744			
	Mean	(Median)	Mean	(Median)	Mean	(Median)
LEV	0.321	(0.318)	0.174	(0.133)	0.146***	(0.185)
ISSUE	0.452	(0)	0.310	(0)	0.142***	-
RETIRE	0.177	(0)	0.127	(0)	0.050***	-
ASSET	12.09	(11.75)	11.41	(11.32)	0.68***	(0.43)
PROFIT	0.045	(0.053)	0.071	(0.07)	–0.027***	(–0.017)
SG	0.112	(0.053)	0.098	(0.055)	0.014	(–0.002)
TANG	0.283	(0.266)	0.275	(0.256)	0.008***	(0.01)
INDLEV	0.256	(0.262)	0.256	(0.269)	0.000	(–0.007)
EIR	0.033	(0.032)	0.033	(0.032)	0.000	(0)
CF	0.049	(0.053)	0.075	(0.069)	–0.025***	(–0.016)
CPX	0.046	(0.022)	0.051	(0.024)	–0.005***	(–0.002)
CNWC	0.018	(0.009)	0.019	(0.01)	–0.001	(–0.001)
BM	1.000	(1)	0.000	(0)	1.000	-
Panel C: Private Firms: With Bond Market Access versus Without Bond Market Access						
	With Bond Market Access		Without Bond Market Access		Difference	
# of obs	3,056		17,856		-	
	Mean	(Median)	Mean	(Median)	Mean	(Median)
LEV	0.387	(0.395)	0.218	(0.168)	0.170***	(0.227***)
ISSUE	0.447	(0)	0.289	(0)	0.159***	-
RETIRE	0.141	(0)	0.115	(0)	0.026***	-
ASSET	12.32	(12.14)	11.40	(11.3)	0.92***	(0.84***)
PROFIT	0.092	(0.087)	0.106	(0.093)	–0.014***	(–0.006***)
SG	0.147	(0.077)	0.149	(0.074)	–0.002	(0.003)
TANG	0.369	(0.353)	0.297	(0.265)	0.072***	(0.088***)
INDLEV	0.274	(0.275)	0.253	(0.265)	0.021***	(0.01***)
EIR	0.033	(0.032)	0.033	(0.032)	0.000	(0)
CF	0.103	(0.089)	0.115	(0.096)	–0.012***	(–0.007***)
CPX	0.065	(0.033)	0.058	(0.025)	0.007***	(0.008***)
CNWC	0.022	(0.012)	0.020	(0.011)	0.002	(0.001)
BM	1.000	(1)	0.000	(0)	1.000	-

Notes: This table reports summary statistics of the variables for the matched sample. The statistics are based on 20,912 matched public and 20,912 matched private firm-year observations spanning the period 2003-2019. See table A.1 for variable definitions. Panel A compares public and private firms in the matched sample. Panel B (Panel C) compares firms with access to bond markets and those without such access among the matched public (private) subsample. The accompanying significance levels for the difference in mean and median are from two-sample *t*-tests of the equality of means and non-parametric tests of the two-sample equality of medians, respectively. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

A few points are worth noting for the matched sample. First, even after matching, public firms, compared to private counterparts, have lower leverage (public firms 0.218 versus private firms 0.343) and are more likely to issue capital (public firms 0.352 versus private firms 0.142). In addition, relative to private counterparts, public firms are more likely to retire capital (public firms 0.142 versus private firms 0.119); this result is opposed to the case for full sample (public firms 0.142 versus private firms 0.149). Second, firms with access to bond market, regardless of whether they are public or private, have higher leverage ratios and are more likely to issue or retire capital, than those without such access. After matching, private firms with bond market access are more like to retire capital than private firms without such access, which is not the case for the full sample.

4. DETERMINANTS OF TARGET LEVERAGE

4.1. Access to Public Equity Markets and Target Leverage

We examine the effect of a firm's access to public equity markets (i.e., KOSPI and KOSDAQ markets in Korea Exchange or KRX) on its target leverage. The main explanatory variable of interest is *PUB*. Table 3 reports estimation results for the full sample (columns (1) and (2)) and for the matched sample (columns (3) and (4)).

Table 3 Determinants of Leverage: Public versus Private Firms

	Full Sample		Matched Sample	
	OLS (1)	OLS-FE (2)	OLS (3)	OLS-FE (4)
Panel A: Pooled Coefficients				
PUB	−0.0401*** (−26.06)	−0.0433*** (−7.55)	−0.0380*** (−20.52)	−0.0492*** (−4.76)
ASSET	−0.0145*** (−28.74)	0.0405*** (20.24)	−0.0008 (−1.17)	0.0424*** (7.49)
PROFIT	−0.4744*** (−71.53)	−0.2749*** (−33.66)	−0.5605*** (−52.56)	−0.3146*** (−14.87)
SG	0.0448*** (27.86)	0.0076*** (7.34)	0.0477*** (18.42)	0.0115*** (3.96)
TANG	0.2185*** (88.25)	0.1343*** (21.11)	0.2557*** (52.08)	0.1555*** (9.96)
INDLEV	0.4677*** (75.76)	0.0564*** (3.24)	0.2889*** (29.82)	0.1548*** (3.28)
EIR	0.0051 (0.63)	−0.0006 (−0.18)	0.0053 (0.44)	−0.0075 (−0.92)
# of obs	155,377	155,377	41,824	41,824
$\mathcal{R}^2$ adj.	0.1848	0.0643	0.1677	0.7521
Panel B: Separate Coefficients				
PUB	−0.3655*** (−26.07)	−0.2655*** (−7.36)	−0.3207*** (−16.13)	−0.4036*** (−4.58)
# of obs	155,377	155,377	41,824	41,824
$\mathcal{R}^2$ adj.	0.1892	0.0669	0.1756	0.7544
Pred LEV^{Pub}	0.218	0.268	0.210	0.207
Pred LEV^{Prv}	0.295	0.340	0.248	0.251
p-value (Pred LEV^{Pub} = Pred LEV^{Prv})	0.000	0.000	0.000	0.000
Pred LEV^{Pub} < Pred LEV^{Prv}	93.8%	97.0%	86.0%	84.3%

Notes: This table reports the results of determinants-of-target-leverage regressions, which are estimated using both OLS (ignoring the fixed effect) and OLS with firm fixed-effect method. It presents estimation results for full sample (columns (1) and (2)) and matched sample (columns (3) and (4)). The main explanatory variable of interest is *PUB*. See table A.1 for variable definitions. Time dummy variables are included in estimation, but not reported. The *t*-statistics reported in parentheses are computed with standard errors adjusted for both heteroskedasticity and firm-level clustering. In Panel A (Panel B), the regression is estimated using pooled (separate) coefficient approach. In Panel B, coefficients and t-statistics for control variables are not reported to save space. Also reported are mean predicted leverage levels for public and private firms, computed as follows. For each observation of a public (private) firm, both the predicted leverage of that firm and the predicted leverage of that firm if the firm were private (public) are obtained using separate coefficients from the regression. We then compute the means of these predicted values. Reported below are the *p*-value for equality of these two mean values and the percentage of cases that the predicted leverage if the firms were public is smaller than the predicted leverage if the firms were private. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

In Panel A of table 3, where the regressions are estimated using pooled coefficient approach, the coefficients on control variables are generally consistent with those found in previous studies (e.g., Frank and Goyal, 2009; Marchica and Mura, 2010; Zhou et al., 2016). Target leverage decreases with profitability (e.g., Faulkender and Petersen, 2006; Brav, 2009; Frank and Goyal, 2009; Zhou et al., 2016)

and increases with growth opportunities (e.g., Frank and Goyal, 2009), tangibility (e.g., Faulkender and Petersen, 2006; Brav, 2009; Frank and Goyal, 2009; Zhou et al., 2016), and industry median leverage (e.g., Frank and Goyal, 2009; Zhou et al., 2016). The coefficients on expected inflation are not significant in all columns. In contrast, the effect of asset size on target leverage varies depending on specifications; the coefficients are positive when fixed effect is included (columns (2) and (4)), but they are negative when fixed effect is not included (columns (1) and (3)). The signs of coefficients on asset size are also not consistent across previous studies; some studies report positive signs (e.g., Brav, 2009; Zhou et al., 2016) while others report negative signs (e.g., Faulkender and Petersen, 2006). The coefficients on *PUB* are negative and statistically significant in all columns, suggesting that access to public equity markets lowers target leverage.

In Panel B of table 3, where the regression is estimated using separate coefficient approach, the coefficients on control variables are mostly in the same directions with similar statistical significance levels (not reported in order to save spaces) as in Panel A of table 3. The coefficients on *PUB* are negative and significant in all columns, suggesting that access to public equity markets decreases a firm's target leverage. Also reported are mean predicted leverages for public and private firms. The predicted leverages are computed as follows. For each observation of a public (private) firm, both the predicted leverage of that firm and the predicted leverage of that firm if it were private (public) are obtained using separate coefficients estimated from the regressions. We then compute the means of these predicted leverages. In column (1), the mean predicted leverage if firms were public is 21.8%, and it is 29.5% if firms were private. In 93.8% of the observations, the predicted leverage if the firms were public is smaller than the predicted leverage if the firms were private. In other columns, the mean predicted leverage of firms if they were public is also smaller than the mean predicted leverage if they were private.

In sum, the negative coefficients on *PUB* in Panel A of table 3 and the negative coefficients on *PUB* as well as smaller mean predicted leverage of a firm if it were public in Panel B of table 3, strongly indicate that a firm's access to public equity markets lowers its target leverage, which supports **H1**. Our finding that a public firm tends to have lower target leverage than a private firm is in line with previous studies (e.g., Brav, 2009; Goyal et al., 2011). Moreover, the finding that target leverage of a public firm is lower than that of a private firm, even after size and industry matching, lends additional support to the role of a firm's access to public equity markets in lowering the leverage. These findings imply that a firm's access to public equity markets may reduce its absolute cost of equity capital and/or cost of leverage adjustment.

4.2. Access to Bond Market and Target Leverage

In this subsection, the effect of a firm's access to bond market on its target leverage is examined. The main explanatory variable of interest is *BM*. The determinants-of-leverage regressions are estimated separately on public and private firms. Table 4 reports estimation results for the full sample (columns (1) - (4)) and for the matched sample (columns (5) - (8)). In Panel A of table 4, where the regressions are estimated using pooled coefficient approach, the coefficients on control variables are largely in the same directionx with similar statistical significance levels as in Panel A of table 3. The coefficients on *BM* are positive and statistically significant in all columns; coefficients on *BM* are positive and significant for public and private firms alike, and in full sample as well as in matched sample.

In Panel B of table 4, where the regression is estimated using separate coefficient approach, the coefficients on *BM* are positive and significant in columns (1), (3), (4) and (7). Also reported are mean predicted leverage levels for firms with access to bond market and those without such access. In column (1), the mean predicted leverage if public firms had access to bond markets is 31.2%, and it is 17.7% if public firms had no access to bond markets. In 100% of the observations, the predicted leverage if public firms had access to bond markets is larger than the predicted leverage if public firms had no such access. In other columns, for public and private firms alike, and in full sample as well as in matched sample, the mean predicted leverage of firms if they had access to bond markets is also larger than the mean predicted leverage if they had no such access.

Table 4 Determinants of Leverage: Firms with versus without Bond Market Access

	Public Firms (Full Sample)		Private Firms (Full Sample)		Public Firms (Matched Sample)		Private Firms (Matched Sample)	
	OLS (1)	OLS-FE (2)	OLS (3)	OLS-FE (4)	OLS (5)	OLS-FE (6)	OLS (7)	OLS-FE (8)
Panel A: Pooled Coefficients								
BM	0.1327*** (50.80)	0.0500*** (15.71)	0.1609*** (96.80)	0.0352*** (17.14)	0.1340*** (50.71)	0.0215** (2.14)	0.1604*** (47.17)	0.0215** (2.14)
ASSET	-0.0049*** (−5.94)	0.0451*** (10.17)	-0.0283*** (−47.28)	0.0343*** (15.29)	-0.0021** (−2.32)	0.0233* (1.77)	-0.0252*** (−22.97)	0.0233* (1.77)
PROFIT	-0.4156*** (−29.57)	-0.2822*** (−13.46)	-0.4560*** (−62.91)	-0.2588*** (−29.93)	-0.4134*** (−29.06)	-0.3136*** (−7.95)	-0.5377*** (−34.79)	-0.3136*** (−7.95)
SG	0.0224*** (6.90)	0.0069** (2.48)	0.0478*** (26.90)	0.0074*** (6.72)	0.0222*** (6.79)	0.0126** (2.20)	0.0599*** (15.86)	0.0126** (2.20)
TANG	0.2195*** (34.27)	0.1283*** (7.76)	0.2162*** (83.41)	0.1348*** (19.68)	0.2172*** (33.45)	0.1821*** (6.46)	0.2540*** (38.88)	0.1821*** (6.46)
INDLEV	0.2580*** (22.79)	0.1832*** (3.78)	0.4868*** (72.19)	0.0571*** (3.07)	0.2569*** (22.11)	0.0791 (0.94)	0.3339*** (23.40)	0.0791 (0.94)
EIR	−0.0013 (−0.07)	-0.0039 (−0.34)	0.0057 (0.67)	0.0009 (0.25)	−0.0005 (−0.03)	−0.0013 (−0.12)	0.0070 (0.49)	−0.0013 (−0.12)
# of obs	21,416	21,416	133,921	133,921	20,912	20,912	20,912	20,912
$\mathcal{R}^2$ adj.	0.2462	0.1159	0.2125	0.0664	0.2473	0.8367	0.2537	0.8367
Panel B: Separate Coefficients								
BM	0.0853*** (3.38)	−0.0065 (−0.23)	0.2856*** (16.35)	0.0503** (2.28)	0.0192 (0.71)	-0.0604* (−1.84)	0.2740*** (8.00)	−0.1462* (−1.90)
# of obs	21,416	21,416	133,921	133,921	20,912	20,912	20,912	20,912
$\mathcal{R}^2$ adj.	0.2484	0.1086	0.2138	0.0591	0.2504	0.6743	0.2566	0.8373
Pred LEV^{BM}	0.312	0.275	0.454	0.380	0.313	0.253	0.390	0.256
Pred LEV^{NO_BM}	0.177	0.210	0.288	0.336	0.177	0.201	0.219	0.238
p-value (Pred LEV^{BM} = Pred LEV^{NO_BM})	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pred LEV^{BM} > Pred LEV^{NO_BM}	100.0%	100.0%	99.9%	100.0%	100.0%	100.0%	99.9%	78.7%

Notes: This table reports the results of determinants-of-target-leverage regressions, which are estimated using both OLS (ignoring the fixed effect) and OLS with firm fixed-effect method. It presents estimation results for public firms in full sample (columns (1) and (2)), private firms in full sample (columns (3) and (4)), public firms in matched sample (columns (5) and (6)), and private firms in matched sample (columns (7) and (8)). The main explanatory variable of interest is *BM*. See table A.1 for variable definitions. Time dummy variables are included in estimation, but not reported. The *t*-statistics reported in parentheses are computed with standard errors adjusted for both heteroskedasticity and firm-level clustering. In Panel A (Panel B), the regression is estimated using pooled (separate) coefficient approach. In Panel B, coefficients and *t*-statistics for control variables are not reported to save space. Also reported are mean predicted leverage levels for firms with bond market access and firms without, computed as follows. For each observation of a firm with (without) bond market access, both the predicted leverage of that firm and the predicted leverage of that firm if the firm had not (had) bond mrket access are obtained using separate coefficients from the regression. We then compute the means of these predicted values. Reported below are the *p*-value for equality of these two mean values and the percentage of cases that the predicted leverage if the firms had bond

market access is larger than the predicted leverage if the firms had not bond market access. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

In sum, the positive coefficients on *BM* in Panel A of table 4 and the larger mean predicted leverage of firms if they had access to bond market in Panel B of table 4 strongly indicate that access to bond market raises target leverage of firms, which supports **H2**. Our finding that a public firm with access to bond market tends to have higher target leverage than that without such access is in line with previous studies (e.g., Faulkender and Petersen, 2006). Moreover, it is new finding to the literature the that target leverage of a private firm with access to bond market is higher than that of a private firm without such access. These findings lend further support to the role of a firm's access to bond market in raising its target leverage.

5. ADFUSTMENT TO TARGET LEVERAGE

5.1. Access to Public Equity Markets and Adjustment to Target Leverage

We examine the effect of a firm's access to public equity markets (KOSPI and KOSDAQ markets in Korea Exchange or KRX) on the speed of adjustment (SOA) toward a target leverage. The main interest is in the coefficients on *PUB*×*LEV*, which represent the difference in the SOAs between public and private firms. Table 5 presents estimation results for the full sample (columns (1) and (2)) and for the matched sample (columns (3) and (4)). The coefficients on control variables are largely in the same directions with similar statistical significance levels as in Panel A of table 3. In column (1), where the partial adjustment model is estimated with OLS for the full sample, the coefficient on *LEV* is 0.919, which means that private firms close the gap between actual and target leverage about 8% in one year. Further, the coefficient on *PUB*×*LEV* is –0.077 and statistically significant. This implies that the SOA of public firms is faster than that of private firms. In other columns, the coefficients on *LEV* range from 0.534 to 0.896; they vary depending on estimation methods and samples.[8] The coefficients on *PUB*×*LEV* are negative and statistically significant in columns (2), (5) and (6) while the coefficients on *PUB*×*LEV* are close to 0 and statistically insignificant in columns (3) and (4).

Table 5 Speed of Leverage Adjustment: Public Firms versus Private Firms

	Full Sample		Matched Sample	
	OLS (1)	OLS-FE (2)	OLS (3)	OLS-FE (4)
LEV	0.9187*** (641.85)	0.5579*** (110.26)	0.8955*** (173.03)	0.5740*** (82.62)
PUB	0.0189*** (13.57)	0.0054 (1.26)	0.0130*** (7.33)	0.0027 (0.64)
PUB x LEV	–0.0771*** (–13.69)	–0.0200* (–1.82)	–0.0579*** (–8.14)	–0.0309*** (–3.66)
ASSET	–0.0010***	0.0136***	–0.0011**	0.0156***

[8] Similar to findings from previous studies (e.g., Flannery and Rangan, 2006), adding firm fixed-effect to the partial adjustment model makes the implied SOA considerably faster.

	(−3.99)	(9.87)	(−2.31)	(11.15)
PROFIT	−0.0479***	−0.0826***	−0.0547***	−0.0973***
	(−12.86)	(−13.13)	(−6.85)	(−12.02)
SG	0.0035***	0.0033***	0.0069***	0.0046***
	(3.46)	(3.31)	(3.10)	(3.44)
TANG	0.0054***	0.0240***	0.0128***	0.0348***
	(4.79)	(5.86)	(3.85)	(6.90)
INDLEV	0.0353***	0.0099	0.0502***	0.0361**
	(14.43)	(0.97)	(8.17)	(2.09)
EIR	0.0009	−0.0018	0.0012	−0.0061
	(0.23)	(−0.53)	(0.17)	(−0.97)
# of obs	129,443	129,443	41,824	41,824
$\mathcal{R}^2$ adj.	0.8493	0.3343	0.7851	0.8263

Notes: This table reports the results of partial-adjustment-of-leverage regressions, which are estimated using both OLS (ignoring the fixed effect) and OLS with firm fixed-effect method. It presents estimation results for full sample (columns (1) and (2)) and matched sample (columns (3) and (4)). The main explanatory variable of interest is *PUB* x *LEV*. See table A.1 for variable definitions. Time dummy variables are included in estimation, but not reported. The *t*-statistics reported in parentheses are computed with standard errors adjusted for both heteroskedasticity and firm-level clustering. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

In sum, we find strong evidence that, in full sample and in matched sample as well, a firm's access to public equity markets make the firm adjust to its target leverage faster, which supports **H1**. Our finding that a public firm adjusts to its target leverage faster than a private firm is in line with previous studies (e.g., Brav, 2009). Moreover, it is new finding to the literature that the SOA of a public firm is faster, even after matching, than that of a private firm. This finding provides additional support to the role of a firm's access to public equity markets in facilitating adjustment of leverage, i.e., capital structure.

5.2. Access to Bond Market and Adjustment to Target Leverage

In this subsection, the effect of a firm's access to bond market on the SOA to a target leverage is examined. The main interest is in the coefficients on *BM* x *LEV*, which represent the difference in the SOA between the firms with access to bond markets and those without such access. Table 6 reports estimation results separately for public and private firms in full sample (columns (1)-(4)) and in matched sample (columns (5)-(8)). The coefficients on control variables are largely in the same directions with similar statistical significance levels as in Panel A of table 4. In column (1), where the partial adjustment model is estimated with OLS for the public firms in full sample, the coefficient on *LEV* is 0.838, which means that public firms without bond market access close the gap between actual and target leverage about 16% in one year. Further, the coefficient on *BM*×*LEV* is −0.026 and statistically significant. This implies that the SOAs of public firms with bond market access are faster than those of public firms without such access. In other columns, the coefficients on *LEV* range from 0.514 to 0.916; they vary depending on estimation methods and samples. The coefficients on *BM* x *LEV* in columns (2) through (7) range from −0.007 to −0.051; they are negative and statistically significant. In contrast, coefficient on *BM*×*LEV* is close to 0 and not statistically significant in column (8).

Table 6 Speed of Leverage Adjustment: Firms with versus without Bond Market Access

	Public Firms (Full Sample)		Private Firms (Full Sample)		Public Firms (Matched Sample)		Private Firms (Matched Sample)	
	OLS (1)	OLS-FE (2)	OLS (3)	OLS-FE (4)	OLS (5)	OLS-FE (6)	OLS (7)	OLS-FE (8)
LEV	0.8377***	0.5146***	0.9163***	0.5553***	0.8432***	0.5298***	0.8912***	0.5636***
	(118.92)	(41.19)	(597.34)	(105.24)	(121.08)	(69.88)	(145.54)	(81.61)

BM	0.0106*** (4.33)	0.0071*** (2.68)	0.0159*** (12.14)	0.0117*** (7.53)	0.0223*** (5.44)	0.0115*** (3.23)	0.0280*** (3.80)	0.0003 (0.04)
BM x LEV	−0.0262*** (−3.30)	−0.0249*** (−3.00)	−0.0096*** (−3.18)	−0.0071** (−2.18)	−0.0512*** (−3.79)	−0.0182* (−1.74)	−0.0322* (−1.94)	0.0082 (0.60)
ASSET	0.0006 (1.09)	0.0269*** (8.33)	−0.0022*** (−8.27)	0.0088*** (5.74)	−0.0006 (−1.02)	0.0240*** (12.38)	−0.0039*** (−4.80)	−0.0009 (−0.43)
PROFIT	−0.0689*** (−6.29)	−0.1117*** (−6.64)	−0.0461*** (−11.63)	−0.0770*** (−11.28)	−0.0473*** (−4.62)	−0.0945*** (−8.08)	−0.0606*** (−4.86)	−0.1064*** (9.51)
SG	0.0103*** (3.84)	0.0064** (2.34)	0.0025** (2.28)	0.0029*** (2.69)	0.0089*** (3.60)	0.0042** (2.21)	0.0049 (1.38)	0.0057*** (3.14)
TANG	0.0220*** (4.76)	0.0280*** (2.63)	0.0048*** (4.11)	0.0243*** (5.41)	0.0182*** (4.10)	0.0284*** (4.09)	0.0098** (2.12)	0.0403*** (5.35)
INDLEV	0.0442*** (5.91)	0.0783** (2.53)	0.0338*** (13.05)	0.0076 (0.69)	0.0515*** (6.91)	0.0573** (2.35)	0.0517*** (5.28)	−0.0149 (−0.60)
EIR	−0.0196 (−1.40)	−0.0155 (−1.27)	0.0039 (1.02)	0.0006 (0.18)	−0.0149 (−1.13)	−0.0116 (−1.11)	0.0107 (1.36)	0.0019 (0.26)
# of obs	19,066	19,066	110,377	110,377	20,912	20,912	20,912	20,912
$\mathcal{R}^2$ adj.	0.7205	0.3191	0.8607	0.3325	0.7148	0.7543	0.8364	0.8878

Notes: This table reports the results of partial-adjustment-of-leverage regressions, which are estimated using both OLS (ignoring the fixed effect) and OLS with firm fixed-effect method. It presents estimation results for public firms in full sample (Columns 1 and 2), private firms in full sample (columns (3) and (4)), public firms in matched sample (columns (5) and (6)), and private firms in matched sample (columns (7) and (8)). The main explanatory variable of interest is *BM* x *LEV*. See table A.1 for variable definitions. Time dummy variables are included in estimation, but not reported. The *t*-statistics reported in parentheses are computed with standard errors adjusted for both heteroskedasticity and firm-level clustering. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

In sum, we find strong evidence that, for public and private firms alike, and in full sample as well as in matched sample, a firm's access to bond market makes the firm adjust to its target leverage faster, which supports **H2**. Our finding that a public firm with access to bond market adjusts to its target leverage faster than that without such access is in line with previous literature (e.g., Brav, 2009). Moreover, it is new the finding to the literature that the SOA of a private firm with access to bond market is faster than that of a private firm without such access. These findings provide additional support to the role of a firm's access to bond market in facilitating adjustment of leverage, i.e., capital structure.

6. DETERMINANTS OF CAPITAL ISSUANCE OR RETIREMENT

6.1. Access to Public Equity Markets and Capital Issuance or Retirement

The effect of a firm's capital market access on the speed of adjustment (SOA) toward a target leverage was examined in the previous section. Complementary to examining the SOA, investigating capital issuance or retirement of a firm could provide more insight to understanding the firm's decisions regarding capital structure, i.e., financing activities of issuance and/or retirement of capital. The main explanatory variable of interest is *PUB*. Table 7 reports estimation results for the full sample (columns (1) and (2)) and for the matched sample (columns (3) and (4)).

Table 7 Financing Activity: Public Firms versus Private Firms

	Full Sample		Matched Sample	
	Issuance (1)	Retirement (2)	Issuance (3)	Retirement (4)

Panel A: Pooled Coefficients				
PUB	0.4217*** (21.07)	0.2227*** (9.01)	0.1624*** (6.64)	0.2525*** (8.01)
ASSET	−0.0531*** (−8.65)	−0.0856*** (−11.65)	−0.0818*** (−8.75)	−0.0394*** (−3.33)
SG	0.3409*** (19.86)	0.1227*** (6.13)	0.3936*** (12.49)	0.0682 (1.62)
CF	−5.0543*** (−61.49)	0.7750*** (9.10)	−6.3348*** (−42.40)	−0.7125*** (−4.12)
CPX	11.9135*** (118.08)	−1.9664*** (−12.46)	11.0722*** (55.82)	−0.8256*** (−2.60)
CNWC	7.4319*** (104.66)	-4.6860*** (-58.02)	7.0231*** (51.70)	−3.9378*** (−23.14)
# of obs	155,337		41,824	
Pseudo $\mathcal{R}^2$	0.132		0.118	
Panel B: Separate Coefficients				
PUB	1.8743*** (11.78)	0.5814*** (2.95)	1.6759*** (7.53)	2.4790*** (8.77)
# of obs	155,337		41,824	
Pseudo $\mathcal{R}^2$	0.134		0.122	
Pred Pr^{PUB} [Action]	35.3%	15.1%	34.0%	13.9%
Pred Pr^{PRV} [Action]	28.0%	14.6%	31.8%	11.7%
p-value (Pred Pr^{PUB} [Action] = Pred Pr^{PRV} [Action])	0.000	0.000	0.000	0.000
Pred Pr^{PRV} > Pred Pr^{PUB} [Action]	9.0%	26.5%	27.3%	18.9%
Pred Pr^{PUB} [No Action]	49.6%		52.2%	
Pred Pr^{PRV} [No Action]	57.4%		56.4%	
p-value (Pred Pr^{PUB} [No Action] = Pred Pr^{PRV} [No Action])	0.000		0.000	
Pred Pr^{PRV} > Pred Pr^{PUB} [No Action]	85.7%		73.1%	

Notes: This table reports the results of capital-issuance-or-retirement regressions, which are estimated using the multinomial logit model. It presents estimation results for full sample (columns (1) and (2)) and matched sample (columns (3) and (4)). The main explanatory variable of interest is *PUB*. See table A.1 for variable definitions. Time dummy variables are included in estimation, but not reported. The *t*-statistics reported in parentheses are computed with standard errors adjusted for both heteroskedasticity and firm-level clustering. In Panel A (Panel B), the regression is estimated using pooled (separate) coefficient approach. In Panel B, coefficients and *t*-statistics for control variables are not reported to save space. Also reported are mean predicted probabilities of capital issuance, capital retirement, and no action of firms if the firms were public or private, the *p*-value for equality of these two mean values, and the percentage of cases that the predicted probabilities if the firms were public is smaller than the predicted probabilities if the firms were private. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

In Panel A of table 7, where the regression is estimated using pooled coefficient approach, the coefficients on control variables are generally consistent with those found in previous studies (e.g., Frank and Goyal, 2003; Brav, 2009). Asset size (*ASSET*) is inversely associated with capital issuance or retirement, and growth opportunities (*SG*) are strongly positively related with capital issuance (Brav, 2009). Operating cash flows are strongly positively related with capital issuance. Capital expenditures (*CPX*) and working capital investment (*CNWC*) have strongly positive relation with capital issuance, and they have strongly negative relation with capital retirement. The coefficients on *PUB*

are positive and statistically significant in columns (1), (2), (3), and (4), suggesting that a firm's access to public equity markets facilitate both capital issuance and retirement (relative to no action) in full and matched samples.

In Panel B of table 7, where the regression is estimated using separate coefficient approach, the coefficients on control variables are mostly in the same directions with similar statistical significance levels (not reported in order to save spaces) as in Panel A of table 7. The coefficients on *PUB* are positive and statistically significant in columns (1), (2), (3), and (4), suggesting that access to public equity markets facilitate capital issuance and retirement in both full and matched samples.

Also reported are mean predicted probabilities of capital issuance, capital retirement, and no action of firms if the firms were public or private. For the full sample (columns (1) and (2)), the mean predicted probability of issuance, retirement, and no action if firms were public is 35.0%, 15.1%, and 49. 6%, respectively. The mean predicted probability of issuance, retirement, and no action if firms were private is 28.0%, 14.6%, and 57.4%, respectively. The differences in these predicted probabilities between public and private firms are statistically significant. In 85.7% of the observations, the predicted probability of no action is larger if the firm is private than that if it is public. For the matched sample (columns (3) and (4)), the mean predicted probability of issuance or retirement if firms were public is higher than that if firms were private. The mean predicted probability of no action if firms were public is lower than that if firms were private.

In sum, the positive coefficients on *PUB* in Panels A and B of table 7, and the higher mean predicted probability of issuance or retirement if a firm were public than that if the firm were private, in full sample as well as in matched sample, strongly indicate that a firm's access to public equity markets leads the firm to more active issuance or retirement of capital, which supports **H1**.

Our finding that a public firm tends to exercise more active issuance and retirement of capital than a private firm, before and after matching on asset size and industry, corroborates empirical findings in the previous studies (e.g., Brav, 2009).

6.2. Access to Bond Market and Capital Issuance or Retirement

In this subsection, the effect of access to bond market on activeness of capital issuance/retirement is examined. The main explanatory variable of interest is *BM*. Table 8 reports estimation results separately for public and private firms in full sample (columns (1)- (4)) and in matched sample (columns (5)-(8)). In Panel A of table 8, where the regression is estimated using pooled coefficient approach, the coefficients on control variables are largely in the same directions with similar statistical significance levels as in Panel A of table 7. The estimated coefficients on *BM* are positive and statistically significant in all columns.

Table 8 Financing Activity: Firms with versus without Bond Market Access

	Public Firms (Full Sample)		Private Firms (Full Sample)		Public Firms (Matched Sample)		Private Firms (Matched Sample)	
	Issuance (1)	Retirement (2)	Issuance (3)	Retirement (4)	Issuance (5)	Retirement (6)	Issuance (7)	Retirement (8)
Panel A: Pooled Coefficients								
BM	0.9874*** (25.61)	0.8510*** (17.88)	1.0887*** (45.14)	0.3219*** (10.07)	0.9892*** (−25.46)	0.8544*** (−17.79)	0.9514*** (−19.4)	0.5980*** (−9.27)
ASSET	−0.2287*** (−18.00)	−0.1834*** (−11.60)	−0.0775*** (−10.52)	−0.0945*** (−11.05)	−0.2281*** (−16.62)	−0.1955*** (−11.39)	−0.0947*** (−6.63)	0.0122 −0.68

SG	0.2279*** (4.97)	−0.0927 (−1.53)	0.3536*** (18.74)	−0.1497*** (7.04)	0.2280*** −(4.94)	−0.0916 (−1.51)	0.4958*** (−11.04)	0.1767*** (−3.03)
CF	−6.3670*** (−29.46)	−1.6799*** (−6.41)	−4.6649*** (−51.64)	1.1554*** (12.75)	−6.3759*** (−29.26)	−1.7191*** (−6.51)	−5.6087*** (−26.20)	0.7265*** (−3.1)
CPX	10.8762*** (35.30)	−0.6819 (−1.38)	12.0542*** (111.85)	−2.1327*** (−12.79)	10.8182*** (−34.74)	−0.5884 (−1.18)	11.3869*** (−43.03)	−1.1482*** (−2.78)
CNWC	5.9490*** (31.43)	−2.8590*** (−11.82)	7.7567*** (100.06)	−4.8789*** (−56.69)	5.8966*** (−31.06)	−2.8194*** (−11.60)	8.3206*** (−41.12)	−4.8936*** (−20.21)
# of obs	21,416		133,921		20,912		20,912	
Pseudo $\mathcal{R}^2$	0.120		0.146		0.12		0.149	

Panel B: Separate Coefficients

BM	1.6339*** (5.34)	2.2789*** (5.96)	2.0688*** (10.58)	−1.0029*** (−4.06)	1.6218*** (4.96)	2.5042*** (6.09)	1.6169*** (4.08)	−1.2330** (−2.33)
# of obs	21,416		133,921		20,912		20,912	
Pseudo $\mathcal{R}^2$	0.122		0.146		0.122		0.152	
Pred Pr^{BM} [Action]	19.6%	28.2%	59.4%	13.8%	46%	18%	44.3%	15.8%
Pred Pr^{NO_BM} [Action]	12.3%	16.5%	39.2%	16.1%	31%	13%	29.0%	11.4%
p-value (Pred Pr^{BM} [Action] = Pred Pr^{NO_BM} [Action])	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pred Pr^{BM} > Pred Pr^{NO_BM} [Action]	98.7%	99.3%	100.0%	15.2%	98%	98%	95.3%	47.2%
Pred Pr^{BM} [No Action]	52.2%		26.6%		35%		39.9%	
Pred Pr^{NO_BM} [No Action]	71.2%		44.9%		56%		59.6%	
p-value (Pred Pr^{BM} [No Action] = Pred Pr^{NO_BM} [No Action])	0.000		0.000		0.000		0.000	
Pred Pr^{BM} > Pred Pr^{NO_BM} [No Action]	0.4%		0.0%		1%		0.4%	

Notes: This table reports the results of capital-issuance-or-retirement regressions, which are estimated using the multinomial logit model. It presents estimation results for public firms in full sample (columns (1) and (2)), private firms in full sample (columns (3) and (4)), public firms in matched sample (columns (5) and (6)), and private firms in matched sample (columns (7) and (8)). The main explanatory variable of interest is *BM*. See table A.1 for variable definitions. Time dummy variables are included in estimation, but not reported. The *t*-statistics reported in parentheses are computed with standard errors adjusted for both heteroskedasticity and firm-level clustering. In Panel A (Panel B), the regression is estimated using pooled (separate) coefficient approach. In Panel B, coefficients and *t*-statistics for control variables are not reported to save space. Also reported are mean predicted probabilities of capital issuance, capital retirement, and no action of firms if the firms had bond market access or not, the *p*-value for equality of these two mean values, and the percentage of cases that the predicted probabilities if the firms had bond market access is larger than the predicted probabilities if the firms had not bond market access. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

In Panel B of table 8, where the regressions are estimated using separate coefficient approach, the coefficients on control variables are mostly in the same direction with similar statistical significance levels (not reported in order to save spaces) as in Panel A of table 8. The coefficients on *BM* are positive and statistically significant in columns (1), (2), (3), (5), (6), and (7).

Also reported are mean predicted probabilities of capital issuance, capital retirement, and no action if the firms had access to bond market or not. For public firms in full sample (columns (1) and (2)), the mean predicted probability of issuance, retirement, and no action if firms had access to bond markets is 19.6%, 28.2%, and 52.2%, respectively. The mean predicted probability of issuance, retirement, and no action if firms had no access to bond market is 12.3%, 16.5%, and 71.2%, respectively. The differences in these probabilities between firms with access to bond market and those without such access are statistically significant. In only 0.4% of the observations the predicted probability of no

action is larger if the firm had bond market access than that if it had no such access. With the exception of column (4), the mean predicted probability of issuance or retirement if firms had access to bond market is higher than that if firms had no such access. The mean predicted probability of no action if firms had access to bond market is lower than that if firms had no such access.

In Panels A and B of table 8, the mostly positive coefficients on *BM* and the higher mean predicted probability of issuance or retirement if the firms had access to bond market than that if the firms had no such access, in full sample as well as in matched sample, strongly indicate that access to bond market leads a firm to more active issuance or retirement of capital, which supports **H2**.

It is new finding to the literature that a firm with access to bond market, regardless of whether a firm is public or private, exercise more active issuance and retirement of capital than that without such access, both before and after matching on asset size and industry. This finding corroborates the role of a firm's access to bond market in facilitating adjustment of debt capital.

7. CONCLUSION

In capital structure literature, there has been a growing interest in the supply side of capital, which may explain much of the observed heterogeneity of capital structure across firms. This paper contributes to the literature on capital structure by integrating different sources of capital in a single empirical framework and by providing new empirical findings. Using a large data set of both public and private firms in Korea, this paper analyzes how a firm's access to different types of financing sources in capital markets affects its target leverage, the speed of adjusting (SOA) to a target, and activeness of financing. Public equity (listed stock) and market-based debt (bond) are chosen for empirical analysis as two main types of financing sources in capital market.

Consistent with previous studies, our paper provides the findings that a public firm tends to have lower leverage and adjusts to its target leverage faster than a private firm in Korea. Moreover, a firm with access to bond market is shown to have higher leverage and adjusts faster to its target leverage than that without such access, regardless of whether the firm is public or private. Regarding financing activities, our paper provides the findings that a public firm exercises more active issuance and retirement of capital than a private firm and that a firm with access to bond market, regardless of whether a firm is public or private, exercise more active issuance and retirement of capital than that without such access.

The findings of our paper show that different financing sources in capital markets can have different implications on the firm's capital structure, the speed of adjustment (SOA) to a target leverage, and activeness of financing for public and private firms in Korea.

The extension of our paper is to consider the internal capital market as another source of capital particularly for affiliated firms of large business groups (*chaebols*) which are prevalent in Korean economy.

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Appendix

Table A.1 Definitions of Variables

Variable	Description
	Access to Financing Sources in Capital Markets
PUB	Dummy variable indicating access to public equity markets. It is equal to 1 if a firm is listed on the stock market and 0 otherwise.
BM	Dummy variable indicating access to bond market. It is equal to 1 if a firm's balance sheet account named "long-term bonds" has a positive value and/or the firm possesses credit rating(s) granted by credit rating agencies and 0 otherwise.
	Leverage and Financing Activity
LEV	Leverage. It is the ratio of total debt to total assets. Book value of equity is used to compute total assets. Total debt is the sum of short- and long-term debt.
ISSUE	Dummy variable indicating issuance of capital. *ISSUE* is equal to 1 if the change in issued equity capital divided by beginning-period total assets is greater than 5% and 0 otherwise. *ISSUE* is equal to 1 if the change in the sum of short- and long-term debts divided by beginning-period total assets is greater than 5% and 0 otherwise.
RETIRE	Dummy variable indicating retirement of capital. *RETIRE* is equal to 1 if the change in issued equity capital divided by beginning-period total assets is less than –5% and 0 otherwise. *RETIRE* is equal to 1 if the change in the sum of short- and long-term debts divided by beginning-period total assets is less than –5% and 0 otherwise.
	Control Variables
ASSET	Firm's asset size. It is equal to the natural log of total assets
PROFIT	Profitability. It is equal to the ratio of operating income before depreciation (EBITDA) to total assets.
SG	Sales growth rate. It is equal to $Sales_t$ / $Sales_{t-1}$ 1.
TANG	Asset tangibility. It is the ratio of net property, plant, and equipment to total assets.
INDLEV	Industry median leverage. Industry classification is according to KSIC (Korean Standard Industry Classification)
EIR	Expected inflation rate. It is the expected change in consumer price index over the next 12 months, surveyed by the Bank of Korea (BOK).
CF	Operating cash flow. It is the ratio of operating income before depreciation (EBITDA) to lagged total assets.
CPX	Capital expenditure. It is equal to the ratio of capital expenditure to lagged total assets.
CNWC	Change in net working capital from year t-1 to t normalized by lagged total assets. Net working capital is defined as (current assets – cash and equivalents – current liabilities + short-term debt).