Trademarks and the Cost of Equity Capital

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Abstract

Employing a sample of 5,858 U.S. public firms from 1993 to 2017, this study documents robust evidence that firms that hold more trademarks enjoy a lower cost of equity, even after we control for other determinants of the cost of equity and industry-by-year fixed effects. To address endogeneity issues, we employ three federal-level trademark laws affecting the extent of trademark protection—the Federal Trademark Dilution Act, Moseley v. V. Secret Catalogue, Inc., and the Trademark Dilution Revision Act—as quasi-natural experiments. Our analysis reveals that the impact of trademark registrations on the cost of equity is achieved through the *information asymmetry channel*, the *investor recognition channel*, and the *disciplinary channel*. These results suggest that trademarks play an important role in alleviating firms' equity financing costs, thus clarifying the underlying mechanism through which firms benefit from holding trademarks.

JEL Classification: G12, M41, O34

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1. Introduction

Different from copyright (which protects original artistic and literary works) and patents (which protect inventions), trademarks protect brand names and logos used for goods and services. Trademarks not only help consumers identify the source of products or services but also signal the quality of products or services and build brand awareness and associations among consumers (Krasnikov, Mishra, and Orozco, 2009), thus reducing consumers' search costs, especially when information asymmetry is high (Graham, Hancock, Marco, and Myers, 2013). In addition, trademarks allow a company to build its reputation and benefit from customer loyalty, and prevent others from using similar marks that would otherwise confuse customers (Millot, 2009). In the era of the customer-oriented economy, trademarks serve as an increasingly important class of intangible assets and create real value for firms, thus promoting economic efficiency and growth (Landes and Posner, 1987). Prior literature shows that trademark registrations (Faurel, Li, Shanthikumar, and Teoh, 2020; Hsu, Li, Li, Teoh, and Tseng, 2021) and enhanced trademark protection (Heath and Mace, 2020) can improve firm performance by increasing sales and profitability and decreasing cash flow volatility. One underlying mechanism through which trademarks improve performance is likely the *ease-of-financing channel*. Xu (2021) shows that firms actively use trademarks as collateral for debt financing and in turn invest in capital and employment. In addition, Chiu, Hsu, and Wang (2021) show that under enhanced trademark protection, firms with more famous trademarks pay lower interest rates for bank loans. This evidence suggests that trademarks help reduce friction in debt financing; however, their impact on equity financing remains unexplored. Studying the impact of trademarks on equity financing could further clarify the underlying mechanism through which trademarks improve firm performance and help market participants better understand the source of value creation by trademarks.

In this study, we examine the impact of trademark registrations on firms' cost of equity. We conjecture that firms that hold more trademarks enjoy a lower cost of equity capital for the following reasons. First, trademarks not only convey information regarding the quality of products or services but also signal the financial value of branding. Krasnikov, Mishra, and Orozco (2009) find that both brand-identification and brand-association trademarks positively affect firms' cash flows and stock returns. Han, Hsu, and Huh (2019) show that investors interpret trademark registrations as a positive signal regarding future cash flows, which in turn triggers informed trading. Furthermore, trademark registrations convey important information regarding firms' product and marketing strategies, which helps market participants evaluate firms' financial prospects (Gao and Hitt, 2012; Block, De Vries, Schumann, and Sandner, 2014; Heath and Mace, 2020). Specifically, a trademark registrant is required to demonstrate that a trademark is currently used in commerce. To keep the trademark alive, the trademark registrant has to renew the registration at regular intervals with proof of commercial use. Thus, trademarks convey information regarding the ongoing commercialization of products or services. In addition, the legal protection of trademarks provides firms exclusive rights over their registered trademarks and prevents potential imitation and misuse by competitors, thus enabling firms to invest in product quality and development (Landes and Posner, 1987). Prior literature suggests that enhanced information quality can effectively reduce the adverse selection problem in financial markets, thus decreasing the cost of equity (Lambert, Leuz, and Verrecchia, 2007; Kothari, Li, and Short, 2009). Thus, one may expect that trademarks play a role in reducing the cost of equity through reducing the information asymmetry between shareholders and managers. We term this view the *information asymmetry channel*.

Second, Merton's (1987) theoretical model assumes that investors hold undiversified portfolios due to their limited awareness of all securities in the market and thus require a premium for bearing idiosyncratic risk. One important implication is that the expected return of a security decreases with investor recognition of that security. Merton (1987) further shows that an increase in investor recognition leads to a lower cost of capital. Lehavy and Sloan (2008) document empirical evidence that firms' financing and investment activities are positively related to changes in investor recognition. Compared to financial information and textual information, which require investors' analytical skills to interpret, trademarks transmit zero-hurdle knowledge to investors and positively affect investor recognition. Specifically, firms with more trademarks usually receive more attention from market participants. Thus, one may expect that trademarks reduce the cost of equity through the *investor recognition channel*.

Third, the perpetual legal protection offered by trademarks makes them particularly valuable for firms. However, there is great uncertainty associated with the value of trademarks, which is sensitive to the sentiment of market participants. Specifically, as trademarks are an important class of intangible assets, firms face the risk of losing substantial future cash flows if they are involved in incidents that generate negative externalities. In addition, it is costly for firms to establish trademark value and to restore trademark value when facing intangible value loss. Firms are incentivized to establish high-functioning corporate governance to protect them from losing intangible value, and managers are thus less likely to engage in inappropriate behaviors such as corporate misconduct and insider trading. The cost of equity capital is the internal rate of return that the market applies to a firm's future cash flows to determine its current market value, representing the required rate of return given the market's perception of a firm's riskiness. Thus, one may expect that the negative association between trademarks and the cost of equity is achieved through the *disciplinary channel*.

Employing a sample of 5,858 U.S. public firms (i.e., 43,464 firm-year observations) from 1993 to 2017, we document robust evidence that firms that hold more trademarks enjoy a lower cost of equity, even after we control for other determinants of the cost of equity and industry-by-year fixed effects. The results are not only statistically significant but also economically significant. For example, a one-standard-deviation increase in *Log(1+TM)* (i.e., natural logarithm of one plus the number of valid trademarks held by a firm) decreases *ICOC* (i.e., implied cost of equity) by 0.71% relative to its sample mean. The results are robust when we employ alternative trademark variables, including a qualitative proxy (i.e., trademark dummy), two quality-related trademark proxies (i.e., trademark intensity and trademark diversity), a proxy for newly launched trademarks, two proxies for product and marketing trademarks, and two proxies for trademarks filed by the parent firm and subsidiary firm.

To address endogeneity issues, we employ three federal-level trademark laws affecting the extent of trademark protection—the passage of the Federal Trademark Dilution Act (FTDA) in 1996, the decision on Moseley v. V. Secret Catalogue, Inc., in 2003, and the passage of the Trademark Dilution Revision Act (TDRA) in 2006—as quasi-natural experiments. The FTDA intended to enhance the protection of famous trademark owners against dilution. The decision on Moseley v. V. Secret Catalogue, Inc., was considered a rebuke to the FTDA's overly broad definition of trademark dilution, requiring the proof of actual economic damages for a successful claim of trademark dilution. This decision was later superseded by the TDRA, which restored trademark holders' right to protect their famous trademarks. However, in contrast to the FTDA, the TDRA amended the law by reducing the protection scope and was viewed as failing to restore the protection offered under the FTDA (Cendali and Schriefer, 2006; Beebe, 2007).

We expect that enhanced (diminished) trademark protection should strengthen (weaken) the value of trademarks due to changes in legal protection, in turn affecting firms' cost of equity. If trademarks lead to a reduction in the cost of equity, we should observe that the negative impact of trademark registrations on the cost of equity is strengthened after the passage of the FTDA in 1996, weakened after the decision on Moseley v. V. Secret Catalogue, Inc., in 2003, and indiscernible after the passage of the TDRA in 2006. Based on difference-in-differences (DiD) estimations, our results are consistent with the above expectations. Therefore, our identification strategy alleviates endogeneity concerns and suggests a causal impact of trademark registrations on firms' cost of equity.

Next, we explore the possible economic mechanisms through which trademarks reduce firms' cost of equity. First, we show that the negative association between trademarks and the cost of equity is stronger for firms with higher information asymmetry (i.e., lower analyst and a higher bid-ask spread). This evidence suggests that trademarks convey important information regarding the financial value of branding, thus supporting our conjecture that trademarks play a role in reducing the cost of equity through the *information asymmetry channel*. Second, we show that the negative association between trademarks and the cost of equity is more pronounced for firms with lower ex ante investor recognition (i.e., lower level and percentage of firms' institutional ownership and media coverage). These results suggest that firms with more trademarks receive heightened attention from market participants, and thus, the negative association between trademarks and the cost of equity is achieved through the *investor recognition channel*. Third, we find that the effect of trademarks on the cost of equity is more pronounced for firms with weaker corporate governance (i.e., lower board independence and a higher E-index) and that trademarks negatively predict firms' insider trading profits and firms' misconduct activities. These findings are in line with the *disciplinary channel*.

This paper contributes to the literature in several ways. First, our study extends the literature on the cost of equity capital. Recent literature shows that firms' cost of equity is influenced by a broad set of determinants, including legal institutions and securities regulations (Hail and Leuz, 2006), the adoption of International Financial Reporting Standards (Li, 2010), shareholder rights (Chen, Chen, and Wei, 2011), the information environment (Dhaliwal, Li, Tsang, and Yang, 2011; Barth, Konchitchki, and Landsman, 2013; Shroff, Verdi, and Yost, 2017), customer concentration risk (Dhaliwal, Judd, Serfling, and Shaikh, 2016), and customer satisfaction (Truong, Nguyen, and

Huynh, 2021), among many others. A few studies highlight the significance of intangible assets for the cost of equity. For example, Cao, Myers, Myers, and Omer (2015) find that firms with better reputations enjoy a lower cost of equity. Our paper extends this line of research by showing that trademarks, as an important class of intangible assets, reduce firms' financing costs in the equity market.

Second, our paper sheds additional light on the effect of trademarks on firms' financing costs. Xu (2021) documents the prevalence of pledging trademarks as collateral for debt financing, which is spent on fixed assets and human capital investments. In addition, Chiu, Hsu, and Wang (2021) show that firms with more famous trademarks pay lower interest rates for bank loans after the passage of FTDA in 1996, which enhanced the protection of famous trademarks. Our paper shows that trademark registrations and enhanced trademark protection have a significant impact on firms' cost of equity financing, thus complementing the existing literature that focuses on the cost of debt financing.

Third, our paper contributes to the literature that highlights the value of trademarks. Prior literature suggests that trademark registrations (Faurel, Li, Shanthikumar, and Teoh, 2020; Hsu, Li, Li, Teoh, and Tseng, 2021) and enhanced trademark protection (Heath and Mace, 2020) create value for firms, enabling firms to generate more sales and profit and reducing cash flow uncertainty. Hsu, Li, Li, Teoh, and Tseng (2021) suggest that investors undervalue new trademark registrations, especially those filed by harder-to-value firms. Hsu, Li, Liu, Wu (2021) show that firms with greater product market competition are more likely to initiate acquisitions, and these firms experience higher firm performance, discontinue more overlapping trademarks and register more novel trademarks post-merger. Our paper suggests that trademarks play an important role in alleviating firms' equity financing costs, thus further clarifying the underlying mechanism by which trademarks create value. Specifically, the lower equity financing costs resulting from holding trademarks allow firms to implement product and marketing strategies.

The remainder of this paper is organized as follows. Sections 2 discusses the institutional background. Sections 3 and 4 describe the research design and sample construction, respectively. Section 5 presents our empirical results, and Section 6 concludes the paper.

2. Institutional Background

The United States Patent and Trademark Office (USPTO) defines a trademark as "*a word, phrase,* *symbol, design, color, smell, sound, or combination thereof that identifies and distinguishes the goods and services of one party from those of others.*" A trademark can be a symbol; a classic example of a symbol trademark is McDonald's golden arches. A trademark can also be a name; for example, the famous designer Coco Chanel built her fashion empire using her name as a trademark. Song lyrics can also be trademarked; for example, the famous American singer and songwriter Taylor Swift regularly files trademark applications for lyrics and other slogans under her holding company, TAS Rights Management, LLC.

To register a trademark in the USPTO, as of February 15, 2020, a registrant must file a trademark application online through the Trademark Electronic Application System (TEAS). Specifically, the registrant first selects the appropriate content of the trademark, which must be unique and non-generic.[1] Next, the registrant identifies one or more classes of goods or services listed in the Trademark Identification Manual. Approximately 86.5% of applications are registered in a single class (Graham, Hancock, Marco, and Myers, 2013). In addition, the registrant needs to include one or more filing bases in the application. Each filing basis has different requirements that must be met before a trademark proceeds to registration.[2] The principal rule is that the registrant needs to demonstrate that the trademark is currently used to identify a good or service that the registrant offers for sale. The registration fee is $350 per class for a standard registration as of 2021. The USPTO also offers a less expensive option of $250 per class but with more upfront requirements.[3]

The trademark right can last indefinitely if the registrant renews the registration at regular intervals. To keep the trademark alive, the first maintenance document (i.e., Section 8, declaration that the trademark is currently used in commerce) must be filed between the 5th and 6th years after registration, and the second maintenance document (i.e., Section 8 and Section 9, request for

[1] The content of trademark is considered unique if there is no prior registration with the same content in the same class and is considered non-generic if the trademark is more arbitrary and less descriptive.

[2] The registrant can select from the following filing bases: (1) use in commerce, (2) intent to use in commerce, (3) own a foreign registration for the same trademark, and (4) own a foreign application that was previously filed within six months of the U.S. application for the same trademark. For (2), the registrant must demonstrate use in commerce before the registration can be completed. For (4), the registrant must demonstrate ownership of a foreign registration before the registration can be completed. More information is available at *https://www.uspto.gov/trademarks/apply/basis#1*

[3] For example, the registrant needs to provide all required additional statements at the time of initial application. For a standard registration, the registrant could provide additional statements after the initial application. More information is available at *https://www.uspto.gov/trademarks/apply/initial-application-forms*

renewal of registration) must be filed between the 9th and 10th years after registration and then every 10 years thereafter (i.e., Sections 8 and 9). Failure to file these documents leads to the cancellation of the trademark registration. The nontrivial maintenance cost protects the registrant from occupying unused trademarks. Heath and Mace (2020) show that 53% of registered trademarks are allowed to expire after the first 6 years, indicating that approximately half of registered trademarks are not able to generate sufficient value to cover the maintenance cost.

Modern U.S. trademark law is mainly governed by the Lanham Act enacted in 1946, which grants the USPTO administrative authority over trademark registration and prevents other businesses from adopting an identical or similar trademark and causing confusion as to the source of goods or services. For example, if another business used McDonald's trademark to sell fast food, customers would be confused, and this infringement would be prohibited. Unregistered trademarks (signified by the symbol ™) are under the protection of state-level common law within a local region. Trademarks registered with the USPTO (signified by the symbol ®) receive a higher degree of protection from infringement at the federal level.

The concept of trademark dilution began to influence trademark litigation in the post-Lanham-Act period. Specifically, trademark dilution involves an unaccredited use of another entity's famous trademark in the absence of any likelihood of competition (Mermin, 2000; Morrin, Lee, and Allenby, 2006). For example, a famous soft drink trademark used by one company could be diluted if another company used a similar trademark for mobile phones. Trademark dilution law protects famous trademarks from uses that weaken their uniqueness regardless of market competition. At the federal level, the first antidilution legislation attempt was the Trademark Law Revision Act (TLRA), enacted in 1988. However, the related section was removed right before its passage due to freedom of speech concerns (Denicola, 1997).

Eight years later, on January 16, 1996, the FTDA went into effect, providing federal protection against trademark dilution rather than only trademark infringement. The FTDA significantly expands trademark rights such that trademark owners must only convince a judge of the likelihood of trademark dilution rather than prove actual infringement (Kim 2001; Bickley 2011). In this way, the FTDA effectively enhances the intellectual property protection of trademarks (Heald and Brauneis, 2010). However, a major limitation is that the FTDA protects only famous trademarks, while most state statutes protect all trademarks regardless of their popularity.

In the post-FTDA period, there were two major trademark legal developments. In March 2003, the U.S. Supreme Court ruled in Moseley v. V. Secret Catalogue, Inc., The decision supported the position that a successful claim of trademark dilution required proof of actual economic damages, thus nullifying the key provision of the FTDA. It was perceived as a suppression of the FTDA's overly broad definition of trademark dilution (Pulliam, 2003). As shown in Heath and Mace (2020), the number of federal dilution claims decreased significantly after 2003. As a response, the TDRA of 2006 was passed by the U.S. House of Representatives and then the Senate. It overturned the decision of Moseley v. V. Secret Catalogue, Inc., and restored trademark holders' right to protect their famous trademarks on the basis of likely dilution without proof of actual economic damages. However, the TDRA amended the law by reducing the protection scope relative to the FTDA was viewed as failing to restore the protection offered under the FTDA (Cendali and Schriefer, 2006; Beebe, 2007).

3. Research Design

3.1. Estimating the Implied Cost of Equity Capital

Following the previous literature, we employ accounting-based valuation models to estimate the ex ante rate of return implied in current stock prices and analysts' earnings forecasts (Chen, Chen, and Wei, 2011; Dhaliwal, Judd, Serfling, and Shaikh, 2016). Specifically, we adopt four implied cost of equity models introduced by Claus and Thomas (2001), Gebhardt, Lee, and Swaminathan (2001), Easton (2004), and Ohlson and Juettner-Nauroth, (2005) (as implemented by Gode and Mohanram (2003)). The first two models are based on the residual income valuation model developed by Ohlson (1995), while the latter two models are based on Ohlson and Juettner-Nauroth's (2005) abnormal earnings growth valuation model. These four models allow us to substitute stock prices and analysts' earnings forecasts into a valuation equation and back out the corresponding internal rate of returns. These rates are ex ante estimates of the cost of equity capital conditional on expected earnings growth. We provide a detailed description of these cost of equity estimates in Appendix A.

As prior literature provides little consensus on which models perform best or how to evaluate them (Botosan and Plumlee, 2005; Gode and Mohanram, 2003; Guay, Kothari, and Shu, 2011), we follow prior literature and use the mean of the estimates from these four models as our primary dependent variable. Using the mean could mitigate the effect of idiosyncratic measurement errors that are associated with one particular model (Hail and Leuz, 2006; 2009).[4]

3.2. Empirical Model

We examine the impact of trademark registrations on firms' cost of equity by estimating the following ordinary least squares (OLS) regression (Chen, Chen, and Wei, 2011):

$$ICOC_{i,t} = \alpha + \beta Log(1 + TM)_{i,t-1} + \lambda_1 Log(Equity)_{i,t-1} + \lambda_2 BM_{i,t-1} + \lambda_3 Leverage_{i,t-1} + \lambda_4 ROA_{i,t-1} + \lambda_5 Momentum_{i,t} + \lambda_6 Beta_{i,t} + \lambda_7 Idiosyncratic\ Risk_{i,t} + \lambda_8 Dispersion_{i,t} + \lambda_9 LTG_{i,t} + \gamma_{j,t} + \varepsilon_{i,t}, \quad (1)$$

where i, j, and t denote firm, industry, and year, respectively. The dependent variable, $ICOC_{i,t}$, is the mean of the abovementioned four implied cost of equity estimates for firm i in year t.[5] The key explanatory variable of interest, $Log(1+TM)_{i,t-1}$, is the natural logarithm of one plus the number of valid trademarks held by firm i in year $t-1$. If firms with more trademarks enjoy a lower cost of equity, we should observe a negative and significant β when estimating Equation (1).

We follow the existing literature and control for a number of known determinants of the cost of equity (Chen, Chen, and Wei, 2011; Dhaliwal, Judd, Serfling, and Shaikh, 2016). Specifically, *Log(Equity)* is the natural logarithm of firms' market capitalization (in millions), adjusted for inflation using 2018 dollars. *BM* is book value of equity scaled by market value of equity. *Leverage* is book value of long-term debt plus book value of debt in current liabilities scaled by total assets. *ROA* is income before extraordinary items scaled by total assets. *Momentum* is the stock return over the fiscal year. *Beta* is estimated by regressing daily stock returns over the fiscal year on the contemporaneous Center for Research in Security Prices (CRSP) value-weighted market returns, correcting for nonsynchronous trading (Scholes and Williams, 1977). *Idiosyncratic Risk* is the annualized standard deviation of the residuals from regressing daily stock returns over the fiscal year on the contemporaneous CRSP value-weighted market returns, correcting for

[4] In the robustness tests, we examine our model using alternative definitions of the cost of equity. First, we employ the median of four implied cost of equity estimates as an alternative dependent variable (Hail and Leuz, 2006; Chen, Chen, and Wei, 2011). Second, we examine each individual implied cost of equity estimate. Third, we define our dependent variable as *ICOC* minus the yield on 10-year treasury bonds (Chen, Chen, and Wei, 2011; Dhaliwal, Judd, Serfling, and Shaikh, 2016). The results are very similar to those we obtain when using our primary dependent variable.

[5] Our empirical results are robust if we use the realized buy-and-hold market-adjusted return instead of implied cost of equity as the dependent variable.

nonsynchronous trading (Scholes and Williams, 1977). *Dispersion* is the standard deviation of analysts' estimates scaled by the consensus forecast for the next period's earnings. *LTG* is the median analyst forecast of the long-term earnings growth rate. Variable definitions are provided in Appendix B. In addition, we include industry-by-year fixed effects (i.e., denoted as $\gamma_{j,t}$ in Equation (1)) to control for unobserved, time-varying industry factors that could be correlated with corporate trademarking activities (Dhaliwal, Judd, Serfling, and Shaikh, 2016). Robust standard errors are clustered at the industry-by-year level.

4. Data and Sample

4.1. Data

The trademark data are sourced from the 2018 version of the USPTO Trademark Case Files dataset, which contains detailed information on 9.1 million trademark applications and registrations between January 1870 and February 2018.[6] It maintains information on trademark content, ownership, classification, filing, registration, renewal or cancellation, etc. To ensure that all trademarks are actually used by trademark assignees, we focus on trademark applications that are finally registered at the USPTO.

One of the main challenges of our study is to link the trademark data to U.S. public firms. We implement matching procedures similar to those of Heath and Mace (2020) and Hsu, Li, Liu, Wu (2021). First, we generate a list of firm names from the CRSP/Compustat merged database. Like patents, trademarks can be registered under the names of a firm's subsidiaries or branches. We thus supplement information on subsidiaries/branches within a corporate family from the LexisNexis Corporate Affiliation database.[7] Next, using the names of both the parent firm and its subsidiaries, we search through the trademark assignee names in the trademark dataset and look for a possible match by employing a fuzzy matching algorithm. Finally, we manually verify each match using firms' location information after locating the closest matching name.

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[6] The USPTO Trademark Case Files Dataset can be accessed at *https://www.uspto.gov/learning-and-resources/electronic-data-products/trademark-case-files-dataset-0*

[7] Our matching approach is slightly different from that of Heath and Mace (2020), which utilize information on subsidiaries from Capital IQ. Different from Capital IQ, which maintains only current information on subsidiaries, LexisNexis contains historical subsidiary data starting in 1993. Our method thus accounts for changes in firms' organizational structure and should provide a more precise match between trademark data and U.S. public firms.

We collect data to estimate the implied cost of equity from the Institutional Brokers' Estimate System (IBES), financial statement data from Compustat, and stock return data from the CRSP. To construct our sample, we intersect these databases with trademark data and keep only observations with sufficient data related to the main variables of interest. Following prior literature, we exclude financial (i.e., SIC codes 6000-6999) and utility (i.e., SIC codes 4900-4999) firms (Dhaliwal, Judd, Serfling, and Shaikh, 2016). To mitigate the influence of outliers, we winsorize all continuous variables at the 1^{st} and 99^{th} percentiles. This selection process results in a final sample of 5,858 firms (i.e., 43,464 firm-year observations) from 1993 to 2017.[8]

4.2. Descriptive Statistics

Panel A of Table 1 presents the descriptive statistics of the variables used in our baseline regression. Specifically, the mean of *ICOC* is 12.064 in our sample. The mean of *Log(1+TM)* is 1.494, indicating that an average firm holds 3.45 trademarks (i.e., *log(1+3.45) = 1.494*). Turning to other firm characteristics, the average market capitalization of the sample firms is 1,166 million (i.e., *log (1,166) = 7.061*). In addition, an average firm borrows 21.8% over assets, earns a 5.3% return on assets, and has a book-to-market ratio of 0.480, an annual stock return of 12.5%, a stock return beta of 1.101, an idiosyncratic risk of 0.410, and an analyst forecast dispersion (a long-term earnings growth rate) of 4.1% (16.7%). These statistics resemble those in prior literature (Chen, Chen, and Wei, 2011; Dhaliwal, Judd, Serfling, and Shaikh, 2016; Heath and Mace, 2020).

[Insert Table 1]

Next, we compare the means of *ICOC* between trademark (i.e., firms with at least one valid trademark) firms and non-trademark firms (i.e., firms without a valid trademark). As shown in Panel B, an average trademark firm has an *ICOC* of 11.434, which is lower than that of an average non-trademark firm (i.e., 12.658). The result is also statistically significant; the *t-value* of the difference in the mean is *-26.835*, indicating that on average, the *ICOC* of trademark firms is lower than that of non-trademark firms.

Panel C presents pairwise correlations of the key variables of interest. It shows that *Log(1+TM)* is negatively correlated with *ICOC*. These results provide preliminary evidence

[8] To link trademark data to U.S. public firms in Compustat, we use the LexisNexis Corporate Affiliation database, which includes data between 1993 and 2017. Thus, our sample period is restricted within this time frame.

regarding the negative association between trademark registrations and the cost of equity. To further validate our conjecture, we perform multivariate analysis to control for other firm characteristics in the following sections.

5. Empirical Analysis

5.1. Trademarks and Cost of Equity Capital

Table 2 reports the OLS regression results from estimating the impact of trademark registrations on the cost of equity. In Column 1, we regress our trademark proxy on firms' cost of equity without controls or fixed effects. In Column 2, we include the industry-by-year fixed effect. In Column 3, we further add all firm-level control variables except two analyst forecast variables (i.e., *Dispersion* and *LTG*) that have lower data coverage. In Column 4, we include the full set of control variables. The key variable of interest is *Log(1+TM)*. As shown in Table 2, the coefficients of *Log(1+TM)* are negative and statistically significant at the 1% level in all four columns, indicating that trademark registrations significantly reduce firms' cost of equity. As shown in Column 4, although the number of observations drops by approximately a quarter, the negative and significant impact of trademark registrations on the cost of equity remains. The impact is not only statistically significant but also economically significant. For example, Column 4 shows that the coefficient (*t-statistic*) of *Log(1+TM)* is -0.046 (*-4.699*), indicating that a one-standard-deviation increase in *Log(1+TM)* decreases *ICOC* by 0.71% relative to its sample mean.[9]

The coefficients of the control variables are largely consistent with those in prior literature (Chen, Chen, and Wei, 2011; Dhaliwal, Judd, Serfling, and Shaikh, 2016). For example, firms with a larger size and a higher stock momentum (i.e., higher *Log(Equity)* and *Momentum*) and lower values for book-to-market ratio, financial leverage, stock return beta, idiosyncratic risk, analyst forecast dispersion, and long-term growth rate (i.e., lower *BM*, *Leverage*, *Beta*, *Idiosyncratic Risk*, *Dispersion*, and *LTG*) have a higher cost of equity. Overall, the baseline results confirm our prediction that firms with more trademark registrations enjoy a lower cost of equity.

[Insert Table 2]

[9] We calculate 0.71% as 0.046×1.859/12.064, where 1.859 and 12.064 are the standard deviation of *Log(1+TM)* and the mean of *ICOC*, respectively.

5.2. Identifications: Exogenous Shocks to Trademark Protection

The baseline results reveal a negative association between trademark registrations and the cost of equity. Since our trademark measures are lagged by one year in the baseline model, it is unlikely that our findings are entirely driven by reverse causality. That is, firms' cost of equity in the current year is unlikely to affect their trademarking activities in the previous year. However, we recognize that the association could be attributed to other unobserved factors, causing concern regarding omitted variables. For example, high-quality firms may hold more trademarks and simultaneously enjoy a lower cost of equity. To mitigate these potential endogeneity issues, we introduce three federal-level trademark laws affecting the extent of trademark protection—the passage of the FTDA in 1996, the decision on Moseley v. V. Secret Catalogue, Inc., in 2003, and the passage of the TDRA in 2006—as quasi-natural experiments.

Under the Lanham Act, trademarks are protected only within the scope of their registered classes, which are specified when the trademarks are filed. To address the prevalent and serious infringement issues incurred by trademark dilution, the FTDA was enacted in 1996 with the intention to enhance the protection of famous trademark owners against dilution. In 2003, the decision on Moseley v. V. Secret Catalogue, Inc., supported the position that a successful claim of trademark dilution required proof of actual economic damages and was seen as a rebuke to the FTDA's overly broad definition of trademark dilution (Pulliam, 2003). This decision was later superseded by the TDRA of 2006, which restored trademark holders' right to protect their famous trademarks on the basis of likely dilution without proof of actual economic damages. However, the TDRA amended the law by reducing the protection scope relative to FTDA and was viewed as failing to restore protection under the FTDA (Cendali and Schriefer, 2006; Beebe, 2007).

To verify the causal link between firms' trademarking activities and the cost of equity, we follow prior studies (Heath and Mace, 2020) and employ the above three plausible exogenous events in the context of our research setting. We hypothesize that enhanced (diminished) trademark protection can strengthen (weaken) the effect of trademarks on the cost of equity. If trademarks indeed reduce firms' cost of equity, we should observe that the negative effect is strengthened after the enhancement of trademark protection (i.e., the passage of the FTDA in 1996), weakened after the diminishment of trademark protection (i.e., the decision on Moseley v. V. Secret Catalogue, Inc., in 2003), and indiscernible after an insignificant change in the trademark protection status quo (i.e., the passage of the TDRA in 2006).

A key limitation of trademark protection laws is that only famous trademarks are affected by extended or shrunken protections against likely dilution. However, such laws do not define what constitutes famous. In practice, whether a trademark is famous is judged on a case-by-case basis, which is a hotly debated issue (Becker, 2000; Dollinger, 2001). In this paper, we follow Heath and Mace (2020) and define famous trademarks as trademarks that had been registered for more than 20 years and were still active in event years.

One key prerequisite for the validation of our DiD research design is the satisfaction of the parallel trend assumption. Stated differently, no obvious trend should exist in the differences in *ICOC* between the treatment (i.e., firms with a famous trademark) and control groups (i.e., firms without a famous trademark) prior to the enactment of trademark laws. To prove this, we plot the time-series values of *ICOC* around the times of the above three events for both the treatment and control groups. In Figure 1, we display the residual *ICOC* of panel regressions with industry-by-year fixed effects.[10] This method generates comparisons in *ICOC* after we remove constant time-varying industry-specific shocks. Not surprisingly, there are no significant differences between the two groups in any pre-FTDA or post-TDRA years. The convergence (divergence) appears only after the passage of the FTDA (the decision on Moseley v. V. Secret Catalogue, Inc.), supporting the parallel trend assumption.

[Insert Figure 1]

To test this conjecture, we follow Heath and Mace (2020) and examine the following DiD estimation for the three years before and after the events (i.e., 1993-1998 for FTDA, 2000-2005 for Moseley v. V. Secret Catalogue, Inc., and 2003-2008 for TDRA):[11]

$$ICOC_{i,t} = \alpha + \beta_1 Log(1 + Famous)_{i,t-1} + \beta_2 Log(1 + Famous)_{i,t-1} \times Post + \\ +\lambda_1 Log(Equity)_{i,t-1} + \lambda_2 BM_{i,t-1} + \lambda_3 Leverage_{i,t-1} + \lambda_4 ROA_{i,t-1} + \lambda_5 Momentum_{i,t} + \\ \lambda_6 Beta_{i,t} + \lambda_7 Idiosyncratic\ Risk_{i,t} + \lambda_8 Dispersion_{i,t} + \lambda_9 LTG_{i,t} + \gamma_{j,t} + \varepsilon_{i,t}. \quad (2)$$

[10] We estimate the regression $ICOC_{i,t} = \alpha + \gamma_{j,t} + \varepsilon_{i,t}$ and extract the residual terms as the residual *ICOC*.

[11] Since the standalone variable *Post Event* is absorbed by the industry-by-year fixed effect in our regression, it does not appear in our model.

We use *Log(1+Famous)* to proxy for famous trademarks; it is computed as the natural logarithm of one plus the number of famous trademarks held by a firm at the end of the fiscal year prior to the event. *Post* indicates the years after the event (i.e., 1996 onwards for FTDA, 2003 onwards for Moseley v. V. Secret Catalogue, Inc., and 2006 onwards for TDRA). Our variable of interest is the interaction term $Log(1 + Famous)_{i,t-1} \times Post$, for which we expect the estimated coefficient β_2 to be negatively significant for the FTDA, positively significant for Moseley v. V. Secret Catalogue, Inc., and insignificant for the TDRA.

The results for the FTDA, Moseley v. V. Secret Catalogue, Inc., and the TDRA are presented in Columns 1-2, 3-4, and 5-6 of Table 3, respectively. Since we constrain our sample period to three years before and after these exogenous events, our sample size is significantly reduced. In Columns 1, 3, and 5, we add all firm-level control variables except two analyst forecast variables. In Columns 2, 4, and 6, we include the full set of control variables. Consistent with our conjecture, the coefficients of *Log(1+Famous)×Post* in Columns 1 and 2 are both negative and significant. These results indicate that the enhanced trademark protection originating from the FTDA leads to a greater negative effect of trademark registrations on the cost of equity, implying a causal interpretation of our findings. Turning to Columns 3 and 4, we find that the coefficients of *Log(1+Famous)×Post* are positive and significant, indicating that the diminished trademark protection by the Moseley v. V. Secret Catalogue, Inc., ruling attenuates the negative impact of trademark registrations on the cost of equity. In Columns 5 and 6, we examine the impact of the TDRA on the cost of equity. As shown in these two columns, there is no significant impact of the TDRA on a firm's cost of equity, indicating that the TDRA failed to restore the pre-Moseley status quo. Overall, our identification strategy alleviates the concern that our baseline findings are due to differentiating trends between the treated and control groups and establishes a causal impact of trademark registrations on firms' cost of equity.

[Insert Table 3]

5.3. The Mechanisms through which Trademarks Affect the Cost of Equity

Thus far, we have shown that firms' trademarking activities have a negative and causal impact on their cost of equity. In this section, we further investigate the potential economic mechanisms through which trademarks affect firms' cost of equity. Specifically, we examine whether the impact of trademark registrations on the cost of equity occurs through the *information asymmetry* *channel*, the *investor recognition channel*, and the *disciplinary channel*. We acknowledge that these underlying economic mechanisms may jointly contribute to the negative impact of trademarks on firms' cost of equity.

5.3.1. The Information Asymmetry Channel

As we discussed earlier, trademarks not only convey information regarding the quality of products or services but also signal the financial value of branding; thus, they can reduce the information asymmetry between shareholders and managers. Additional information can help shareholders evaluate firm value, especially when they face information constraints. If trademarks play an important informational role in affecting the cost of equity, we should observe that the negative association between trademark registrations and the cost of equity is more pronounced for firms with greater information asymmetry.

To test this conjecture, we borrow two information proxies from the existing literature. First, we measure firms' information environment using their analyst coverage (denoted as *Log(1+Analyst)*), which are computed as the natural logarithm of one plus the number of analysts covering the firm).[12] Chang, Dasgupta, and Hilary (2006) argue that financial analysts reduce information asymmetry either directly or by extending coverage to more transparent firms. Second, we use the average quoted bid-ask percentage spread (denoted as *Bid-Ask Spread*) (Hilary, 2006), which is computed as the average bid-ask spread divided by the midpoint of the spread over the year, as a proxy for information asymmetry (Hilary, 2006; Affleck-Graves, Callahan, and Chipalkatti, 2002). Thus, lower values of *Log(1+Analyst)* or higher values of *Bid-Ask Spread* indicate more severe information asymmetry.

The results are presented in Table 4. The variable of interest is the interaction terms between information proxies and trademark variables. The results show that the interaction term *Log(1+TM)×Log(1+Analyst)* is positively significant while *Log(1+TM)×Bid-Ask Spread* is negatively significant at the 1% level. For example, Column 1 shows that the coefficient (*t-statistic*) of *Log(1+TM)×Log(1+Analyst)* is 0.105 (*7.204*), indicating that the negative impact of *Log(1+TM)* on *ICOC* is attenuated for firms with a more transparent information environment (i.e., pronounced for firms with greater information asymmetry). The results are similar in Columns 2 when we use

[12] We collect analyst following data from IBES.

alternative information variable. These results suggest that trademarks are more effective in reducing the cost of equity when information asymmetry is severe, which is in line with our conjecture. Thus, trademarks play a role in reducing the cost of equity through the *information asymmetry channel*.

[Insert Table 4]

5.3.2. The Investor Recognition Channel

One way that trademarks can reduce firms' cost of equity is by increasing investor recognition. Due to their limited awareness of all securities in the market, investors may hold undiversified portfolios based on their knowledge (Merton, 1987). One implication is that higher investor recognition is related to lower expected returns, as higher awareness allows investors to effectively reduce risk by diversifying their portfolios. Numerous empirical studies document evidence to support this implication (Barber and Odean, 2008; Lehavy and Sloan, 2008). If trademarks help attract more investor attention, one may expect that the marginal effect of trademarks in reducing the implied cost of equity should be stronger for firms with lower ex ante investor recognition.

To empirically test this conjecture, we employ three proxies for investor recognition. The first two proxies focus on firms' attractiveness to institutional investors: the level and percentage of institutional ownership (denoted as *Log(1+Inst)* and *%InstOwn*). The third proxies focus on firms' recognition by retail investors: the level of media coverage (denoted as *Log(1+Media)*).[13] Higher value of these proxies indicate higher degree of investor recognition.

As shown in Table 5, the coefficients of the interaction terms between our investor recognition proxies (*Log(1+Inst)*, *%InstOwn*, and *Log(1+Media)*) and *Log(1+TM)* are all positively significant. For example, Column 1 shows that the coefficient (*t-statistic*) of *Log(1+TM) ×Log(1+Inst)* is 0.118 (*9.008*), indicating that the negative impact of *Log(1+TM)* on *ICOC* is attenuated for firms with lower investor recognition (or strengthened for firms with higher investor recognition). The results are similar in Columns 2 and Columns 3 when we use alternative investor recognition proxies. These results suggest that trademarks significantly enhance investor

[13] Institutional ownership data are collected from the Thomson Reuters Institutional Holdings 13F dataset. Media coverage data are obtained from the RavenPack News Analytics database, which collects news and press from major real-time newswires worldwide. We follow the existing literature and keep news with relevance scores of 100 to ensure the firm is the focal entity in the news.

recognition and then reduce a firm's cost of equity. Thus, the negative association between trademarks and the cost of equity is achieved through the *investor recognition channel*.

[Insert Table 5]

5.3.3. The Disciplinary Channel

Next, we examine the *disciplinary channel* through which trademarks affect the cost of equity. Firms with more trademarks tend to face a higher risk of losing substantial future cash flows if they are involved in incidents that generate negative externalities. Meanwhile, it is costly for firms to establish or restore trademark value when facing intangible value loss. Thus, trademarks may act as a disciplinary tool to help mitigate corporate misconduct behaviors. Therefore, one may expect that the effect of trademarks on the cost of equity is stronger for firms with weaker ex ante corporate governance and that trademarks can also reduce firms' misconduct activities. To empirically test this conjecture, we employ two corporate governance proxies: the percentage of independent directors on the board (denoted as *%Board Independence*) and Entrenchment index by Bebchuk, Cohen, Ferrell (2009) (denoted as the *E-index*).[14] A higher (lower) value of *%Board Independence* (*E-index*) is associated with better corporate governance. In addition, we employ two proxies measuring corporate misconduct: insider trading profits (denoted as *Alpha*) and the number of corporate misconduct activities (denoted *Log(1+Misconducts)*). Following Jagolinzer, Larcker, and Taylor (2011) and Dai, Parwada and Zhang (2015), insider trading profit is defined as the annualized abnormal return from the Carhart (1997) four-factor model estimated over the 180 calendar days after the transaction date. To measure corporate misconduct, we calculate the natural logarithm of one plus the number of accounting restatements (which are less severe corporate misconducts compared to financial report manipulations) in the following three years.[15]

We report the results in Table 6. Panel A shows the cross-sectional results. The coefficients of *Log(1+TM)×%Board Independence* are positive and significant, and the coefficients of *Log(1+TM)×E-index* are negative and significant. These results are consistent with our conjecture

[14] Board independence data are collected from BoardEx. Data on the E-index are directly downloaded from Lucian Bebchuk's website. The E-index is constructed by counting the number of the following six provisions associated with a firm: staggered board, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments. We thank Lucian Bebchuk for kindly making the E-index data public on his website, http://www.law.harvard.edu/faculty/bebchuk/studies.shtml.

[15] We collect data for insider from the Thomson Reuters Insider Filing Data Feed and financial misconduct data from the Audit Analytics Non-Reliance Restatement database.

that the disciplinary role of trademarks is more pronounced for firms with weaker ex ante corporate governance. In Panel B, we directly test the impact of trademarks on corporate misconduct. The panel shows that the coefficients of *Log(1+TM)* are negative and significant in both columns, indicating that trademarks significantly reduce firms' misconduct activities (i.e., reducing insider trading profits and the number of accounting restatements). Overall, these results suggest that trademarks act as a disciplinary tool and significantly reduce a firm's cost of equity. Thus, a negative association between trademarks and the cost of equity is achieved through the *disciplinary channel*.

[Insert Table 6]

5.4. Outcomes: Firm Performance and Investments

In the above sections, we document that trademark registrations significantly decrease the cost of equity through the *information asymmetry channel*, the *investor recognition channel*, and the *disciplinary channel*. In this section, we further investigate the consequences of trademarks and the cost of equity. We expect that trademarks reduce firms' cost of equity and then help trademark owners improve firm performance and increase firm investments.

Firms enjoying a lower cost of equity in the capital market tend to be more profitable and face less risk. Thus, two benefits of trademark registrations are increased firm performance and reduced firm risk. We employ four proxies to measure firms' performance and risk: return on assets (*ROA*), gross margin (*Gross Margin*), demand uncertainty (*Demand Uncertainty*), and return volatility (*RetVol*). *ROA* is income before extraordinary items scaled by total assets. *Gross Margin* is sales minus the cost of goods sales scaled by sales. *Demand Uncertainty* is the standard deviation of sales growth in the five-year period surrounding the current year (Cohen and Li, 2020). *RetVol* is the standard deviation of monthly stock returns in a year.

The results are shown in Columns 1-4 of Table 7. The dependent variables are *ROA* in Column 1, *Gross Margin* in Column 2, *Demand Uncertainty* in Column 3, and *RetVol* in Column 4. We find that the coefficients of our trademark proxies are all positive and significant in Columns 1 and 2 and negative and significant in Columns 3 and 4, suggesting that trademark registrations increase firm performance while reducing firm risk. These findings are consistent with those of Heath and Mace (2020) and Krasnikov, Mishra, and Orozco (2009).

[Insert Table 7]

Next, we examine the consequences of trademarks for corporate investment. Firms with a lower cost of equity tend to increase their corporate investments, and firms with more investments tend to have more growth opportunities and better firm performance. Thus, trademark registrations may reduce firms' cost of equity and in turn increase their investments. We construct three corporate investment proxies, SG&A expenses (*SG&A*), R&D expenses (*R&D*), and the number of employees (*Log(Emp)*), representing firms' investments in marketing, innovation, and human capital, respectively. *SG&A* is selling, general and administrative expenses scaled by sales. *R&D* is research and development expenses scaled by sales. *Log(Emp)* is the natural logarithm of the number of employees.

The results are shown in Columns 5-7 of Table 7. The dependent variables are *SG&A* in Column 5, *R&D* in Column 6, and *Log(Emp)* in Column 7. The results show that the coefficients of the trademark proxy are all positive and significant at the 1% level across all columns, implying that trademark registrations significantly increase corporate investments.

5.5. Robustness Tests

5.5.1. Alternative Trademark Measures

In this section, we employ alternative trademark proxies to further address potential measurement concerns regarding our primary trademark variables used in the baseline regression. Specifically, we re-examine the effect of trademark registrations on the cost of equity by using eight alternative trademark measures. First, we use a qualitative indicator that equals one if a firm holds at least one valid trademark in a year and zero otherwise (*TM_D*). Second, we construct two quality-related trademark proxies: trademark intensity and trademark diversity (*TM_Intensity* and *Log(1+Classes)*). *TM_Intensity* is the number of valid trademarks held by a firm scaled by total assets. *Log(1+Classes)* is the natural logarithm of one plus the number of unique trademark classes of trademarks held by a firm. Third, we use only newly launched trademarks to compute our trademark measures. Specifically, *Log(1+NewTM)* is the natural logarithm of one plus the number of newly launched trademarks filed by a firm. Fourth, we follow Hsu, Li, Liu, and Wu (2021) and separate trademarks into product and marketing trademarks to check whether our findings are sensitive to the type of trademark.[16] Specifically, we define *Log(1+ProductTM)* or *Log(1+MarketingTM)* as the natural logarithm of one plus the number of valid product or marketing trademarks held by a firm. Finally, we follow Yang and Yuan (2021) and separate trademarks into parent and subsidiary trademarks. Specifically, we define *Log(1+ParentTM)* or *Log(1+SubsidiaryTM)* as the natural logarithm of one plus the number of valid trademarks registered by the parent (or subsidiary) firm.

The results are presented in Table 8. Throughout all of the first five columns, the coefficients of the nuanced measures on trademarks are all negative and significant at the 1% level, indicating that not only the number but also the quality and freshness of trademarks matter in reducing firms' cost of equity. In addition, the results in Columns 5 and 6 show that only product (and not marketing) trademarks can significantly reduce firms' equity financing costs, indicating that investors value product-related trademarks more than marketing trademarks. Moreover, the results in Columns 7 and 8 show that only parent trademarks have a significantly negative impact on the cost of equity. Trademarks registered by subsidiary firms may not be easily discovered by investors and thus may not have a significant impact on the cost of equity. This evidence further supports the informational role of trademarks. Overall, we find robust and consistent results indicating that trademark registrations decrease the cost of equity even when we define trademark variables in alternative ways.

[Insert Table 8]

6. Conclusion

In this paper, we have examined the impact of trademarks on firms' implied cost of equity. By studying a sample of U.S. public firms during the period 1993-2017, we find that greater trademarking activity decreases firms' cost of equity financing. To establish causality, we use three federal trademark laws as quasi-natural experiments. The results support our causal interpretation. Further evidence shows that trademarks reduce the cost of equity through the *information asymmetry channel*, the *investor recognition channel*, and the *disciplinary channel*. Moreover, we

[16] We define a trademark as a marketing trademark if the trademark has no text (i.e., purely logos), text comprising four or more words (i.e., advertising slogans) or a subsequent mark with the same text in the same class (i.e., updating logos). The rest are defined as product trademarks.

find that trademarks' effect on the cost of equity may ultimately enhance firm performance and investments.

Overall, our study contributes to the cost of equity literature by showing that trademarks, as an important class of intangible assets, reduce firms' financing costs in the equity market. It also contributes to the emerging literature on the impact of trademarks on firm outcomes. Our paper suggests that trademarks play an important role in alleviating firms' equity financing costs, and it thus clarifies the underlying mechanism through which trademarks create value.

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Figure 1. Residual Implied Cost of Equity Capital

This figure displays the yearly average residual implied cost of equity for the treatment (i.e., firms with famous trademark) and control groups (i.e., firms without famous trademark) after panel regressions with industry-by-year fixed effects. The 95% confidence intervals for each group mean are also displayed.

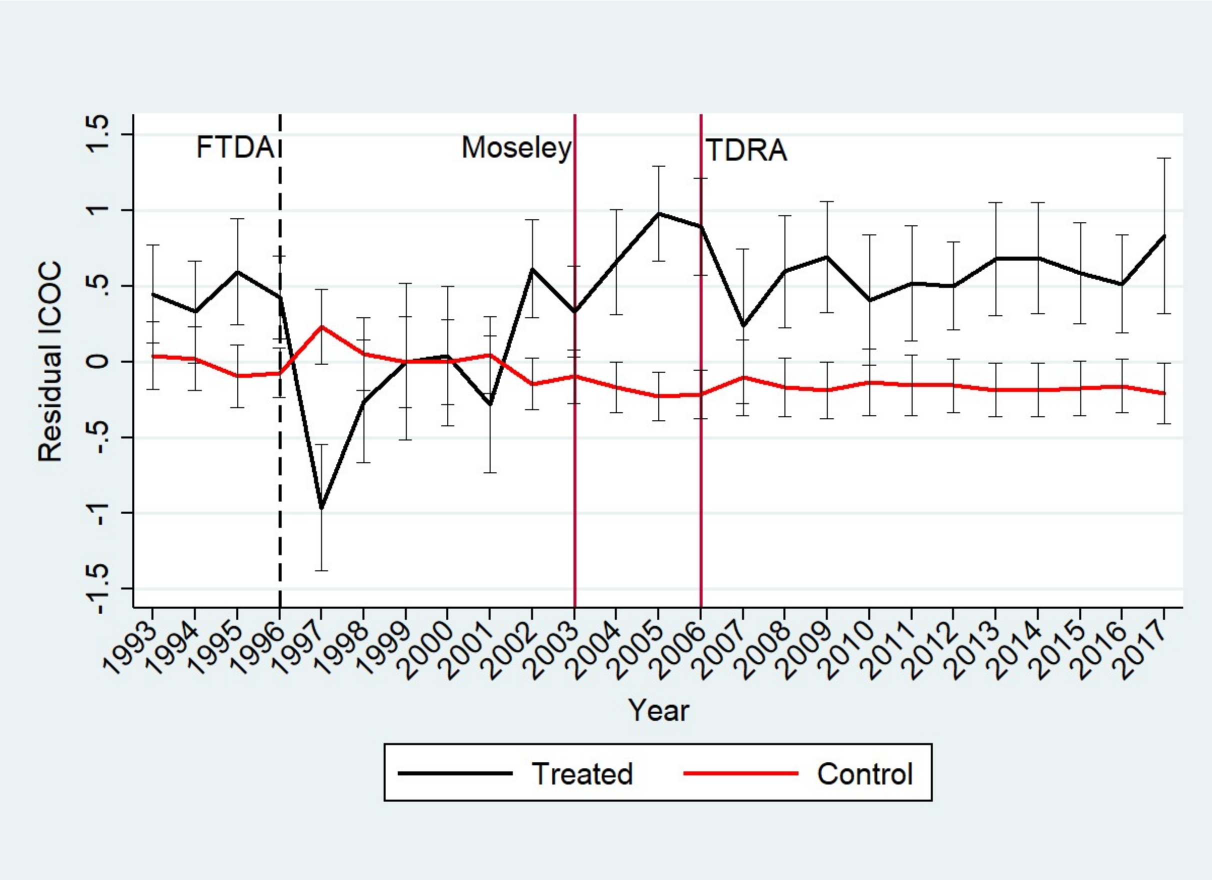

Table 1. Descriptive Statistics and Univariate Correlations

Panel A presents the number of observations, mean, standard deviation, and 25th, 50th, and 75th percentile values of the variables used in the baseline regression. Panel B compares the means of the cost of equity (*ICOC*) between firms with at least one valid trademark and firms without a valid trademark. Panel C presents the pairwise correlations of the variables used in the baseline regression. *ICOC* is the mean of four implied cost of equity estimates described in Appendix A. *Log(1+TM)* is the natural logarithm of one plus the number of valid trademarks held by a firm. *Log(Equity)* is the natural logarithm of firms' market capitalization (in millions), adjusted for inflation using 2018 dollars. *BM* is book value of equity scaled by market value of equity. *Leverage* is book value of long-term debt plus book value of debt in current liabilities scaled by total assets. *ROA* is income before extraordinary items scaled by total assets. *Momentum* is stock return over the fiscal year. *Beta* is estimated by regressing daily stock returns over the fiscal year on the contemporaneous CRSP value-weighted market returns, correcting for nonsynchronous trading. *Idiosyncratic Risk* is the annualized standard deviation of the residuals from regressing daily stock returns over the fiscal year on the contemporaneous CRSP value-weighted market returns, correcting for nonsynchronous trading. *Dispersion* is the standard deviation of analysts' estimates scaled by the consensus forecast for the next period's earnings. *LTG* is the median analyst forecast of the long-term earnings growth rate. Variable definitions are provided in Appendix B. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Descriptive Statistics

	N	*Mean*	*Std. Dev.*	*p25*	*p50*	*p75*
	[1]	[2]	[3]	[4]	[5]	[6]
ICOC	43,464	12.064	4.793	8.669	10.964	14.334
Log(1+TM)	43,464	1.494	1.859	0.000	0.000	2.890
Log(Equity)	43,464	7.061	1.754	5.821	6.974	8.183
BM	43,464	0.480	0.345	0.246	0.406	0.628
Leverage	43,464	0.218	0.193	0.034	0.194	0.340
ROA	43,464	0.053	0.080	0.023	0.055	0.092
Momentum	43,464	0.125	0.539	-0.204	0.047	0.325
Beta	43,464	1.101	0.630	0.663	1.027	1.455
Idiosyncratic Risk	43,464	0.410	0.203	0.260	0.364	0.515
Dispersion	32,911	0.041	0.120	0.007	0.016	0.039
LTG	32,911	0.167	0.086	0.110	0.150	0.200

Panel B: Trademark vs. Non-Trademark Firms

	Firms with at least one valid trademark	*Firms without valid trademark*	*Difference [1] – [2]*	*t-value*
	[1]	[2]	[3]	[4]
ICOC	11.434	12.658	-1.224***	-26.835

Table 1. (Cont.)

Panel C: Pairwise Correlations												
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
ICOC	[1]	1.000										
Log(1+TM)	[2]	-0.162***	1.000									
Log(Equity)	[3]	-0.421***	0.312***	1.000								
BM	[4]	0.215***	-0.079***	-0.392***	1.000							
Leverage	[5]	0.088***	-0.028***	0.096***	-0.012**	1.000						
ROA	[6]	-0.113***	0.067***	0.223***	-0.277***	-0.199***	1.000					
Momentum	[7]	-0.166***	-0.027***	-0.177***	0.180***	0.007	-0.149***	1.000				
Beta	[8]	-0.031***	-0.023***	0.116***	-0.101***	-0.068***	-0.047***	-0.025***	1.000			
Idiosyncratic Risk	[9]	0.375***	-0.247***	-0.572***	0.191***	-0.115***	-0.248***	0.179***	0.105***	1.000		
Dispersion	[10]	0.114***	-0.062***	-0.132***	0.081***	0.044***	-0.132***	-0.012**	0.027***	0.107***	1.000	
LTG	[11]	0.167***	-0.181***	-0.214***	-0.178***	-0.231***	-0.008	-0.018***	0.222***	0.414***	0.038***	1.000

Table 2. Trademarks and Cost of Equity Capital

This table reports the OLS regression results from estimating the impact of trademarks on the cost of equity. The dependent variable, *ICOC*, is the mean of four implied cost of equity estimates described in Appendix A. *Log(1+TM)* is the natural logarithm of one plus the number of valid trademarks held by a firm. Control variables, including firm size (*Log(Equity)*), book-to-market ratio (*BM*), financial leverage (*Leverage*), return on assets (*ROA*), return momentum (*Momentum*), beta (*Beta*), and idiosyncratic risk (*Idiosyncratic Risk*), are included in Column 3. Additional control variables, including analyst forecast dispersion (*Dispersion*) and long-term growth rate (*LTG*), are included in Column 4. Variable definitions are provided in Appendix B. Robust t-statistics, adjusted for industry-by-year level clustering, are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Predicted Signs	[1]	[2]	[3]	[4]
Log(1+TM)	-	-0.419***	-0.351***	-0.032***	-0.046***
		(-22.696)	(-26.713)	(-3.188)	(-4.699)
Log(Equity)	-			-0.665***	-0.444***
				(-29.813)	(-18.353)
BM	+			1.372***	1.783***
				(14.720)	(16.104)
Leverage	+			3.652***	3.492***
				(24.161)	(24.063)
ROA	±			-0.190	1.164***
				(-0.502)	(2.943)
Momentum	-			-1.868***	-1.776***
				(-29.798)	(-24.954)
Beta	+			0.317***	0.335***
				(6.022)	(5.915)
Idiosyncratic Risk	+			5.075***	4.088***
				(22.118)	(18.407)
Dispersion	+				1.226***
					(5.495)
LTG	+				1.874***
					(4.260)
Industry-by-Year FE		No	Yes	Yes	Yes
N		43,464	43,464	43,464	32,911
Adj. R^2		0.026	0.317	0.479	0.499

Table 3. DiD Estimation

This table reports the DiD estimation results from estimating the impact of trademarks on the cost of equity three years before and after the passage of the FTDA in 1996, the decision on Moseley v. V. Secret Catalogue, Inc., in 2003 and the passage of the TDRA in 2006 in Columns 1-6, respectively. The dependent variable, *ICOC*, is the mean of four implied cost of equity estimates described in Appendix A. *Log(1+Famous)* is the natural logarithm of one plus the number of famous trademarks held by a firm in the fiscal year end prior to the event. *Post* indicates the years after the event. Control variables, including firm size (*Log(Equity)*), book-to-market ratio (*BM*), financial leverage (*Leverage*), return on assets (*ROA*), return momentum (*Momentum*), beta (*Beta*), and idiosyncratic risk (*Idiosyncratic Risk*), are included in Columns 1, 3, and 5. Additional control variables, including analyst forecast dispersion (*Dispersion*) and long-term growth rate (*LTG*), are included in Columns 2, 4, and 6. Variable definitions are provided in Appendix B. Robust t-statistics, adjusted for industry-by-year level clustering, are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Event =	*FTDA*		*Moseley v. V. Secret Catalogue, Inc.*		*TDRA*	
	[1]	[2]	[3]	[4]	[5]	[6]
Log(1+Famous)	0.047	-0.074	-0.039	-0.062	0.099***	0.061
	(1.021)	(-1.575)	(-0.956)	(-1.421)	(2.629)	(1.597)
Log(1+Famous) × Post	-0.209***	-0.108*	0.141***	0.122**	-0.021	0.030
	(-3.140)	(-1.675)	(2.609)	(2.166)	(-0.370)	(0.563)
Log(Equity)	-0.811***	-0.621***	-0.714***	-0.522***	-0.558***	-0.300***
	(-17.181)	(-13.588)	(-20.002)	(-15.318)	(-18.427)	(-8.431)
BM	1.147***	1.732***	1.137***	1.431***	0.877***	1.265***
	(6.158)	(7.256)	(6.384)	(6.646)	(5.414)	(6.572)
Leverage	3.939***	4.015***	2.982***	2.643***	2.767***	2.573***
	(12.451)	(12.401)	(10.981)	(10.467)	(9.977)	(11.710)
ROA	-1.617**	-0.084	-1.808**	-0.427	-0.358	0.959
	(-2.213)	(-0.113)	(-2.445)	(-0.627)	(-0.542)	(1.562)
Momentum	-2.338***	-2.281***	-1.344***	-1.197***	-1.324***	-1.249***
	(-25.353)	(-21.456)	(-13.051)	(-11.726)	(-11.154)	(-9.881)
Beta	0.685***	0.731***	0.084	0.122	0.173*	0.231**
	(7.658)	(8.097)	(0.882)	(1.226)	(1.929)	(2.495)
Idiosyncratic Risk	4.609***	4.275***	4.454***	3.033***	6.054***	4.751***
	(11.962)	(11.662)	(11.379)	(7.845)	(14.756)	(11.252)
Dispersion		1.124***		1.526***		1.417***
		(3.245)		(2.826)		(3.518)
LTG		0.848		2.582**		4.182***
		(0.989)		(2.579)		(4.076)
Industry-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	11,907	9,151	10,138	8,020	10,733	8,398
Adj. R^2	0.387	0.387	0.339	0.324	0.375	0.388

Table 4. Mechanisms: The Information Asymmetry Channel

This table reports the OLS regression results from estimating whether the impact of trademarks on the cost of equity is strengthened for firms with greater information asymmetry. The dependent variable, *ICOC*, is the mean of four implied cost of equity estimates described in Appendix A. *Log(1+TM)* is the natural logarithm of one plus the number of valid trademarks held by a firm. We employ analyst coverage (*Log(1+Analyst)*) and *Bid-Ask Spread* as proxies for information asymmetry. Control variables, including firm size (*Log(Equity)*), book-to-market ratio (*BM*), financial leverage (*Leverage*), return on assets (*ROA*), return momentum (*Momentum*), beta (*Beta*), idiosyncratic risk (*Idiosyncratic Risk*), analyst forecast dispersion (*Dispersion*), and long-term growth rate (*LTG*), are included in each regression, but their coefficients are not reported for brevity. Variable definitions are provided in Appendix B. Robust t-statistics, adjusted for industry-by-year level clustering, are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable =	*ICOC*	
	[1]	[2]
Log(1+TM)	-0.314***	0.041*
	(-7.640)	(1.793)
Log(1+Analyst)	-0.361***	
	(-5.443)	
Log(1+TM) × Log(1+Analyst)	0.105***	
	(7.204)	
Bid-Ask Spread		20.782***
		(4.079)
Log(1+TM) × Bid-Ask Spread		-2.877***
		(-3.519)
Controls	Yes	Yes
Industry-by-Year FE	Yes	Yes
N	32,911	32,911
Adj. R^2	0.500	0.500

Table 5. Mechanisms: The Investor Recognition Channel

This table reports the OLS regression results from estimating whether the impact of trademarks on the cost of equity is strengthened for firms with lower investor recognition. The dependent variable, *ICOC*, is the mean of four implied cost of equity estimates described in Appendix A. *Log(1+TM)* is the natural logarithm of one plus the number of valid trademarks held by a firm. We employ the number of institutional owners (*Log(1+Inst)*), the percentage of institutional ownership (*%InstOwn*) and media coverage (*Log(1+Media)*) as proxies for investor recognition. Control variables, including firm size (*Log(Equity)*), book-to-market ratio (*BM*), financial leverage (*Leverage*), return on assets (*ROA*), return momentum (*Momentum*), beta (*Beta*), idiosyncratic risk (*Idiosyncratic Risk*), analyst forecast dispersion (*Dispersion*), and long-term growth rate (*LTG*), are included in each regression, but their coefficients are not reported for brevity. Variable definitions are provided in Appendix B. Robust t-statistics, adjusted for industry-by-year level clustering, are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable =		*ICOC*	
	[1]	[2]	[3]
Log(1+TM)	-0.658***	-0.122***	-0.128***
	(-8.828)	(-2.727)	(-6.209)
Log(1+Inst)	0.041		
	(0.456)		
Log(1+TM) ×Log(1+Inst)	0.118***		
	(9.008)		
%InstOwn		-0.709***	
		(-4.596)	
Log(1+TM) × %InstOwn		0.141**	
		(2.486)	
Log(1+Media)			-0.003
			(-0.312)
Log(1+TM) × Log(1+Media)			0.021***
			(6.080)
Controls	Yes	Yes	Yes
Industry-by-Year FE	Yes	Yes	Yes
N	21,537	21,532	22,359
Adj. R^2	0.502	0.500	0.374

Table 6. Mechanisms: The Disciplinary Channel

This table reports the OLS regression results from estimating the impact of trademarks on the implied cost of equity achieved through the disciplinary channel. Panel A examines whether the impact of trademarks on the cost of equity is strengthened for firms with weaker corporate governance. We employ the percentage of independent directors on the board (*%Board Independence*) and the Entrenchment Index (*E-index*) as corporate governance proxies. *Log(1+TM)* is the natural logarithm of one plus the number of valid trademarks held by a firm. Panel B examines the direct impact of trademarks on corporate misconduct. The dependent variable is one of the corporate misconduct proxies, including the alpha of the portfolios constructed from insider trades (*Alpha*) and the number of financial misconduct activities (*Log(1+Misconducts)*). Control variables, including firm size (*Log(Equity)*), book-to-market ratio (*BM*), financial leverage (*Leverage*), return on assets (*ROA*), return momentum (*Momentum*), beta (*Beta*), idiosyncratic risk (*Idiosyncratic Risk*), analyst forecast dispersion (*Dispersion*), and long-term growth rate (*LTG*), are included in each regression, but their coefficients are not reported for brevity. Variable definitions are provided in Appendix B. Robust t-statistics, adjusted for industry-by-year level clustering, are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Corporate Governance		
Dependent Variable =	*ICOC*	
	[1]	[2]
Log(1+TM)	-0.323***	-0.027
	(-6.181)	(-1.199)
%Board Independence	-0.296	
	(-1.235)	
Log(1+TM) × %Board Independence	0.393***	
	(5.730)	
E-index		0.014
		(0.481)
Log(1+TM) × E-index		-0.015*
		(-1.751)
Controls	Yes	Yes
Industry-by-Year FE	Yes	Yes
N	15,829	12,596
Adj. R^2	0.481	0.464
Panel B: Misconduct		
Dependent Variable =	*Alpha*	*Log (1+Misconducts)*
	[1]	[2]
Log(1+TM)	-0.062*	-0.002*
	(-1.877)	(-1.771)
Controls	Yes	Yes
Industry-by-Year FE	Yes	Yes
N	17,779	30,235
Adj. R^2	0.039	0.066

Table 7. Outcomes: Firm Performance and Investments

This table reports the OLS regression results from estimating the impact of trademarks on firm performance. The dependent variable is one of the firm performance proxies, including return on assets (*ROA*), gross margin (*Gross Margin*), demand uncertainty (*Demand Uncertainty*), and return volatility (*RetVol*), or one of the firm investment proxies, including SG&A expenses scaled by total sales (*SG&A*), R&D expenses scaled by total sales (*R&D*), and the number of employees (*Log(Emp)*). *Log(1+TM)* is the natural logarithm of one plus the number of valid trademarks held by a firm. Control variables, including firm size (*Log(Equity)*), book-to-market ratio (*BM*), financial leverage (*Leverage*), return on assets (*ROA*), return momentum (*Momentum*), beta (*Beta*), idiosyncratic risk (*Idiosyncratic Risk*), analyst forecast dispersion (*Dispersion*), and long-term growth rate (*LTG*), are included in each regression, but their coefficients are not reported for brevity. Variable definitions are provided in Appendix B. Robust t-statistics, adjusted for industry-by-year level clustering, are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable =	*ROA*	*Gross Margin*	*Demand Uncertainty*	*RetVol*	*SG&A*	*R&D*	*Log(Emp)*
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Log(1+TM)	0.000**	0.005***	-0.010***	-0.001***	0.007***	0.002***	0.026***
	(2.224)	(6.792)	(-18.210)	(-5.541)	(11.793)	(5.637)	(7.212)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	32,884	32,872	32,894	32,054	31,110	32,881	32,194
Adj. R^2	0.415	0.401	0.250	0.601	0.441	0.429	0.739

Table 8. Alternative Trademark Measures

This table reports the OLS regression results from estimating the impact of trademarks on the cost of equity using alternative trademark measures. The dependent variable, *ICOC*, is the mean of four implied cost of equity estimates described in Appendix A. *TM_D* is a dummy variable that equals one if a firm holds at least one valid trademark in a year and zero otherwise. *TM_Intensity* is the number of valid trademarks held by a firm scaled by total assets. *Log(1+Classes)* is the natural logarithm of one plus the number of unique trademark classes of trademarks held by a firm. *Log(1+NewTM)* is the natural logarithm of one plus the number of newly launched trademarks filed by a firm. *Log(1+ProductTM)* (*Log(1+MarketingTM)*) is the natural logarithm of one plus the number of valid product (marketing) trademarks held by a firm. *Log(1+ParentTM)* (*Log(1+SubsidiaryTM)*) is the natural logarithm of one plus the number of valid trademarks filed and held by the parent firm (subsidiary firm/firms). Control variables, including firm size (*Log(Equity)*), book-to-market ratio (*BM*), financial leverage (*Leverage*), return on assets (*ROA*), return momentum (*Momentum*), beta (*Beta*), idiosyncratic risk (*Idiosyncratic Risk*), analyst forecast dispersion (*Dispersion*), and long-term growth rate (*LTG*), are included in each regression, but their coefficients are not reported for brevity. Variable definitions are provided in Appendix B. Robust t-statistics, adjusted for industry-by-year level clustering, are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
TM_D	-0.282***							
	(-6.758)							
TM_Intensity		-1.734***						
		(-5.360)						
Log(1+Classes)			-0.082***					
			(-4.931)					
Log(1+NewTM)				-0.102***				
				(-4.925)				
Log(1+ProductTM)					-0.038***			
					(-4.010)			
Log(1+MarketingTM)						-0.006		
						(-0.436)		
Log(1+ParentTM)							-0.051***	
							(-5.084)	
Log(1+SubsidiaryTM)								0.013
								(1.067)
Controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-by-Year FE		Yes	Yes	Yes	Yes	Yes	Yes	Yes
N		32,911	32,911	32,911	32,911	32,911	32,911	32,911
Adj. R^2		0.500	0.499	0.499	0.499	0.499	0.499	0.499

Appendix A. Estimating the Implied Cost of Equity Capital

Following the previous literature, we employ accounting-based valuation models to estimate the *ex ante* rate of return implied in current stock prices and analysts' earnings forecasts (Dhaliwal, Heitzman, and Li, 2006; Dhaliwal, Judd, Serfling, and Shaikh, 2016). To facilitate the discussion, we define the variables used in the following models.

P_t: Price per share of a firm's common stock in June of year *t*.

B_t: Book value of equity from the most recent available financial statement in year *t* scaled by the number of common shares outstanding in June of year *t*.

B_{t+i}: Expected book value per share computed under the clean-surplus assumption, computed as $B_{t+i} = B_{t+i-1} + FEPS_{t+i} - k \cdot FEPS_{t+i}$.

$FEPS_{t+i}$: Forecasted earnings per share (EPS) for year *t+i*. $FEPS_{t+1}$ ($FEPS_{t+2}$, $FEPS_{t+3}$) equals the one- (two-, three-) year-ahead consensus EPS forecasts in June of year *t*. When data are unavailable, $FEPS_{t+3} = FEPS_{t+2}(1 + LTG)$. LTG is the consensus long-term earnings growth rate forecast in June of year *t*.

k: Dividend payout ratio, computed as $k = DPS_{t-1}/EPS_{t-1}$. DPS_{t-1} is dividends per share in year *t-1*. EPS_{t-1} is the actual EPS in year *t-1*. For negative EPS_{t-1}, *k* is set to 6%.

r_{GLS}, r_{CT}, r_{OJN}, r_{MPEG}: Implied cost of equity estimates computed by solving the following valuation equations.

r_f: Risk-free rate equals the yield on a 10-year Treasury note in June of year *t*.

1. Gebhardt, Lee, and Swaminathan (2001) (GLS)

The GLS measure is based on the residual income valuation model derived from the discounted dividend model. In this model, the GLS expression is

$$P_t = B_t + \frac{FROE_{t+1} - r_{GLS}}{1 + r_{GLS}} B_t + \frac{FROE_{t+2} - r_{GLS}}{(1 + r_{GLS})^2} B_{t+1} + TV, \quad (B1)$$

where

TV: Terminal value, computed as $TV = \sum_{i=3}^{T-1} \frac{FROE_{t+i} - r_{GLS}}{(1 + r_{GLS})^i} B_{t+i-1} + \frac{FROE_{t+T} - r_{GLS}}{r_{GLS}(1 + r_{GLS})^{T-1}} B_{t+T-1}$. The forecast time horizon, *T*, equals 12.

$FROE_{t+i}$: Forecasted return on equity (ROE) for year *t+i*. For the first three years, $FROE_{t+i} = FEPS_{t+i}/B_{t+i-1}$. Beyond the third year, $FROE_{t+i}$ is a linear interpolation to the moving industry median for the prior 5-10 years. Firms are grouped into 48 industries as defined in Fama and French (1997).

2. Claus and Thomas (2001) (CT)

The CT measure is based on the residual income valuation model derived from the discounted dividend model. In this model, the CT expression is

$$P_t = B_t + \sum_{i=1}^{5} \frac{ae_{t+i}}{(1+r_{CT})^i} + \frac{ae_{t+5}(1+g_{ae})}{(r_{CT}-g_{ae})(1+r_{CT})^5}, \quad (B2)$$

where

ae_{t+i}: Expected abnormal earnings for year i, computed as $FEPS_{t+i} - r_{CT} \cdot B_{t+i-1}$. For years *t+3*, *t+4*, and *t+5*, $FEPS_{t+i}$ equals the consensus forecasts for that year. When data are unavailable, $FEPS_{t+i} = FEPS_{t+i-1}(1 + LTG)$.

g_{ae}: Growth rate of abnormal earnings beyond year *t+5*, computed as $r_f - 3\%$.

3. Ohlson and Juettner-Nauroth (2005) (OJN)

Gode and Mohanram (2003) use the following implementation of the Ohlson and Juettner-Nauroth (2005) model of the cost of equity capital:

$$r_{OJN} = A + \sqrt{A^2 + (\frac{FEPS_{t+1}}{P_t})(g_2 - (r_f - 3\%))}, \quad (B3)$$

where

A: Computed as $0.5((r_f - 3\%) + DPS_{t+1}/P_t)$, where $DPS_{t+1} = k \cdot FEPS_{t+1}$.

g_2: The short-term earnings growth rate equals the consensus long-term earnings growth forecast when available; otherwise, $FEPS_{t+2}/FEPS_{t+1} - 1$. The implementation of this model requires $EPS_{t+1}>0$ and $EPS_{t+2}>0$.

4. The modified PEG ratio model by Easton (2004) (MPEG)

$$P_t = \frac{FEPS_{t+2} + r_{MPEG} \cdot DPS_{t+1} - FEPS_{t+1}}{r_{MPEG}^2}. \quad (B4)$$

This model requires $FEPS_{t+2} \geqslant FEPS_{t+1} > 0$.

Appendix B. Variable Definitions

Variable	Abbreviation	Definition	Source
Cost of Equity Variable			
Implied Cost of Equity Capital	*ICOC*	The mean of four implied cost of equity estimates described in Appendix A.	IBES
Trademark Variables			
No. of Trademarks	*Log(1+TM)*	The natural logarithm of one plus the number of valid trademarks held by a firm.	USPTO
No. of Famous Trademarks	*Log(1+Famous)*	The natural logarithm of one plus the number of famous trademarks held by a firm at the end of the fiscal year prior the event. A famous trademark is defined as a trademark that had been registered for more than twenty years and was still active in the event year.	USPTO
Trademark Dummy	*TM_D*	Dummy variable that equals one if a firm holds at least one valid trademark in a year and zero otherwise.	USPTO
Trademark Intensity	*TM_Intensity*	The number of valid trademarks held by a firm scaled by total assets.	USPTO
Trademark Diversity	*Log(1+Classes)*	The natural logarithm of one plus the number of unique trademark classes of trademarks held by a firm.	USPTO
No. of New Trademark	*Log(1+NewTM)*	The natural logarithm of one plus the number of newly launched trademarks filed by a firm.	USPTO
No. of Product Trademarks	*Log(1+ProductTM)*	The natural logarithm of one plus the number of valid product trademarks held by a firm.	USPTO
No. of Marketing Trademarks	*Log(1+MarketingTM)*	The natural logarithm of one plus the number of valid marketing trademarks held by a firm.	USPTO
No. of Parent Trademarks	*Log(1+ParentTM)*	The natural logarithm of one plus the number of valid product trademarks filed and held by the parent firm.	USPTO
No. of Subsidiary Trademarks	*Log(1+SubsidiaryTM)*	The natural logarithm of one plus the number of valid marketing trademarks filed and held by the subsidiary firm/firms.	USPTO

Firm-Level Variables (Baseline Controls)			
Firm Size	*Log(Equity)*	The natural logarithm of firms' market capitalization (in millions), adjusted for inflation using 2018 dollars.	Compustat
Book-to-Market Ratio	*BM*	Book value of equity scaled by market value of equity.	Compustat
Financial Leverage	*Leverage*	Book value of long-term debt plus book value of debt in current liabilities scaled by total assets.	Compustat
Return on Assets	*ROA*	Income before extraordinary items scaled by total assets.	Compustat
Return Momentum	*Momentum*	The stock return over the fiscal year.	CRSP
Stock Return Beta	*Beta*	Beta is estimated by regressing daily stock returns over the fiscal year on the contemporaneous CRSP value-weighted market returns, correcting for nonsynchronous trading (Scholes and Williams, 1977).	Compustat
Idiosyncratic Risk	*Idiosyncratic Risk*	Idiosyncratic risk is the annualized standard deviation of the residuals from regressing daily stock returns over the fiscal year on the contemporaneous CRSP value-weighted market returns, correcting for nonsynchronous trading (Scholes and Williams, 1977).	Compustat
Analyst Forecast Dispersion	*Dispersion*	The standard deviation of analysts' estimates scaled by the consensus forecast for the next period's earnings.	IBES
Long-Term Growth Rate	*LTG*	The median analyst forecast of the long-term earnings growth rate.	IBES
Firm-Level Variables (Others)			
Analyst Coverage	*Log(1+Analyst)*	The natural logarithm of one plus the number of analysts covering the firm.	IBES
Bid-Ask Spread	*Bid-Ask Spread*	The average bid-ask spread divided by the midpoint of the spread over the year.	CRSP
No. of Institutional Owners	*Log(1+Inst)*	The natural logarithm of one plus the number of institutional owners.	Thomson Reuters13F

Institutional Ownership	*InstOwn%*	The percentage of institutional ownership.	Thomson Reuters13F
Media Coverage	*Log(1+Media)*	The natural logarithm of one plus the number of news articles covering the firm.	RavenPack
Board Independence	*%Board Independence*	The percentage of independent directors on the board.	BoardEx
Entrenchment Index	*E-index*	The Entrenchment Index by Bebchuk, Cohen, Ferrell (2009). The index ranges from 0 (best) to 6 (worst).	Lucian Bebchuk's website
Insider Trading	*Alpha*	The profitability of insider trading, defined as the annualized abnormal return from the Carhart (1997) four-factor model estimated over the 180 calendar days after the transaction date.	Thomson Reuters Insiders Filing
No. of Financial Misconduct Activities	*Log(1+Misconducts)*	The natural logarithm of one plus the number of financial misconduct activities.	Audit Analytics Non-Reliance Restatement
Gross Margin	*Gross Margin*	Sales minus the cost of goods sold scaled by sales.	Compustat
Demand Uncertainty	*Demand Uncertainty*	The standard deviation of sales growth in the five-year window surrounding the current year.	Compustat
Return Volatility	*RetVol*	The standard deviation of monthly stock returns in the year.	CRSP
SG&A Expenses	*SG&A*	Selling, general, and administrative expenses scaled by sales.	Compustat
R&D Expenses	*R&D*	Research and development expenses scaled by sales.	Compustat
No. of Employees	*Log(Emp)*	The natural logarithm of the number of employees.	Compustat