



Does protection of trade secrets matter for firms' access to external capital?

Mohamed Shaker Ahmed^a, Layal Isskandarani^b, Taimur Sharif^c,
 Mohammad Zoynul Abedin^{d,*}

^a Department of Business Administration, Cairo University, Egypt

^b Department of Finance, Performance and Marketing, Teesside University International Business School, Teesside University, Middlesbrough, United Kingdom

^c School of Management and Economics, University of Kurdistan Hewlêr, Kurdistan, Iraq

^d Department of Accounting and Finance, School of Management, Swansea University, Wales, United Kingdom

ARTICLE INFO

Keywords:

Protection of trade secrets
 External finance
 Inevitable disclosure doctrine (IDD) adoption
 Human capital
 Debt market
 Employee mobility

ABSTRACT

We investigate how protection of trade secrets affects firms' access to external finance. In our paper, we use the US state court recognition of the Inevitable Disclosure Doctrine (hereafter IDD) to gain exogenous variation in employee mobility, which protects trade secrets and prevents knowledge spillover to competitors. We also employ a sample of all non-financial constituents of the S&P 500 between 2005 and 2020. Overall, we find that firms in states adopting the IDD reduce their use of short-term debt, whereas they increase their use of long-term debt compared to those in states rejecting the IDD. For short-term finance, our extended analyses demonstrate that firm age negatively moderates the relationship between adoption of IDD and access to external finance, while CEO age, CEO gender, and CEO-holding MBA positively moderate this relationship. For long-term finance, our extended analyses demonstrate that firm age, CEO gender, and CEO-holding MBA negatively moderate the relationship between adoption of IDD and access to external finance, whereas CEO age, as a moderator, does not affect this relationship. The findings of this paper have significant implications for corporate boards, given that state courts' adoption of IDD is a viable determinant of the components of external funding.

1. Introduction

Trade secrets make significant contributions to safeguarding knowledge and other commercially sensitive information of businesses (Hall et al., 2014), such as “computer algorithms, financial data (e.g., pricing and cost information), business plans and strategies, customer and supplier contact lists, and product prototypes” (Guernsey et al., 2022, p. 2517), that lead to higher industry competitiveness and innovation (Hull, 2019). Corroborating the earlier survey outcomes of Cohen et al. (2000) and Arundel (2001), a recently conducted Marsh and Liberty Underwriters survey (as cited in Klasa et al., 2018) ranked trade secrets as the prime source of revenue generation, followed by trademarksTM and patents. On the contrary, exposition of trade secrets causes substantial financial damage to firms and erodes their competitive advantages over competitors. A US Trade Representative (USTR) report revealed that the

* Corresponding author.

E-mail addresses: mashaker@cu.edu.eg (M.S. Ahmed), l.isskandarani@tees.ac.uk (L. Isskandarani), taimur.sharif@ukh.edu.krd (T. Sharif), m.z.abedin@swansea.ac.uk (M.Z. Abedin).

<https://doi.org/10.1016/j.iref.2025.104221>

Received 6 July 2024; Received in revised form 19 March 2025; Accepted 29 May 2025

Available online 30 May 2025

1059-0560/© 2025 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

divulgence of trade secret costs the US economy **between \$300 billion and \$600 billion annually, in the forms of** contracted market share, loss of revenue, and so on (USTR, 2024). Loss of trade secrets also adversely affects firms' involvement in CSR activities (Flammer & Kacperczyk, 2019), earnings management (Gao et al., 2018), CEO compensation (Na, 2020), capital structure decisions (Klasa et al., 2018), investor confidence (USTR, 2024), and so on. One of the key channels of losing proprietary information to rivals is the mobility of human capital, i.e., talented and knowledgeable employees having awareness of trade secrets related to employer company's strategic plans, client database, and financial data (Almeling et al., 2011; Klasa et al., 2018). Given that human capital of high ex-ante mobility harms firm productivity and value (Abowd et al., 2005) and innovation (Png, 2017a), and damages competitive advantage by leaking trade secrets (Png, 2017a; 2017b; Glaeser, 2018; Klasa et al., 2018; Li et al., 2022; Wang, 2023), firms dependent on knowledge-based assets are obliged to retain key knowledgeable employees, restrict their job-hopping behaviour (Bates et al., 2009; He 2018; Chowdhury & Doukas, 2022), and so on.

The Industrial Revolution has enhanced the significance of the protection of trade secrets, given the rising R&D investments by companies. As a result, laws safeguarding trade secrets have been increasingly emerged to tackle issues associated with "industrial espionage and unfair competition" (Pilania and Nagpal, 2023, p.4). In the US, legal protections to trade secret have evolved since the late 1970s, led by a vital dual-track state-level legal system (Pooley, 1997), namely, the Uniform Trade Secrets Act (UTSA) and the Inevitable Disclosure Doctrine (IDD). In 1979, the UTSA was created by the US Uniform Law Commission and endorsed by the National Conference of Commissioners on Uniform State Laws to establish a consistent legal framework regarding trade secrets across the US (Wang, 2023). Although the IDD was implemented in some states prior to the UTSA (New York in 1919, Florida in 1960, Delaware in 1964, Michigan in 1966, and North Carolina in 1976), the protective capacity and pertinence of the IDD strengthened by following the UTSA-specified guiding principles since the latter's inception in 1979 (Guernsey et al., 2022) on the state level (Yeh, 2016). The stronger IDD aimed to lessen outside opportunities of CEOs/managers of firms headquartered in the IDD-compliant states, even if they have not signed an explicit non-compete or non-disclosure agreement with the firm (Canil et al., 2022; Flammer & Kacperczyk, 2019; Na, 2020). As per the IDD, firms may exercise their legal right to secure an injunction to block employment of current personnel and management who assume a similar position at a rival firm and pose a foreseeable risk of "threatened misappropriation" (Klasa et al., 2018; Guernsey et al., 2022; Chang et al., 2024). Given the empirical importance, the IDD adoption and employee mobility have been increasingly linked to finance and accounting issues such as corporate risk-taking (Colak & Korkeamäki, 2021), dividends and share repurchasing policies (Canil et al., 2022), corporate disclosure (Ali et al., 2019; Aobdia, 2018), acquisition activities (Chen et al., 2021; Younge et al., 2015), earnings management (Gao et al., 2018), value of cash holdings (Chowdhury & Doukas, 2022), capital structure decisions (Klasa et al., 2018), stock price crash risk (Hu et al., 2023), and corporate social responsibility (Flammer & Kacperczyk, 2019) in the Millennium decades.

Our research question is important for several reasons: First, finance is an essential component for the proper operation of any company organization. New and current firms cannot be established, sustained, or expanded without competent access to external financing. In turn, access to external funding is critical for supporting economic growth, increasing productivity, stimulating innovation, generating new goods, upgrading technology, driving value creation, and maintaining firms' competitiveness. As a result, collecting money from customers and paying it to suppliers may not be the best option for today's firms. Nowadays, businesses may need to pay financial obligations to employees, banks, state governments, suppliers, and others. Prior literature suggests that firms with restricted access to external funding are more likely to go bankrupt, fail, be less profitable, and be less likely to hire (Ayyagari et al., 2021; Chen & Matousek, 2020; Rahaman, 2011; Tsoukas, 2011). Second, the composition of capital structure (short-term and long-term) is an important decision and reflects to some extent not only the quality of the balance sheet but also the quality of firms' financial health (bib_bose_et_al_2019Bose et al., 2019). Second, access to external finance is a key determinant of firm performance, growth, and investment behavior (Knyazeva et al., 2009). Third, access to finance enhances productivity and, in turn, economic growth (Butler & Cornaggia, 2011). Fourth, debt can serve as a disciplining device to discipline corporate managers to restrict agency conflicts by reducing the cash flow held by corporate managers to entrench their managerial discretion and engage in self-interest behavior such as empire building and expense preference behavior (Liao et al., 2015).

In connection with rising significance of threats related to firms' IP status, a flurry of studies (e.g., MacKay and Phillips, 2005; Lyandres, 2006; Haushalter et al., 2007; Frésard, 2010; Valta, 2012; Hoberg et al., 2014) have investigated the nexus between firms' competitive threats and their financial policies. As an external factor to firms, robust trade secrets laws appear to show significant association with larger volume of innovation and reduced patenting activity (Png, 2017a; 2017b; Chang et al., 2024), implying less reliance of firms with protected trade secrets on external financing, leading to fall in the debt level. On the contrary, theoretical scholarship (e.g., DeAngelo et al., 2011) documented firms' strategic use of leverage to manage unforeseen Black Swan events and associated funding needs. In addition to this, empirical studies (e.g., Kerr and Nanda, 2015; Klasa et al., 2018) found evidence of firms' use of debt to finance intensifications of R&D activities, stimulated by the greater IP protection by the IDD (Png, 2017a), leading to further rise in debt use in the long run (Guernsey et al., 2022). Klasa et al. (2018) in particular suggested about 14 %–19 % rise in the net book and market leverage ratios of firms headquartered in the IDD-compliant states. Given these mixed outcomes of prior research, it is evident that the potential loss of trade secrets and the resulting competitive threats influence firms' capital structure choices (Chowdhury & Doukas, 2022; Klasa et al., 2018). On the flip side, given that firms with restricted access to external funding are more likely to go bankrupt or struggle financially (Ayyagari et al., 2021; Chen & Matousek, 2020; Rahaman, 2011; Tsoukas, 2011), the potential loss of trade secrets and the resulting competitive threats will have impacts on firms' capital structure choices (Chowdhury & Doukas, 2022; Klasa et al., 2018). In light of this backdrop and the significant nexus between human capital and firms' cash holdings (He, 2018), it is vital to scrutinise the connectedness of the IDD with external finance through its potential power to moderate the uncertainty caused by human capital of high ex-ante mobility (Chowdhury & Doukas, 2022). Furthermore, with the proliferation of high-tech firms and knowledge-based industries, legal protection of human capital has become more critical than ever (Flammer &

Kacperczyk, 2019; Kim & Marschke, 2005; Song et al., 2003; Wezel et al., 2006). Despite its importance, how the implementation of IDD affects firms' access to external finance is poorly understood.

This research investigates the relationship between IDD adoption and access to external financing. To accomplish so, we employ a difference-in-differences estimator on data from all non-financial corporations in the S&P 500 from 2005 to 2020. The adoption of IDD by state courts serves as a proxy for employee mobility. If embraced, it allows businesses to keep their valuable personnel, secure trade secrets, and avoid knowledge spillover and relationship transfer. According to Ali et al. (2019) and Klasa et al. (2018), the treatment group comprises of firms in states that have adopted the IDD, whereas the control group consists of firms in states that have rejected the IDD.

Our findings suggest that the adoption of IDD limits important directors outside options, prompting them to lower corporate disclosure. This leads to higher information asymmetry and financial constraints, causing firms to reduce their use of short-term debt. On the other hand, the adoption of IDD allows firms to keep their directors and valuable personnel and, as a result, their human capital value, which is expected to leverage innovation, as well as to maintain their long-term competitive advantages. This causes businesses to increase their use of long-term debt. For short-term finance, our extended analyses show that company age has a negative moderating effect on the association between IDD adoption and access to external finance, but CEO age, gender, and MBA-holding status have a positive moderating effect. For long-term financing, our extended analyses show that firm age, CEO gender, and MBA-holding CEOs all negatively influence the association between IDD adoption and access to external funding, although CEO age has no effect on this relationship.

This work provides several contributions to the existing literature. First, Klasa et al. (2018) analyse how IDD adoption affects capital structure decisions. They claim that when confronted with substantial competitive risks, businesses choose for conservative capital structure policy. As a result, the adoption of IDD, which protects trade secrets by reducing knowledge spillover and relationship transfer, encourages firms to have greater financial leverage. Our paper builds on this foundational work because little is known about the relationship between IDD adoption and debt composition or the structure of firms' external financing. Second, it is the first to link IDD adoption to external capital access, which is a critical issue because it affects business creation, survival, and growth. Third, it combines two separate lines of study on the adoption of IDD by state courts and access to external finance, providing new evidence on how this adoption may limit the firm's access to short-term debt while increasing access to long-term debt. Fourth, this extends the increasing stream of research on finance and labor. The extant body of knowledge, such as Klasa et al. (2018), Kuzmina (2023), Serfling (2016), Simintzi et al. (2015), and Marciukaityte (2015), looked into labor protection laws, right-to-work laws, and employee flexibility and their influence on the whole capital structure (financial leverage ratios). The impact on the composition of the capital structure remains an unresolved issue. This paper endeavours to fill this gap in the literature.

The reminder of the paper is structured as follows: Section 2 reviews the relevant literature and develops the research hypotheses. Section 3 describes the data and methodology. Section 4 discusses the empirical results, including our tests for endogeneity. Section 5 presents the concluding remarks, practical implications, and recommendations for future research.

2. Literature review

2.1. Nexus between IDD and human capital with ex-ante mobility

Becker's (1962) human capital theory assumes that investing in humanity produces economic benefits for individuals, organizations, and society as a whole. This investment specificity distinguishes consumer expenditures from human capital expenditures. training and education are usually regarded as the most important human capital investments since they lead to healthier and more nutritious outcomes. As a result, the human capital theory describes how training and education are the primary drivers of human resource investments. Furthermore, human learning capacities are as valuable as other production elements and resources. According to Becker (1962), corporations are typically hesitant to invest in human capital because the mobility of human capital may prevent them from obtaining a return on their investment. Prior research has demonstrated that human capital is not always anchored in specific individuals, but rather in teamwork, relationships, and networking among individuals. Furthermore, human capital includes team-specific elements such as shared values, customs, trust, and the like. As a result, the full use of humans necessitates not just the talents of individual team members, but also the collective capabilities of the entire team (Chen et al., 2021; Kogut & Zander, 1992).

With regard to human capital with ex-ante mobility, contemporary research has focused on studying the influence of various characteristics of CEOs in corporate decision-making. For instance, CEO ability (Custódio et al., 2013, 2019), CEO age (Serfling, 2014), CEO professional experience (Dittmar & Duchin, 2016), CEO tenure (Simsek, 2007), CEO education (King et al., 2016), and CEO gender (Faccio et al., 2016), CEOs' outside work options (Liu, 2014; Stannard & Guthrie, 2021), and so on. Earlier, Bertrand and Schoar (2003) evaluated a CEO's managerial style by CEO fixed effects, and suggested this as a significant predictor of a firm's strategic decisions and policies. The authors, however, did not explain whether CEOs' outside work opportunities influence their managing style or not. This influence is an inconclusive issue in the current literature evaluation. While Fee, Hadlock, and Pierce (2013) found no significant association between CEO outside alternatives and corporate choices and policies, Dittmar and Duchin (2016) discovered a strong relationship. In terms of CEO mobility, Bishara et al. (2015) found that 79 % of S&P 1500 companies have non-compete clauses (NCC) and 70 % have post-employment restrictions in their contracts. We contribute to this line of study by looking into the relationship between mobility of CEOs as a proxy of valuable employees and access to external finance.

According to Jeong (2003), corporations in jurisdictions that have adopted IDD can sue a former employee if there is a likelihood of irreparable harm occurring. As a result, they do not demand that a former employee be held accountable or that the specifics of the case involving their trade secrets be made public. This is because the IDD is a legal provision that prohibits a departing employee from

working for the firm's competitors for a set amount of time if doing so could hurt the previous business by disclosing trade secrets. Marx et al. (2015) show that employee mobility increases significantly in states that reject IDD compared to those that accept it. Several studies have linked the adoption of IDD to business decision-making. According to Bai et al. (2020), implementing IDD reduces capital expenditures and sales growth. According to Klasa et al. (2018), using IDD improves book and market leverage ratios. Ali et al. (2019) discover that due to the limited outside options experienced by top executives and valuable employees as a result of the adoption of IDD, they are more willing to conceal important information that may affect their ability to retain their jobs and financial incentives, reducing corporate disclosure, particularly bad news. Canil et al. (2022) found that firms in states implementing IDD pay higher dividends. According to Li et al. (2022), the implementation of IDD raises the cost of job loss, boosting their motive to avoid taxes in order to improve their present employer's judgment of their talents, achievements, and abilities. Similarly, Ding et al. (2021) show that the use of IDD increases the benefits of nondisclosure of information due to a reduction in information transparency, encouraging corporations to pursue more aggressive tax evasion methods. Colak and Korkeamäki (2021) show that firms in states with IDD take less risk because career concerns diminish CEOs' appetite for risk, resulting in conservative corporate policies. According to Chowdhury and Doukas (2022), firms in states that have implemented IDD have greater cash holdings values. Finally, Chen et al. (2021) show that states that implement IDD have a significantly higher level of acquisition activities and human capital-driven acquisition than those that reject it.

2.2. Nexus between IDD and access to external finance

Access to external finance is the second dimension of this study. As a pioneering work, Harris and Raviv (1991) highlighted firm characteristics such as age, size, profitability, collateral, and risk as important predictors of firms' access to external finance. Literature have documented some other determinants of firms' access to external finance, such as information asymmetry and other market frictions (Galanti et al., 2022; Luo et al., 2022; Paravisini, 2008; Tang, 2009), institutional environment (Demirgüç-Kunt & Maksimovic, 1999), epidemic disease (An et al., 2022), the degree of development of legal environment that related to financial system (La Porta et al., 1997; Demirgüç-Kunt & Maksimovic, 2002; Liu et al., 2022), changes in credit supply (Gilje, 2019; Santos & Cincera, 2022), barriers to entry (Cetorelli & Strahan, 2006), cognitive financial constraints (Du & Nguyen, 2022), and cross-country coordination of policy initiatives (Bose et al., 2019). According to Kashyap et al. (1993), and Jackson and Madison (2022), monetary policy is an important factor influencing firms' access to external credit. A stricter monetary policy or a reduction in credit supply may cause firms to expand their issuance of commercial paper at the expense of bank loans. Bougheas et al. (2006) demonstrate that both business characteristics and monetary policy influence firms' access to external credit. Specifically, company characteristics such as debt, risk, and size may only tighten credit constraints as interest rates rise. Shin and Park (1999) give empirical evidence that being a member of a business group or conglomerate removes financial limitations, allowing firms to obtain external financing easily.

Given that the firms' knowledge base and intellectual properties are stored in the capabilities and experience of the firms' team, these collective capabilities are what leverage innovation, shape corporate image, drive value creation, and acquire firms' sustainable competitive advantage (Coff & Raffee, 2015; Huynh et al., 2024). This is consistent with Mina et al. (2013), who show that human capital intensity has a significant impact on firms' access to external finance because the capital market interacts positively with innovation signals in particular (e.g., patents and copyrights), as well as firm quality in general. As a result, investors and financial institutions (i.e., banks) are eager to invest in highly innovative firms. We propose that firms in states that implement IDD are better able to retain valuable personnel, human capital, and, as a result, the value of their intangible assets. This is likely to improve these firms' access to external financing.

In contrast to the above theory, there are rational grounds to believe that firms in IDD-adopting states may have difficulty securing external financing. From the standpoint of trade secret protection, states that implement IDD intend to improve the protection of trade secrets for firms located in the states by reducing the danger that departing employees may engage in knowledge spillover activities by leaking a firm's trade secrets to its competitors. However, because to the limited outside options available to senior executives and valuable employees of firms in states implementing the IDD, they are more motivated to conceal crucial information that may jeopardize their ability to retain their jobs and financial benefits. This provides considerable incentives for these companies to restrict corporate disclosure (Ali et al., 2019). This raises information asymmetry, moral hazards, and adverse-selection components of the cost of capital since external investors may demand an additional premium, making external finance more expensive than internal finance (Guariglia, 2008; Whited, 2006). Furthermore, this creates a significant agency problem because managers have informational advantages over external investors (Botosan, 1997). This suggests that firms in governments that implement IDD may be more financially constrained.

In light of the above contrastive scenarios regarding the relationship between IDD and access to external finance, we propose two alternative hypotheses below.

H1a. Ceteris paribus, firms in states adopting IDD get better access to external finance as compared to those in non-IDD states.

H1b. Ceteris paribus, firms in states adopting IDD get worse access to external finance as compared to those in non-IDD states.

3. Data and methodology

3.1. Data and sample

Our sample comprises all constituents of the S&P 500 from 2005 to 2020. Following the literature review, we obtained firm

headquarters locations from 10-K filings rather than using Compustat to construct time-varying firms' locations because Compustat provides the current location of a firm's headquarters only. We also exclude financial institutions (SIC codes 6000–6999) because they are subject to different regulations and accounting principles. This returns a final sample of 390 unique companies and 7799 firm-year observations; 4948 firm-year observations represent firms in states rejecting the IDD, and 2851 firm-year observations represent firms in states adopting the IDD. Legal cases and states where courts adopt or reject the inevitable disclosure doctrine (IDD), as well as the precedent-setting that became case law, are presented in Table 1.

3.2. Model specification

Following Klasa et al. (2018), Flammer and Kacperczyk (2019), and Canil et al. (2022), we employ the difference-in-differences methodology, where firms in states adopting the IDD are the treatment group while those in states rejecting the IDD are the control group. The high-dimensional fixed effects of Gormley and Matsa (2014) with clustered standard errors at the state level to account for serial correlation within states are employed. We cluster the standard errors at the state level because the independent variable is a state-level variable. Therefore, our specification can be stated as follows:

$$STF_{i,t} \text{ or } LTF_{i,t} = \beta_0 + \beta_1 IDD_adoption_{i,t} + \beta_2 CONTROLS_{i,t} + \beta_3 FirmFE + \beta_4 Industry_i \times Year_t + \varepsilon_{i,t} \quad (1)$$

where $STF_{i,t}$ and $LTF_{i,t}$ are the dependent variables. $STF_{i,t}$ denotes access to short-term finance and is computed as the ratio of short-term debt to total debt. $LTF_{i,t}$ denotes access to long-term debt as a source of long-term finance and is computed as the ratio of long-term debt to total assets.¹ $IDD_adoption_{i,t}$ is a dummy variable that takes the value of one if the firms' headquarters are located in a state that adopted IDD by year t and zero otherwise. Table 2 provides brief definitions of these variables.

Several firm characteristics and macroeconomic variables that may impact the firms' choice of external finance are employed as control variables and are included in the abovementioned model, including size, liquidity, leverage, expansion, firm operating cycle, cash flow, GDP growth, balance trade, firm fixed effects, and industry-year fixed effects. Size is measured as the natural logarithm of annual market capitalization. Previous literature demonstrates that large companies tend to have better access to external finance because they experience fewer financial constraints relative to small companies (Almeida et al., 2016; Bougheas et al., 2006). Corporate liquidity is measured as the ratio of current assets to current liabilities. Previous literature documents conflicting findings on the relationship between corporate liquidity and access to external finance. It demonstrates that corporate liquidity affects firms' access to external finance because it may either motivate firms to have higher debts due to their greater capabilities of meeting short-term financial obligations or decrease their reliance on debt because they have sufficient cash to meet obligations and finance future investment opportunities (Ozkan, 2001). Leverage is measured as the ratio of total debt to shareholders' equity. Previous literature demonstrates that higher-leveraged companies increase their uptake of long-term debt and reduce their uptake of short-term debts (Bougheas et al., 2006; Mizen & Tsoukas, 2014). The expansion rate is measured as the ratio of investments to total assets. Previous literature demonstrates that firms with higher growth opportunities prefer long-term financing more than those with lower growth opportunities (Mizen & Tsoukas, 2012, 2014). The firm's operating cycle is measured as the ratio of net sales to net fixed assets. Previous literature demonstrates that firms with a higher operating cycle depend more on short-term debts compared to those with a lower operating cycle (Demirgüç-Kunt & Maksimovic, 1999). Cash flow is measured as the ratio of earnings before interest and taxes to total assets. Our measure of cash flow is consistent with Wald (1999) and Kim and Sorensen (1986). Previous literature demonstrates that firms with higher cash flows, as a measure for firm performance, tend to decrease financial leverage (Almeida & Campello, 2010). Both GDP growth and the ratio of balance trade to GDP are added to control for macroeconomic conditions such as economic development. Previous literature demonstrates that better economic circumstances may motivate firms to reduce their reliance on debt financing (Bougheas et al., 2006). Finally, we adopted the high-dimensional fixed effects technique of Gormley and Matsa (2014), which adds firm fixed effects and industry-year fixed effects to the model to control for both unobserved firm-specific characteristics and time-varying heterogeneity across industries, such as industry-level shocks to demand.

4. Empirical results

4.1. Descriptive statistics

Table 3 presents the descriptive statistics of the dependent, independent, and control variables. The IDD adoption is a dummy variable that takes the value of one if the firm's headquarters are in a state that adopted IDD by year t and zero otherwise. We observe that 36.5 % of the sample firms are located in states adopting the IDD, with a standard deviation of 0.481. The short-term debt (STF) is the ratio of short-term debt to total debt. The sample mean of short-term debt (STF) is 79.7 %, with a standard deviation of 0.838. The long-term debt (LTF) is the ratio of long-term debt to total assets. The sample mean of long-term debt (LTF) is 28.4 %, with a standard deviation of 0.540.

Table 4 presents the correlation coefficients between dependent, independent, and control variables. We observe that almost all correlation coefficients between the explanatory variables are less than 0.48. Alm and Mason (2008) demonstrate that as long as the correlation is less than 0.70, we should not expect any issues with multicollinearity.

¹ We follow Bose et al. (2019) in measuring the short-term and long-term components of external finance.

Table 1

Legal cases of precedent-setting adopting or rejecting the inevitable disclosure doctrine (IDD).

State	Precedent-setting case(s)	Date	Decision
AR	Southwestern Energy Co. v. Eickenhorst, 955 F. Supp. 1078 (W.D. Ark. 1997)	March 18, 1997	Adopt
	Cellco Partnership v Langston, No. 4:09CV00928JMM (W.D. Ark. 2009)	December 11, 2009	Reject
CA	Whyte v Schlage Lock Co., 101 Cal. App. 4th 1443 (2002)	September 12, 2002	Reject
CT	Branson Ultrasonics Corp. v. Stratman, 921 F. Supp. 909 (D. Conn. 1996)	February 28, 1996	Adopt
DE	E.I. duPont de Nemours & Co. v. American Potash & Chem. Corp., 200 A.2 d 428 (Del. Ch. 1964)	May 5, 1964	Adopt
FL	Fountain v. Hudson Cush-N-Foam Corp., 122 So. 2 d 232 (Fla. Dist. Ct. App. 1960)	July 11, 1960	Adopt
	Del Monte Fresh Produce Co. v. Dole Food Co. Inc., 148 F. Supp. 2 d 1326 (S.D. Fla. 2001)	May 21, 2001	Reject
GA	Essex Group Inc. v. Southwire Co., 501 S.E.2 d 501 (Ga. 1998)	June 29, 1998	Adopt
	Holton v. Physician Oncology Servs., LP. No. S13A0012, 2013WL 1859294 (Ga. 2013)	May 20, 2013	Reject
IL	Teradyne Inc. v. Clear Communications Corp., 707 F. Supp. 353 (N.D. 111. 1989)	February 9, 1989	Adopt
IN	Ackerman v. Kimball Int'l Inc., 652 N.E.2 d 507 (Ind. 1995)	July 12, 1995	Adopt
IA	Uncle B's Bakery v. O'Rourke, 920 F. Supp. 1405 (N.D. Iowa 1996)	April 1, 1996	Adopt
KS	Bradbury Co. v. Teissier-duCros, 413 F. Supp. 2 d 1203 (D. Kans. 2006)	February 2, 2006	Adopt
MA	Bard v. Intoccia, 1994 U.S. Dist. LEXIS 15,368 (D. Mass. 1994)	October 13, 1994	Adopt
	US Elec. Servs. V. Schmidt, Civil Action No. 12-10845-DJC (U.S. Dist. CT. for the Dist. of Mass. 2012)	May 14, 2012	Reject
MD	LeJeune v. Coin Acceptors, Inc., 381 Md. 288 (Md. 2004)	May 13, 2004	Reject
MI	Allis-ChalmersManuf. Co. v. Continental Aviation & Eng. Corp., 255 F. Supp. 645 (E.D.Mich. 1966)	February 17, 1966	Adopt
	CMI Int'l, Inc. v. Internet Int'l Corp., 649 N.W.2 d 808 (Mich. Ct. App. 2002)	April 30, 2002	Reject
MN	Surgidev Corp. v. Eye Technology Inc., 648 F. Supp. 661 (D.Minn. 1986)	October 10, 1986	Adopt
MO	H&R Block Eastern Tax Servs. Inc. v. Enchura, 122 F. Supp. 2 d 1067 (W.D. Mo. 20 0 0)	November 2, 2002	Adopt
NC	Travenol Laboratories Inc. v. Turner, 228 S.E.2 d 478 (N.C. Ct. App. 1976)	June 17, 1976	Adopt
	RCR Enterprises, LLC v. McCall, 2014 WL 7591977 (N.C. Super Ct. Dec. 19, 2014)	October 2, 2014	Reject
NH	Allot Communications v. Cullen, 10-E-0016 (N.H.Merrimack Superior Ct. 2010)	September 1, 2010	Reject
NJ	Nat'l Starch & Chem. Corp. v. Parker Chem. Corp., 530 A.2 d 31 (N.J. Super. Ct. 1987)	April 27, 1987	Adopt
	SCS HealthcareMarketing, LLC v. Allergan USA, Inc N.J. Super. Unpub. LEXIS 2704 (N.J. Sup. Ct. Ch. Div. 2012)		
NY	Eastman Kodak Co. v. Powers Film Prod., 189 A.D. 556 (N.Y.A.D. 1919)	December 5, 1919	Adopt
	American Airlines, Inc. v. Imhoff, U.S. Dist. LEXIS 46750 (S.D.N.Y. 2009)	June 3, 2009	Reject
OH	Procter & Gamble Co. v. Stoneham, 747 N.E.2 d 268 (Ohio Ct. App. 2000)	September 29, 2000	Adopt
	Hydrofarm Inc v. Orendorff, Ohio App. LEXIS 5717 (Ohio App Ct. 2008)	December 23, 2008	Reject
PA	Air Products & Chemical Inc. v. Johnson, 442 A.2 d 1114 (Pa. Super. Ct. 1982)	February 19, 1982	Adopt
TX	Rugen v. Interactive Business Systems Inc., 864 S.W.2 d 548 (Tex. App. 1993)	May 28, 1993	Adopt
	Cardinal Health Staffing Network Inc. v. Bowen, 106 S.W.3 d 230 (Tex. App. 2003)	April 3, 2003	Reject
UT	Novell Inc. v. Timpanogos Research Group Inc., 46 U.S.P.Q.2 d 1197 (Utah D.C. 1998)	January 30, 1998	Adopt
V.A.	Government Technology Services Inc. v. Intellisys Technology Corp. 51Va.Cir. 55 (Va. Cir. Ct. 1999)	July 23, 1999	Reject
WA	Solutech Corp. Inc. v. Agnew, 88Wash. App. 1067 (Wash. Ct. App. 1997)	December 30, 1997	Adopt
	Amazon.com Inc v. Powers, Case No. C12-1911RAJ (W.D.Wash. 2012)	December 27, 2012	Reject
WI	WI Clorox Co. v. SC Johnson & Son Inc., 2:09-cv-00408-JPS (U.S. District Court, Eastern District of Wisconsin 2009)	April 29, 2009	Reject

Note: This table lists the legal cases of precedent-setting in state adopting IDD or rejecting it after adopting it. The states that do not exist in the table did not consider the IDD or considered but rejected it. The decisions of the state court are available on Google scholar.

Source: Canil et al. (2022).

Table 2

Definitions of variables.

Variable	Definition
IDD adoption	A dummy variable that takes one of firms' headquarters in a state that adopted IDD by year t and zero otherwise.
STF	The short-term finance and is computed as the ratio of short-term debt to total debt.
LTF	The long-term or bond finance is computed as the ratio of long-term debt to total assets.
Size	The natural log of annual market cap.
Liquidity	The ratio of current assets to current liabilities.
Leverage	The ratio of total debt to shareholder's equity.
Expansion rate	The ratio of investments to total assets.
Firm operating cycle	The ratio of net assets to net fixed assets.
Cash flow	The ratio of earnings before interest and taxes (EBIT) to total assets.
GDP growth	The growth rate of gross domestic products (GDP).
Balance trade	The ratio of the trade balance to gross domestic product (GDP).

4.2. Baseline results

To test our research hypotheses, we run model (1) to examine the relationship between IDD adoption as a proxy for employee mobility and access to external finance, including access to short-term debt and access to long-term debt. Table 5 presents the results of the relationship between IDD adoption and access to external finance. We found a negative relationship between the adoption of IDD as an independent variable and short-term debt, with a coefficient of -0.079 ($t = -2.02$). This supports our alternative hypothesis (H_{1b}) that firms' states adopting IDD reduce corporate disclosure to protect trade secrets, which results in higher information asymmetry and

Table 3
Descriptive statistics.

Variable	Mean	Std. Dev.	Min	Max	Obs
Dependent and independent variables					
IDD adoption	0.365	0.481	0.000	1.000	6240
STF	0.797	0.838	0.009	6.000	5959
LTF	0.284	0.540	−0.639	3.679	5957
Control variables					
Size	16.360	1.335	12.737	19.521	6240
Liquidity	1.880	1.283	0.134	7.727	5925
Leverage	0.001	0.002	0.000	0.022	5881
Expansion rate	0.045	0.134	−0.369	0.601	5611
Firm operating cycle	1.949	1.298	1.000	10.139	5981
Cash flow	108.381	94.246	−221.331	387.939	5950
GDP growth	1.740	1.691	−2.800	3.900	6240
Balance trade	−3.754	1.032	−5.690	−2.710	6240

Note: The table exhibits the descriptive statistics for the dependent, independent and control variables. All variables are defined in [Table 2](#).

Table 4
Correlation matrix.

Variables	IDD	STF	LTF	Size	Liquid	Lever	Expan	FOC	CF	GDPG	BT
IDD adoption	1.000										
STF	0.007	1.000									
LTF	0.016	−0.595	1.000								
Size	−0.121	−0.162	0.044	1.000							
Liquidity	−0.018	0.701	−0.361	−0.157	1.000						
Leverage	−0.016	−0.193	0.391	−0.247	−0.086	1.000					
Expan	−0.002	−0.056	0.033	0.015	−0.036	−0.039	1.000				
FOC	−0.010	0.557	−0.327	−0.136	0.474	−0.075	−0.139	1.000			
CF	0.039	0.199	−0.040	0.191	0.095	−0.212	0.034	0.103	1.000		
GDPG	−0.046	0.013	−0.007	0.022	−0.008	−0.019	0.072	0.009	0.101	1.000	
BT	−0.233	−0.101	0.061	0.255	−0.003	−0.044	−0.047	−0.068	−0.061	−0.087	1.000

Note: The table exhibits the correlation coefficients of the dependent, independent, and control variable. STF denotes the short-term debt or the access to short-term finance. LTF denotes the long-term debt or the access to long-term finance as a source of long-term finance. Liquid denotes liquidity. Lever denotes leverage. Expan denotes expansion rate. FOC denotes firm operating cycle. CF denotes cash flows. GDPG denotes GDP growth. BT denotes balance trade. All variables are defined in [Table 2](#).

more financial constraints. This leads these firms to reduce their uptake of short-term debt. In contrast, the relationship between the adoption of IDD as an independent variable and long-term debt is positive and significant, with a coefficient of 0.346 ($t = 2.15$). This supports our first hypothesis (H_{1a}) that firms in stating adopting IDD are more likely to retain their human capital and, in turn, their knowledge base, which enables them to leverage innovation and acquire sustainable competitive advantages. This leads these firms to

Table 5
Baseline regression results.

Variables	DiD		Sys-GMM	
	STF	LTF	STF	LTF
Constant	−0.007 (−0.02)	6.905 (3.13)	0.439 (2.87)	0.122 (0.40)
IDD adoption	−0.079 (−2.02)	0.346 (2.15)	−0.021 (−2.24)	0.051 (2.47)
Size	0.025 (0.97)	−0.384 (−2.92)	−0.007 (−0.89)	−0.014 (−0.87)
Liquidity	0.254 (8.16)	0.085 (0.83)	−0.045 (−8.08)	0.125 (6.72)
Leverage	0.000 (1.35)	−0.004 (−2.92)	0.238 (3.29)	−0.168 (−2.01)
Expansion	−0.257 (−4.65)	0.407 (2.05)	0.234 (5.13)	−0.605 (−7.13)
Operating cycle	0.001 (0.44)	0.001 (0.22)	−0.031 (−4.84)	0.068 (4.16)
Cash flow	0.000 (4.47)	−0.001 (−0.67)	−0.001 (−6.93)	0.001 (4.75)
GDP Growth	0.009 (2.32)	0.018 (1.52)	−0.001 (−0.64)	−0.001 (−1.01)
Balance trade	0.043 (2.56)	0.112 (1.61)	−0.006 (−1.71)	−0.010 (−1.18)
Firm FE	Yes	Yes	No	No
Industry-year FE	Yes	Yes	No	No
R ² (%)	84.18	48.73		
F-statistics	17.15	2.03		
P-value	(0.000)	(0.033)		
Observations	5443	4032	5048	5048

Note: The table exhibits regression coefficients where the IDD adoption is the independent variable, and STF and LTF are the dependent variables. STF denotes the access to short-term finance. LTF denotes the access to long-term debt as a source of long-term finance. All variables are defined in [Table 2](#).

increase their uptake of long-term debt. Our findings are economically meaningful, as the adoption of IDD results in a 4.8 % reduction in short-term debt and a 4.7 % increase in long-term debt.

Moreover, we use dynamic panel data models to capture the dynamic behavior of corporate policies. Flannery and Hankins (2013) and Dang et al. (2015) demonstrate that the dynamic panel data model is of particular importance nowadays because corporate behavior (e.g., investment, capital structure, and dividend policy) is in reality dynamic, and consequently, we should rely on dynamic models to model it. Flannery and Hankins (2013) compare the performance of various dynamic panel data models and find that Sys-GMM estimator is the best one regardless of the level of endogeneity of the persistence of the dependent variable. Here, we rely on sys-GMM with Windmeijer (2005)'s WC-robust standard errors to examine the impact of the IDD adoption on access to external finance. The third and fourth columns of Table 5 report the related results. The impact of the IDD adoption on short-term finance is still statistically significant and negative at the 5 % level (coefficient -0.021 , $t = -2.24$), while the impact of the IDD adoption on long-term finance is still statistically significant and positive at the 5 % level (coefficient 0.051 , $t = 2.47$). These findings are consistent with the baseline regression and suggest that our results are not only robust to the dynamic behavior of corporate decisions but also are not driven by a specific estimator.

4.3. The role of firm age

In this part, we look at how company age influences the link between IDD adoption and access to external finance. Firm age is defined as the number of years since the company went public or was publicly listed on the stock exchange. We propose that **company age can act as a positive mediator of the link between IDD adoption and external financing**. This can be ascribed to numerous factors. First, organizations tend to rely on internal resources in their early years of operation, whereas they have greater access to external capital as they mature. Second, older firms have greater visibility in the eyes of finance providers, which results in lower levels of information asymmetry and less external financial limitations (Berger & Udell, 1998, 2006). Third, older organizations are better at keeping human capital and maintaining their knowledge base than younger firms, which have less expertise and are more likely to benefit from knowledge spillover (Müller & Zimmermann, 2009; Petersen & Rajan, 1995).

Table 6 shows the estimates of the moderating role of firm age derived from running model (1), which includes firm age as a moderating variable. We create a dummy variable that has a value of 1 if a firm exceeds the sample median and 0 otherwise. The results do not support our prediction that firm age can positively moderate the relationship between IDD adoption and access to external finance. The interaction term (IDD adoption \times firm age) is negative and significant at the 1 % significance level for both short-term finance (STF) and long-term finance (LTF), with coefficients of -0.177 ($t = -3.44$) and -0.822 ($t = -3.60$), respectively. This means that older firms in states implementing the IDD have less access to short- and long-term financing than younger ones. This negative moderating effect might be linked to: (i) older firms are more visible and so subject to public criticism. As a result, they are more prone to conceal information, particularly financial information, in order to prevent unhappiness and criticism from shareholders and stakeholders in general, so increasing information asymmetry and limiting their access to external finance. The implementation of IDD limits CEOs' outside alternatives, as they cannot move to their primary competitors if they quit their current positions. This causes CEOs to seek conservative business policies to protect their existing positions, particularly those who lead older, well-established firms, and to avoid risky corporate strategies such as relying on external sources of financing.

4.4. The role of CEO age

In this part, we look at how CEO age influences the relationship between IDD adoption and access to external financing. CEO age is defined as the age of a firm's CEO. According to Hambrick and Mason's upper echelon theory (1984), a CEO's personal attributes (e.g., age, gender, tenure, background, and experience) influence his perception and interpretation of the situation, which in turn influences business strategies, policies, success, and results. We hypothesize that **CEO age can have a negative impact on the link between IDD**

Table 6
The role of firm age.

Variables	STF	LTF
Constant	-0.378 (-0.88)	-8.947 (-2.81)
IDD adoption	0.062 (1.20)	0.721 (2.98)
Firm age	0.045 (1.16)	-0.026 (-0.25)
IDD adoption \times Firm age	-0.177 (-3.49)	-0.822 (-3.60)
Control variables	Yes	Yes
Firm FE	Yes	Yes
Industry-year FE	Yes	Yes
R ² (%)	87.83	73.64
F-statistics	17.76	2.12
P-value	(0.000)	(0.000)
Observations	4032	5443

Note: The table exhibits regression coefficients for firms where firm age is a moderating variable. The IDD adoption is the independent variable, and STF and LTF are the dependent variables. STF denotes access to short-term finance. LTF denotes the access to long-term debt as a source of long-term finance. All variables are defined in Table 2.

adoption and access to external financing. Firms in states that implement the IDD and have younger CEOs may have greater access to external capital. There are various grounds for this prediction. First, as elder CEOs gain business and life experience, their level of loss aversion increases, reducing their willingness to use external sources of money (Serfling, 2014; Vos et al., 2009). Second, younger CEOs are more likely to make strategic changes, which increases the risk of undermining the firm's capital structure (Finkelstein & Hambrick, 1996). Third, younger CEOs are more likely to have growth objectives and prefer aggressive policies and initiatives (Belenzon et al., 2019). According to Benedsen et al. (2020), younger CEOs are less likely to experience negative health outcomes.

Table 7 shows the estimates of the moderating role of CEO age obtained by running model (1) with CEO age as a moderating variable. We create a dummy variable that has a value of 1 if a CEO's age exceeds the sample median and 0 otherwise. The results contradict our prediction since the interaction term (IDD adoption \times CEO age) is positive and significant at the 10 % significance level for STF (0.055 with a t-value of 1.70), but positive and insignificant for LTF (0.978 with a t-value of 0.88). This suggests that firms in states that have adopted the IDD and have older CEOs have easier access to short-term finance, yet there is no significant difference in access to long-term finance between firms with older CEOs and those with younger ones. For short-term finance, the positive moderating influence of CEO age can be related to the fact that older CEOs have a longer track record, resulting in less doubt about their quality and hence easier access to short-term finance. As a result, firms with elder CEOs in states implementing the IDD are better equipped to absorb short-term debt.

4.5. The role of CEO gender

In this part, we look at how CEO gender influences the relationship between IDD adoption and access to external financing. We define the CEO's gender as a dummy variable that equals one if the CEO is male and zero otherwise. This section builds on previous studies into gender-based discrimination in external financing (Chaudhuri et al., 2020; Verheul & Thurik, 2001). We anticipate that **firm-led female CEOs in states implementing the IDD have more difficult and limited access to external capital.** There are various reasons why companies led by women have less access. First, applications from female-led firms are more likely to be rejected by the credit market, and they may pay higher interest rates on their short-term finance due to cultural difficulties (for example, gender discrimination, and some lenders believe women are more likely to default). Second, females in general have poorer credit histories and, as a result, lower credit scores because most contracts for financial and non-financial responsibilities, utilities, and other connected services are in their husbands' names (Mertzanis et al., 2023). Firm-led females may face greater financial constraints due to institutional factors such as their lack of participation in the formal market economy and their emphasis on household activities (Aterido et al., 2013). Females are more risk averse than males. Males have a higher risk tolerance than females, who are more passionate, emotional, collegial, and sensitive (Orser et al., 2006).

Table 8 displays the estimates of the moderating role of CEO gender derived from running model (1), in which CEO gender is a moderator. Unfortunately, the findings support our assumption regarding access to short-term finance only because the relevant interaction term (IDD adoption \times CEO gender) is positive and significant at the 5 % significance level (0.169, t-value = 2.36). This means that firms managed by male CEOs in governments implementing the IDD have easier access to short-term financing, which aids their task of growing their use of short-term debt. The results for access to long-term finance contradict our expectations, as the relevant interaction term (IDD adoption \times CEO gender) is negative and significant at the 1 % level (−0.044 with a t-value of −2.70). This negative moderating effect of CEO gender on the relationship between IDD adoption and access to long-term external finance can be attributed to the higher performance and stronger political connections that firms led by female CEOs have (Sun & Zou, 2021), which makes access to less costly and long-term debt easier than that led by male CEOs.

4.6. The role of CEO-holding MBA

In this part, we look at how the **CEO-holding MBA moderates the relationship between IDD adoption and access to external**

Table 7
The role of CEO age.

Variables	STF	LTF
Constant	−0.257 (−0.54)	−1.629 (−0.52)
IDD adoption	−0.050 (−1.21)	0.141 (0.63)
CEO age	−0.050 (−2.46)	0.197 (1.23)
IDD adoption \times CEO age	0.055 (1.70)	0.397 (0.88)
Control variables	Yes	Yes
Firm FE	Yes	Yes
Industry-year FE	Yes	Yes
R ² (%)	90.72	51.54
F-statistics	18.80	1.76
P-value	(0.000)	(0.061)
Observations	4032	4032

Note: The table exhibits regression coefficients for firms where CEO age is a moderating variable. The IDD adoption is the independent variable, and STF and LTF are the dependent variables. STF denotes access to short-term finance. LTF denotes the access to long-term debt as a source of long-term finance. All variables are defined in Table 2.

Table 8
The role of CEO gender.

Variables	STF	LTF
Constant	0.188 (0.45)	0.454 (4.25)
IDD adoption	−0.242 (−3.03)	0.056 (3.33)
CEO gender	−0.120 (−2.02)	−0.030 (−2.47)
IDD adoption × CEO gender	0.169 (2.36)	−0.044 (−2.70)
Control variables	Yes	Yes
Firm FE	Yes	Yes
Industry-year FE	Yes	Yes
R ² (%)	83.69	88.65
F-statistics	13.47	96.20
P-value	(0.000)	(0.000)
Observations	5443	5443

Note: The table exhibits regression coefficients for firms where CEO gender is a moderating variable. The IDD adoption is the independent variable, and STF and LTF are the dependent variables. STF denotes access to short-term finance. LTF denotes the access to long-term debt as a source of long-term finance. All variables are defined in Table 2.

capital. We define the CEO-holding MBA as a dummy variable that returns one if the CEO has an MBA and zero otherwise. We hypothesize that firms with MBA CEOs in states implementing the IDD have less access to external financing. In other words, we predict CEOs with MBAs to have a negative influence on the connection between IDD adoption and access to external financing. For numerous reasons, this link is likely to be weaker for firms with MBA CEOs. First, there is ample evidence in the literature that MBA CEOs are more risk-averse because MBA programs tend to attract more risk-averse individuals because those individuals learn analytical skills that lead to a reduction in losses and managerial mistakes, implying that MBA degrees are presumed to be unconcerned about risk-taking skills and innovation (Finkelstein & Hambrick, 1996). Second, MBA programs do not give adequate training, therefore MBA holders lack the necessary skills, knowledge, and capabilities to handle complicated evaluations and judgments related with risky proposals (MacLagan, 2008). As a result, they are less inclined to seek external financing.

Table 9 displays the estimates of MBA CEOs' moderating role generated by running model (1), where the CEO-holding MBA is a moderating variable. The findings support our prediction that firms led by MBA holders in states adopting the IDD have limited access to external finance for long-term finance. The interaction term (IDD adoption × MBA CEO) is negative and significant at the 5 % level (−0.568 with a t-value of −2.52). This means that firms led by MBA holders in states implementing the IDD have more difficult access to long-term finance, limiting their ability to raise their long-term finance uptake when compared to those managed by non-MBAs. CEO-holding MBAs positively modify the association between IDD adoption and access to external funding. The interaction term (IDD adoption × MBA CEO) is positive and significant at the 5 % level (0.079 with a t-value of 2.31). This means that firms led by MBA holders in states implementing the IDD have greater access to short-term finance, allowing them to increase their use of short-term finance as compared to those led by non-MBA holders. This finding is consistent with Miller and Xu's (2019) emphasis on the short-termism of CEOs with MBAs.

4.7. Endogeneity issues

This section discusses potential endogeneity concerns that may influence the relationship between IDD adoption and availability to external finance. We began by adding year, industry, and state fixed effects to the baseline regression model to control time-invariant unobservable characteristics within each year, industry, and state. Second, we investigated reverse causality as a possible cause of

Table 9
The role of CEO-holding MBA.

Variables	STF	LTF
Constant	0.068 (0.21)	−8.084 (−3.29)
IDD adoption	−0.078 (−2.52)	0.470 (3.41)
MBA CEO	−0.017 (−0.75)	−0.361 (−2.28)
IDD adoption × MBA CEO	0.079 (2.31)	−0.568 (−2.52)
Control variables	Yes	Yes
Firm FE	Yes	Yes
Industry-year FE	Yes	Yes
R ² (%)	86.36	73.54
F-statistics	25.96	7.70
P-value	(0.000)	(0.000)
Observations	5443	5443

Note: The table exhibits regression coefficients for firms where CEO-holding MBA is a moderating variable. The IDD adoption is the independent variable, and STF and LTF are the dependent variables. STF denotes access to short-term finance. LTF denotes the access to long-term debt as a source of long-term finance. All variables are defined in Table 2.

endogeneity. To address this issue, we used the 2SLS approach. Following previous research, we calculate an industry-year average of IDD adoption to serve as an instrumental variable (Benlemlih & Bitar, 2018; El Ghoul et al., 2011; Habib & Hasan, 2017). We take this approach because this instrument is exogenous, which means that the locations of firms (in or out of states that use the IDD) are determined not only by their own actions and behaviors, but also by the actions and behaviors of their key competitors (Comyns & Franklin-Johnson, 2018). Thus, the industry-year average adoption of IDD may influence firms' decisions to locate within or outside states that have adopted IDD, which is our endogenous variable, but it is unlikely to influence firm-level access to external finance. Table 10 shows the estimates of 2SLS estimators for short-term and long-term external finance. Columns (1) and (3) of Table 10 show the first stage regression, which demonstrates the correctness of our instrumental variable because the endogenous variable, adoption of IDD, is strongly and significantly related to the chosen instrumental variable (0.978 with a t-value of 156.58) for both short-term and long-term levels of external finance. Furthermore, the first step of regression supports the validity of the instrumental variable, as the under-identification test of the Kleibergen-Paap rk LM statistic is significant at 1 % (P-value < 1 %). The Cragg-Donald Wald F-statistic's weak instrument test likewise supports the validity of our instrumental variable, with statistics of 12380.57, which is significantly higher than Stock and Yogo's (2005) critical value of 16.38. Columns (2) and (4) of Table 10 show the 2SLS regression estimates for short-term and long-term external funding. The findings are consistent with the baseline regression in terms of the negative and significant relationship between IDD adoption and short-term finance at the 1 % significance level (-0.067 with a t-value of -494) and the positive and significant relationship between IDD adoption and long-term finance at the 1 % significance level (0.026 with a t-value of 3.39). This suggests that these correlations remain unchanged even after accounting for reverse causality, putting to rest any concerns regarding reverse causality as a potential cause of endogeneity.

Third, we employ Rosenbaum and Rubin's (1983) propensity score matching to address concerns about omitted variables as a potential source of endogeneity. Firms in states that implement the IDD are designated as the treatment group, while those in states that reject the IDD are designated as the control group. Table 11 shows the results of the propensity score matching. We find that firms in states that implement the IDD have a mean ratio of 0.779 and 0.304 for short-term and long-term debt, respectively, whereas those in states that reject the IDD have a mean ratio of 0.840 and 0.246 for short-term and long-term debt. Significant differences between them are -0.061 ($t = -2.06$) and 0.059 ($t = 2.65$). These findings also lend support to the baseline results, implying that the negative relationship between IDD adoption and short-term finance and the positive relationship between IDD adoption and long-term debt are not driven by unobserved variables, easing concerns about this potential source of endogeneity.

These findings build on the previous work of Klasa et al. (2018) and Ee et al. (2023), who focus on capital structure and debt maturity by investigating the relationship between IDD adoption and debt composition or the firm's external finance composition. Klasa et al. (2018) discover that firms in states that do not implement the IDD tend to follow conservative capital structure policies due to competitive concerns posed by the potential migration of valuable personnel and, as a result, the potential loss of trade secrets. Ee et al. (2023) show that employee limits cause firms to prioritize debts with shorter maturities due to knowledge asymmetries. Our findings complement these findings by demonstrating that firms in states that adopt the IDD take less short-term debt and more long-term debt than those in states that reject the IDD, whereas those in states that do not adopt the IDD tend to behave in the opposite way.

5. Conclusion

In this work, we investigate the relationship between the adoption of IDD, which protects trade secrets, reduces information spillover to competitors, and limits important employees' outside options, and a company's access to external financing. The aim of this paper is important for several reasons: first, the composition of capital structure (short-term and long-term) is an important decision and reflects to some extent not only the quality of the balance sheet but also the quality of firms' financial health (Bose et al., 2019). Second, access to external finance is a key determinant of firm performance, growth, and investment behavior (Knyazeva et al., 2009). Third, access to finance enhances productivity and, in turn, economic growth (Butler & Cornaggia, 2011). Fourth, debt can serve as a disciplining device to discipline corporate managers to restrict agency conflicts by reducing the cash flow held by corporate managers to entrench their managerial discretion and engage in self-interest behavior such as empire building and expense preference behavior (Liao et al., 2015).

In order to accomplish the aim of this paper, a sample of all non-financial companies listed on the S&P 500 from 2005 to 2020 is used. Using a difference-in-difference estimation method, we find that firms in states that embrace the IDD tend to accept less short-term debt and more long-term debt than those in states that reject the IDD. For short-term finance, our extended analyses show that company age has a negative moderating effect on the connection between IDD adoption and access to external finance, but CEO age, gender, and MBA-holding status have a positive moderating effect. For long-term financing, our extended analyses show that company age, CEO gender, and MBA-holding CEOs all negatively influence the association between IDD adoption and access to external funding, although CEO age has no effect on this relationship.

These findings have important practical implications for state governments, which shape state laws. They should be cognizant of the ramifications of state courts implementing IDD, which restricts the firm's access to short-term finance while facilitating access to long-term debt. To avoid the projected negative impact on access to short-term funding, boards of directors and shareholders should implement rules that encourage senior executives to improve their corporate disclosure if the firm is headquartered in a state that has adopted the IDD. In other words, increasing prized employees' mobility may reduce financial limits on short-term debt. Our findings also have important implications for industry because they highlight a critical shift in the competitive landscape in which companies rely heavily on their human capital, particularly trade secrets, as a key source of competitive advantage over their key competitors, and are therefore deeply concerned with the protection of this human capital. Furthermore, valuable personnel who represent the firm's

Table 10

Endogeneity: 2SLS estimation on the IDD adoption and external finance.

Variables	Coefficients			
	STF		LTF	
	1st stage	2nd stage	1st stage	2nd stage
Intercept	−0.161 (−2.70)	0.936 (9.69)	−0.161 (−2.70)	0.067 (1.25)
Industry organizational capital (Instrument)	0.978 (156.58)		0.978 (156.58)	
INV (Dependent)		−0.067 (−4.94)		0.026 (3.39)
Control variables	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes
Observations	5453	5453	5453	5453
<u>Under-identification test:</u>				
Kleibergen-Paap rk LM statistic	2482.30		2482.30	
P-Value	(0.000)		(0.000)	
<u>Weak identification test:</u>				
Cragg-Donald Wald F statistic	12380.57		12380.57	
Stock-Yogo (2005) critical value (10 % maximal IV size)	16.38		16.38	
Hansen J-statistics	Exactly identified		Exactly identified	
P-Value	(0.000)		(0.000)	

Note: This table exhibits the 2SLS estimates. The IDD adoption is the independent variable, and STF and LTF are the dependent variables. STF denotes access to short-term finance. LTF denotes the access to long-term debt as a source of long-term finance. Following the literature, we use the industry (2-digit SIC code) average of the independent variable as instrumental variable. Figures in parentheses are t-statistics. Standard errors are clustered at the firm level for heteroscedasticity. All variables are defined in [Table 2](#).

Table 11

Endogeneity: Using propensity score matching.

	No. of observations	Mean	Difference	P-Value of differences
STF				
Firms in states adopting IDD	1724	0.779	−0.061 (−2.06)	(0.040)
Firms in states rejecting IDD	3729	0.840		
LTF				
Firms in states adopting IDD	1724	0.304	0.059 (2.65)	(0.008)
Firms in states rejecting IDD	3729	0.246		

Note: The table exhibits the propensity score matching estimates that were used to test differences between the treated group and the control group. The treated group consists of firms in states adopting IDD, while the control group consists of firms in states rejecting IDD. The variables are defined in [Table 2](#).

knowledge base are more likely to depart since competitors are eager to pay them to acquire access to trade secrets. The changes in the competitive landscape have a significant impact on financial policies. Our findings show that competitive threats in states that do not implement the IDD limit their access to long-term finance, causing firms in these states to lower their use of long-term finance. However, boards of directors and shareholders of companies headquartered in states that reject the IDD should improve their innovation signals to outsiders to mitigate the projected negative effects of rejecting the IDD on access to long-term funding. In other words, limiting the value of an employee's mobility may improve access to long-term financing by allowing businesses to retain their workforce. Similarly, if the firm operates in a state that has adopted the IDD, it should establish and implement plans, including financial incentives, that allow it to retain valuable personnel, maintain its innovative skills, and overcome labor market frictions.

Finally, future research can look into the relationship between IDD adoption and other corporate policies such as investment policies (e.g., R&D and capital expenditures), corporate diversification, disclosure of cyber security risk, earnings and dividend smoothing, hedging, and corporate social responsibility (CSR).

Ethics approval and consent to participate

Not applicable.

Consent for publication

All authors are very positive to publish this manuscript on this journal.

Availability of data and materials

Our data will be available on request.

Funding

This paper was supported by the Major Program of the National Social Science Foundation of China (Grant No. 23&ZD175), the National Natural Science Foundation of China (Grant Nos. 72173096, 72303139, 71873103).

Competing interests

There is no competing interest among the authors.

Acknowledgements

We will be grateful to the anonymous reviewers who will comment on this manuscript.

Data availability

Data will be made available on request.

References

- Abowd, J. M., Haltiwanger, J., Jarmin, R., Lane, J., Lengerhmann, P., McCue, K., McKinney, K., & Sandusky, K. (2005). The relation among human capital, productivity, and market value: Building up from micro evidence. In *Measuring capital in the new economy* (pp. 153–204). University of Chicago Press.
- Ali, A., Li, N., & Zhang, W. (2019). Restrictions on managers' outside employment opportunities and asymmetric disclosure of bad versus good news. *The Accounting Review*, 94(5), 1–25.
- Alm, L., & Mason, S. G. (2008). Linear correlation and regression. In K. Yang, & G. J. Miller (Eds.), *Handbook of research methods in public administration* (pp. 427–453). Boca Raton: Taylor & Francis Group, LLC.
- Almeida, H., & Campello, M. (2010). Financing frictions and the substitution between internal and external funds. *Journal of Financial and Quantitative Analysis*, 45(3), 589–622.
- Almeida, H., Cunha, I., Ferreira, M. A., & Restrepo, F. (2016). The real effects of credit ratings: The sovereign ceiling channel. *Journal of Finance (New York)*, 72(1), 249–290.
- An, J., Hou, W., & Lin, C. (2022). Epidemic disease and financial development. *Journal of Financial Economics*, 143(1), 332–358.
- Aobdia, D. (2018). Employee mobility, noncompete agreements, product-market competition, and company disclosure. *Review of Accounting Studies*, 23, 296–346.
- Aterido, R., Beck, T., & Iacovone, L. (2013). Access to finance in sub-saharan africa: Is there a gender gap? *World Development*, 47(July), 102–120.
- Ayyagari, M., Juarros, P., Peria, M. S., & Singh, S. (2021). Access to finance and job growth: Firm-level evidence across developing countries. *Review of Finance*, 25(5), 1473–1496.
- Bai, J., Fairhurst, D., & Serfling, M. (2020). Employment protection, investment, and firm growth. *Review of Financial Studies*, 33(2), 644–688.
- Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy*, 70(5), 9–49.
- Belenzon, S., Shamshur, A., & Zarutskie, R. (2019). CEO's age and the performance of closely held firms. *Strategic Management Journal*, 40(6), 917–944.
- Benlemlih, M., & Bitar, M. (2018). Corporate social responsibility and investment efficiency. *Journal of Business Ethics*, 148, 647–671.
- Berger, A. N., & Udell, G. F. (1998). The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle. *Journal of Banking & Finance*, 22(6–8), 613–673.
- Berger, A. N., & Udell, G. F. (2006). A more complete conceptual framework for SME finance. *Journal of Banking & Finance*, 30(11), 2945–2966.
- Bertrand, M., & Schoar, A. (2003). Managing with style: The effect of managers on firm policies. *Quarterly Journal of Economics*, 118(4), 1169–1208.
- Bishara, N., Martin, K. J., & Thomas, R. S. (2015). When do CEOs have covenants not to compete in their employment contracts? *Vanderbilt Law Review*, 68(1), 12–33.
- Bose, U., MacDonald, R., & Tsoukas, S. (2019). Policy initiatives and firms' access to external finance: Evidence from a panel of emerging Asian economies. *Journal of Corporate Finance*, 59(December), 162–184.
- Botosan, C. A. (1997). Disclosure level and the cost of equity capital. *The Accounting Review*, 72(3), 323–349.
- Bougheas, S., Mizen, P., & Yalcin, C. (2006). Access to external finance: Theory and evidence on the impact of monetary policy and firm-specific characteristics. *Journal of Banking & Finance*, 30(1), 199–227.
- Butler, A. W., & Cornaggia, J. (2011). Does access to external finance improve productivity? Evidence from a natural experiment. *Journal of Financial Economics*, 99(1), 184–203.
- Canil, J., Karpavicius, S., & Yu, C.-F. (2022). CEO mobility and corporate payouts. *Journal of Business Finance & Accounting*. <https://doi.org/10.1111/jbfa.12667>. Advance online publication.
- Cetorelli, N., & Strahan, P. E. (2006). Finance as a Barrier to Entry: Bank competition and industry structure in local U.S. markets. *Journal of Finance (New York)*, 61(1), 437–461.
- Chaudhuri, K., Sasidharan, S., & Raj, R. S. (2020). Gender, small firm ownership, and credit access: Some insights from India. *Small Business Economics*, 54, 1165–1181.
- Chen, D., Gao, H., & Ma, Y. (2021). Human capital-driven acquisition: Evidence from the inevitable disclosure doctrine. *Management Science*, 67(8), 4643–4664.
- Chen, M., & Matousek, R. (2020). Do productive firms get external finance? Evidence from Chinese listed manufacturing firms. *International Review of Financial Analysis*, 67(January), Article 101422.
- Chowdhury, R., & Doukas, J. A. (2022). Protection of trade secrets and value of cash holdings: Evidence from a natural experiment. *Journal of Banking & Finance*, 143 (October), Article 106617.
- Coff, R., & Raffee, J. (2015). Toward a theory of perceived firm-specific human capital. *Academy of Management Perspectives*, 29(3), 326–341.
- Colak, G., & Korkeamäki, T. (2021). CEO mobility and corporate policy risk. *Journal of Corporate Finance*, 69(August), Article 102037.
- Comyns, B., & Franklin-Johnson, E. (2018). Corporate reputation and collective crises: A theoretical development using the case of Rana plaza. *Journal of Business Ethics*, 150, 159–183.
- Custódio, C., Ferreira, M. A., & Matos, P. (2013). Generalists versus specialists: Lifetime work experience and chief executive officer pay. *Journal of Financial Economics*, 108(2), 471–492.
- Dang, V. A., Kim, M., & Shin, Y. (2015). In search of robust methods for dynamic panel data models in empirical corporate finance. *Journal of Banking & Finance*, 53 (April), 84–98.
- Demirgüç-Kunt, A., & Maksimovic, V. (1999). Institutions, financial markets, and firm debt maturity. *Journal of Financial Economics*, 54(3), 295–336.
- Demirgüç-Kunt, A., & Maksimovic, V. (2002). Funding growth in bank-based and market-based financial systems: Evidence from firm-level data. *Journal of Financial Economics*, 65(3), 337–363.
- Ding, R., Sainani, S., & Zhang, Z. (2021). Protection of trade secrets and corporate tax avoidance: Evidence from the inevitable disclosure doctrine. *Journal of Business Research*, 132(August), 221–232.

- Dittmar, A., & Duchin, R. (2016). Looking in the rear view mirror: The effect of managers' professional experience on corporate financial policy. *Review of Financial Studies*, 29(3), 565–602.
- Du, J., & Nguyen, B. (2022). Cognitive financial constraints and firm growth. *Small Business Economics*, 58, 2109–2137.
- Ee, M. S., Huang, H., & Cheng, M. (2023). Do labor mobility restrictions affect debt maturity? *Journal of Financial Stability*, 66(June), Article 101121.
- El Ghoul, S., Guedhami, O., Kwok, C. C., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance*, 35(9), 2388–2406.
- Faccio, M., Marchica, M.-T., & Mura, R. (2016). CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance*, 39, 193–209.
- Finkelstein, S., & Hambrick, D. C. (1996). *Strategic leadership: Top executives and their effects on organizations*. St Paul, Minneapolis: West publishing company.
- Flammer, C., & Kacperczyk, A. (2019). Corporate social responsibility as a defense against knowledge spillovers: Evidence from the inevitable disclosure doctrine. *Strategic Management Journal*, 40(8), 1243–1267.
- Flannery, M. J., & Hankins, K. W. (2013). Estimating dynamic panel models in corporate finance. *Journal of Corporate Finance*, 19, 1–19.
- Galanti, S., Leroy, A., & Vaubourg, A.-G. (2022). Investment and access to external finance in Europe: Does analyst coverage matter? *International Review of Financial Analysis*, 81(May), Article 102108.
- Gao, H., Zhang, H., & Zhang, J. (2018). Employee turnover likelihood and earnings management: Evidence from the inevitable disclosure doctrine. *Review of Accounting Studies*, 23, 1424–1470.
- Gilje, E. P. (2019). Does local access to finance matter? Evidence from U.S. Oil and natural gas shale booms. *Management Science*, 65(1), 1–18.
- Gormley, T. A., & Matsa, D. A. (2014). Common errors: How to (and not to) control for unobserved heterogeneity. *Review of Financial Studies*, 27(2), 617–661.
- Guariglia, A. (2008). Internal financial constraints, external financial constraints, and investment choice: Evidence from a panel of UK firms. *Journal of Banking & Finance*, 32(9), 1795–1809.
- Habib, A., & Hasan, M. M. (2017). Social capital and corporate cash holdings. *International Review of Economics & Finance*, 52, 1–20.
- Harris, M., & Raviv, A. (1991). The theory of capital structure. *Journal of Finance (New York)*, 46(1), 297–355.
- Hu, D., Lee, E., & Li, B. (2023). Trade secrets protection and stock price crash risk. *Financial Review (Buffalo, N. Y.)*, 58(2), 395–421.
- Huynh, N., Le, Q. N., & Tran, Q. T. (2024). Firm-level political risk and intellectual capital investment: Does managerial ability matter? *International Review of Financial Analysis*, 91(January), Article 103020.
- Jackson, P., & Madison, F. (2022). Entrepreneurial finance and monetary policy. *European Economic Review*, 141(January), Article 103961.
- Jeong, B. (2003). The welfare effects of mobility restrictions. *Review of Economic Dynamics*, 6(3), 685–696.
- Kashyap, A. K., Stein, J. C., & Wilcox, D. W. (1993). Monetary policy and credit conditions: Evidence from the composition of external finance. *The American Economic Review*, 83(1), 78–98.
- Kim, J., & Marschke, G. (2005). Labor mobility of scientists, technological diffusion, and the firm's patenting decision. *The RAND Journal of Economics*, 36(2), 298–317.
- Kim, W. S., & Sorensen, E. H. (1986). Evidence on the impact of the agency costs of debt on corporate debt policy. *Journal of Financial and Quantitative Analysis*, 21(2), 131–144.
- King, T., Srivastav, A., & Williams, J. (2016). What's in an education? Implications of CEO education for bank performance. *Journal of Corporate Finance*, 37, 287–308.
- Klasa, S., Ortiz-Molina, H., Serfling, M., & Srinivasan, S. (2018). Protection of trade secrets and capital structure decisions. *Journal of Financial Economics*, 128(2), 266–286.
- Knyazeva, A., Knyazeva, D., & Stiglitz, J. (2009). Ownership changes and access to external financing. *Journal of Banking & Finance*, 33(10), 1804–1816.
- Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science*, 3(3), 383–397.
- Kuzmina, O. (2023). Employment flexibility and capital structure: Evidence from a natural experiment. *Management Science*, 69(9), 4992–5017.
- Li, N., Shevlin, T., & Zhang, W. (2022). Managerial career concerns and corporate tax avoidance: Evidence from the inevitable disclosure doctrine. *Contemporary Accounting Research*, 39(1), 7–49.
- Liao, L.-K., Mukherjee, T., & Wang, W. (2015). Corporate governance and capital structure dynamics: An empirical study. *Journal of Financial Research*, 38(2), 169–192.
- Liu, Y. (2014). Outside options and CEO turnover: The network effect. *Journal of Corporate Finance*, 28(October), 201–217.
- Luo, Y., Xiong, G., & Mardani, A. (2022). Environmental information disclosure and corporate innovation: The “Inverted U-shaped” regulating effect of media attention. *Journal of Business Research*, 146(July), 453–463.
- MacLagan, P. (2008). Organizations and responsibility: A critical overview. *System Research and Behavioral Science*, 25(3), 371–381.
- Marciukaityte, D. (2015). Right-to-Work Laws and financial leverage. *Financial Management*, 44(1), 147–175.
- Marx, M., Singh, J., & Fleming, L. (2015). Regional disadvantage? Employee non-compete agreements and brain drain. *Research Policy*, 44(2), 394–404.
- Mertzanis, C., Marshdeh, H., & Ashraf, S. (2023). Female corporate leadership, institutions and financing constraints around the world. *International Journal of Managerial Finance*. <https://doi.org/10.1108/IJMF-07-2022-0340>. Advance online publication.
- Miller, D., & Xu, X. (2019). MBA CEOs, short-term management and performance. *Journal of Business Ethics*, 154, 285–300.
- Mina, A., Lahr, H., & Hughes, A. (2013). The demand and supply of external finance for innovative firms. *Industrial and Corporate Change*, 22(4), 869–901.
- Mizen, P., & Tsoukas, S. (2012). The response of the external finance premium in Asian corporate bond markets to financial characteristics, financial constraints and two financial crises. *Journal of Banking & Finance*, 36(11), 3048–3059.
- Mizen, P., & Tsoukas, S. (2014). What promotes greater use of the corporate bond market? A study of the issuance behaviour of firms in asia. *Oxford Economic Papers*, 66(1), 227–253.
- Müller, E., & Zimmermann, V. (2009). The importance of equity finance for R&D activity. *Small Business Economics*, 33(3), 303–318.
- Orser, B. J., Riding, A. L., & Manley, K. (2006). Women entrepreneurs and financial capital. *Entrepreneurship Theory and Practice*, 30(5), 643–665.
- Ozkan, A. (2001). Determinants of capital structure and adjustment to long run target: Evidence from UK company panel data. *Journal of Business Finance & Accounting*, 28(1–2), 175–198.
- Paravisini, D. (2008). Local bank financial constraints and firm access to external finance. *Journal of Finance (New York)*, 63(5), 2161–2193.
- Petersen, M. A., & Rajan, R. G. (1995). The effect of credit market competition on lending relationships. *Quarterly Journal of Economics*, 110(2), 407–443.
- Rahaman, M. M. (2011). Access to financing and firm growth. *Journal of Banking & Finance*, 35(3), 709–723.
- Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70(1), 41–55.
- Santos, A., & Cincera, M. (2022). Determinants of financing constraints. *Small Business Economics*, 58, 1427–1439.
- Serfling, M. A. (2014). CEO age and the riskiness of corporate policies. *Journal of Corporate Finance*, 25(April), 251–273.
- Serfling, M. (2016). Firing costs and capital structure decisions. *Journal of Finance (New York)*, 71(5), 2239–2285.
- Shin, H.-H., & Park, Y. S. (1999). Financing constraints and internal capital markets: Evidence from Korean 'chaebols'. *Journal of Corporate Finance*, 5(2), 169–191.
- Simintzi, E., Vig, V., & Volpin, P. (2015). Labor protection and leverage. *Review of Financial Studies*, 28(2), 561–591.
- Simsek, Z. (2007). CEO tenure and organizational performance: An intervening model. *Strategic Management Journal*, 28(6), 653–662.
- Song, J., Almeida, P., & Wu, G. (2003). Learning-by-hiring: When is mobility more likely to facilitate interfirm knowledge transfer? *Management Science*, 49(4), 351–365.
- Stannard, T., & Guthrie, G. (2021). *CEO turnover: The effect of CEOs' outside options*. Retrieved from SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3940923.
- Stock, J. H., & Yogo, M. (2005). Testing for weak instruments in linear IV regression. In D. Andrews (Ed.), *Identification and inference for econometric models* (pp. 80–108). New York: Cambridge University Press.
- Sun, R., & Zou, G. (2021). Political connection, CEO gender, and firm performance. *Journal of Corporate Finance*, 71, Article 101918.
- Tang, T. T. (2009). Information asymmetry and firms' credit market access: Evidence from Moody's credit rating format refinement. *Journal of Financial Economics*, 93(2), 325–351.

- Tsoukas, S. (2011). Firm survival and financial development: Evidence from a panel of emerging Asian economies. *Journal of Banking & Finance*, 35(7), 1736–1752.
- Verheul, I., & Thurik, R. (2001). Start-Up capital: "Does gender matter?". *Small Business Economics*, 16, 329–346.
- Vos, E., Yeh, A. J.-Y., Carter, S., & Tagg, S. (2009). The happy story of small business financing. *Journal of Banking & Finance*, 31(9), 2648–2672.
- Wald, J. K. (1999). How firm characteristics affect capital structure: An international comparison. *Journal of Financial Research*, 22(2), 161–187.
- Wezel, F. C., Cattani, G., & Pennings, J. M. (2006). Competitive implications of interfirm mobility. *Organization Science*, 17(6), 677–775.
- Whited, T. M. (2006). External finance constraints and the intertemporal pattern of intermittent investment. *Journal of Financial Economics*, 81(3), 467–502.
- Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics*, 126(1), 25–51.
- Younge, K. A., Tong, T. W., & Fleming, L. (2015). How anticipated employee mobility affects acquisition likelihood: Evidence from a natural experiment. *Strategic Management Journal*, 36(5), 686–708.